In connection with the previously announced business combination between Athena Technology Acquisition Corp. ("Athena") and Heliogen, Inc. ("Heliogen"), the following presentation was made on September 30, 2021. A transcript of the presentation is being filed herewith as a written communication pursuant to Rule 425 under the Securities Act (17 CFR 230.425).

Caldwell Bailey:
Good morning, everyone, and welcome to Heliogen's Analyst's Day. I'm Caldwell Bailey from ICR, and I'm pleased to be joined today by members of the Heliogen Executive Team. In terms of format for today, the first half of the event will include prepared remarks from the team, and we've reserved the second half of the event for Q&A. We'd ask that you wait until this point to ask any questions, and we'll give you instructions later in the call on how to do so. As a reminder, today's event is being recorded, so please mute your lines when not speaking.

Caldwell Bailey:
Before we kick things off, just a few brief disclosures. This call may contain forward-looking statements, including, but not limited to, Heliogen and Athena Technology Acquisition Corporation's expectations or predictions on financial and business performance and conditions, product development and performance, and expectations or assumptions in consummating the business combination between the parties.

Caldwell Bailey:
Forward-looking statements are inherently subject to risks, uncertainties, and assumptions, and they are not guarantees of performance. I encourage you to read the current report on Form 8-K that will be filed today at ATHN's filing with the SEC for a discussion of the risks that can affect the business combination, Heliogen's business, and the business of the combined company after completion of the proposed business combination. Athena and Heliogen are under no obligation and expressly disclaim any obligation to update, alter, or otherwise revise any forward-looking statements, whether as a result of new information, future events or otherwise, except as required by law.

Caldwell Bailey:
With that, I'd like to turn the call over to Mr. Bill Gross, CEO of Heliogen.

Bill Gross:
Thank you very much, Caldwell. I'm really excited to share Heliogen's mission with you today. Thank you all for attending. Heliogen is building industrial decarbonization by replacing fossil fuels with concentrated sunlight. I will take you through our technology. I will take you through how our product has strong differentiation. I'll explain to you how it works. I'll introduce you to members of our executive team. We'll talk about the business opportunity. I'll introduce you to our partner, Athena Technology Acquisition Corporation, and summarize. We'll give you plenty of time for questions at the end, and we really look forward to those.

Bill Gross:
Today, industry needs a new resource to power the energy transition, and that includes heat, power, and hydrogen. Solar energy is one of the most evenly distributed natural resources to solve that problem providing 10,000 times more than the planet uses. However, there are two problems with solar and most renewable energy. Solar and most renewable energy is extremely intermittent, and solar and most renewable energy is extremely difficult to transport. Heliogen's sunlight refinery product will solve these two fundamental problems.

Bill Gross:
Our aim is to produce near always available and transportable renewable energy and do it cost-effectively for our industrial customers. We have four fundamental insights that we feel set us apart. The first is that heavy industry is a very critical market for decarbonizing technologies and is currently very underserved. Also, renewable energy for heavy industry must be near constantly available and cost-effective. That's because heavy industry operates at 24/7, so they need power all day long, and heavy industry has a huge energy component and therefore they need it to be cost-effective if they're going to replace their current energy source with renewables.

Bill Gross:
The next insight we had was that AI and software and computation power can simplify and reduce both the hardware installation and maintenance costs. In other words, we can use new innovations in computation that have come about because of Moore's law, to make concentrated sunshine competitive with fossil fuels. And finally, another fundamental insight is that the only way to compete with fossil fuels is through high-volume manufacturing techniques. Those will enable reliability, scale, and we get learning curve cost reduction by using those techniques. We're building on these four key insights to decarbonize heavy industry, and we project that we'll create a profitable high-growth business.

Bill Gross:
Right now, there are many companies that pursue the residential and commercial solar market. There are also many companies that pursue the utility scale market. We feel there are very few companies that are pursuing industrial carbonization, and that is a wide-open opportunity. It can make a meaningful impact on climate change, but it can make a meaningful impact on meeting the targets that these companies have set.

Bill Gross:
Our key differentiator will be what I described earlier, near always available renewable energy. As all of you know, the peak of sunshine is at noon, but we need to deliver for our industrial customers power flat all day long. You'll hear how our unique technology allows us to do that exactly the way our customers need.

Bill Gross:
Our other fundamental insight was that more computation can now make smaller, better. The old belief in concentrated solar was that you would make your systems larger and larger and larger to try and become more economical. The new insight is that software actually makes smaller, better. Smaller was always better for optical performance, but there wasn't enough computation power or the algorithms or the AI or the computer vision to make that possible. We take advantage of that. We combine software and hardware to make this new system work. We basically use more bits, more software, so we can use fewer atoms. That allows us to be more competitive for our customers.

Bill Gross:
The final insight, scale and modularity, are key to driving down costs. We basically have reinvented concentrated solar to be modular and scalable. Concentrated solar has been around for more than 50 years, but they've always been one-off projects. They're large projects, custom designed for each installation. By building one modular five megawatt plant and replicating it, we can become more and more economical over time.

Bill Gross:
This plant that we build is about a sixth of a square mile that has a footprint of about 650 meters by 650 meters. It can produce five megawatts of electricity near continuously, or produce 850,000 kilograms of hydrogen per year in the same footprint, and then we can replicate this for however many of these our customers need. So for example, if a customer comes to us and says, I need a hundred megawatts, we don't go and re-engineer this five megawatt plant to be a new 100 megawatt plant, which is a new one-off. We sell them 20 of these identical modules. It's that modularity that gives us the scale. It's that modularity which gives us the cost reduction.

Bill Gross:
So now, let me tell you how that technology works. We invented a closed loop computer vision system to computer control of these mirrors. In the past, people have built large fields of mirrors that reflect sunlight to a central tower, but they all been purely mechanically driven, mechanically driven like with a clock motor or a telescope drive motor. Our unique innovation is to use cameras on the tower that look at the field and use real time optical feedback, not just mechanical stiffness, to point these mirrors. Well, what does that achieve? That makes them much less expensive to deploy, but it also makes them much more accurate. More accuracy means higher temperatures and higher efficiencies. Higher temperatures means lower cost storage. All those things lead to exactly what our customers need.

Bill Gross:
So what we do, we reflect the sunlight to the top of the tower. We generate very high temperatures in the solar receiver. In the past, concentrated solar maxed out in the 500 degrees centigrade range. We have achieved well over 1000 degrees centigrade, even over 1500 degrees centigrade. By achieving such high temperatures, it's a result of the optical feedback precision, but because of the high temperatures, we can store that energy very inexpensively in solid media. Solid media, rocks or gravel or sand or ceramic tiles. By storing thermal energy in solid media, we dramatically reduce the cost of storage. Storage is the critical element to meet industry customer's needs, and we make that very inexpensive and reliable with solid media.

Bill Gross:
We then use a heat exchanger to take the heat from the storage. This is an example of the storage down here, a tank that's insulated. We use a heat exchanger to take the thermal energy that we've stored and use it for whatever the customer needs. We can take that heat and make steam directly, if the customer needs that or heat. We also can take that heat and convert it to electricity by bringing it to a turbine, which we do with partners, or we can connect an optional electrolyzer to make hydrogen. You'll hear later how we have special competitive advantage to make hydrogen as well, because we have the high temperature in addition to electricity.

Bill Gross:
This shows some more about how we do this. Up on the tower, we have four cameras. These four cameras look at the entire field of mirrors. We have a system that looks at those, analyzes the images, and builds this closed loop system to send very precise signals to every mirror, to tell it how to point directly to the target. That's how we achieve that very high accuracy, very high temperature, and make the field at a lower cost because we're doing more of the tracking optically and less of it through mechanical stiffness.

Bill Gross:
This software-based, AI-based, closed loop tracking system is a critical invention. We have very good patent protection on this new invention. Here's an example of what that achieves. A former concentrated solar field has very, very large mirrors, which attract mechanically to a very large tower target. You can see the beams are all over this target, some of the beams even missing the target. Our system, with the four cameras around the tower, allows us to concentrate sunlight into a very small spot. This is only 18 inches diameter in our demonstration facility in Lancaster, California, about the size of the basketball hoop. So we can have very, very high precision because of this real time optical feedback.

Bill Gross:
Effectively, what we have done is used Moore's law to break this huge mirror into 100 smaller mirrors. These 100 smaller mirrors can be mass manufactured and controlled by software. It's much more like prefabricating these in a factory and deploying them like farming than building a large construction project in the field. And this really is possible because in 2015, the cost of sensors, the cost of image recognition, the cost of autonomy all dropped enough in price to make this innovation really possible for the first time. We have uniquely taken advantage of that.

Bill Gross:
We have reinvented concentrated solar with this modular repeatable scale and allows us to make a plant, which is much smaller and still very economical. It's about 100 times smaller in price, and in this case, 35 times smaller in size, which allows us to place this directly at a customer's facility. Many of our customers are mining companies, steel companies, cement companies that have land adjacent to their factories, so we can build this in a modular fashion right on their premises because the size is so modular and so flexible.

Bill Gross:
We have strong patent protection on a variety of these technologies, both on the optical system and the mechanical system. We have six patents already granted. We have 13 patents pending, and we are a widely diverse technology organization building this technology out so we have lots of capability to scale this with customers globally.

Bill Gross:
Fundamentally, to make green hydrogen and to make almost all of our customers profitable and to make hydrogen affordable, you need what's called a high capacity factor. That's to leverage the CapEx of whatever you're putting behind our plant. In this case, for making green hydrogen, to leverage the CapEx of the electrolyzer. An electrolyzer, which splits water into hydrogen and oxygen, needs energy, but it has an expense which needs to be leveraged all day long.

Bill Gross:
If you take fixed solar panels with a capacity factor of only about 20% and connect to an electrolyzer to make green hydrogen, the economics are not very good because the electrolyzer is only running for a few hours per day. You can increase that capacity factor by going to track solar panels with an average capacity factor of 27 and a half percent. But even still, that doesn't make green hydrogen affordable today with track PV panels. You can get even higher capacity factor with wind farms or offshore wind farms, but you can't get anywhere near the target capacity factors of Heliogen of 80% to 90%. We can achieve approximately 85% or higher capacity factor, depending on sunshine and location for our customers. That enables them to run near 24/7, but also enables them to make very cost-effective green hydrogen, and you'll hear more about that later in the presentation as well.

Bill Gross:
The industry needs green hydrogen and needs always available green power. This graph shows you on the X-axis, capacity factor, and the Y-axis, cost of electrons, and you can see there are ways to get very low-cost electronic today from green electricity, but at very low capacity factor. We are very unique in that we can have low-cost electrons that are 100% green and very high capacity factor. About the only other renewable option that could compete with this would be a waterfall because a waterfall is also near 24/7. However, waterfalls are not scalable. Waterfalls can't be located at will on our customer sites. So, we are effectively making something that has competitive power with that, but

it can be located in any good sunshine area.

Bill Gross:
The three fundamental things that we can offer customers, as I described earlier, are heat, which heavy industry needs, power or electricity, which almost all of industry needs, or fuel, green hydrogen. Many of our customers need one, two, or in some cases, all three of these things, and you'll hear more about that in our business opportunity later.

Bill Gross:
I am very proud of the team that we have assembled to pursue this opportunity. The team has a diverse experience and a lot of startup experience and large company experience, which you'll hear about in a moment, to tackle this opportunity. I'm honored to introduce you to a few members of our team. They'll tell you more about their expertise and what they're building in our company.

Bill Gross:
First, let me give you a little bit of background on myself. I've been starting companies all my life. I started a solar energy company when I was a teenager. I sold mail-order kits and plans for solar energy devices in the back of Popular Science magazine and Scientific American. I think that even got me into college, it paid my way through college because I sold those kits and plans over my high school years.

Bill Gross:
Then after graduating from college, I started a few software businesses. I learned everything about the software industry. I built one company that I sold to Lotus development. I built a second software company, an educational software company, that I sold to Vivendi. And then I started a technology incubator called Idealab in 1996. I have been so entrepreneurial all my life. I love to starting companies, and Idealab started more than 100 companies over the last 25 years. More than 50 of them have had successful IPOs and acquisitions. I have learned everything about startups, and in particular, about combining software and hardware to make businesses successful.

Bill Gross:
I've been using all of that experience to build Heliogen. I've learned about how to build the teams. I've learned about how to build a product market fit with customers, and I've learned about how to take companies all the way to large positive impact. So I'm so excited to be doing that at Heliogen and something that is so important to industry and to the world.

Bill Gross:
The team around me, I'm thrilled to introduce you to as well. First is Steve Schell. He's our CTO and Chief Engineer. I've known and worked with Steve Schell for more than 20 years. I hired Steve Schell right when he graduated from Caltech at the top of his class in mechanical engineering. I've worked with him on numerous different companies. Steve has an incredible background. Let me turn it over Steve, so we can share more about both his background, but what he's doing uniquely at Heliogen to make us successful.

Steve Schell:
Thank you, Bill, and good morning, everyone. As Bill mentioned, I'm Steve Schell. I'm the CTO and Chief Engineer here at Heliogen. I've been with the company since early 2018, and I'm responsible for all of our technology and product development. My background is in the development and delivery of high-quality innovative products spanning multiple industries. After studying mechanical engineering at Caltech, I began my career in the robotics industry where I focused on developing mechanical, electromechanical, and optoelectronic systems for a variety of mobile robots.

Steve Schell:
I've also spent time in 3D printing, including founding New Matter, where I served as the CEO and built a business from day one, developing and launching our patented and award-winning product, establishing manufacturing lines and supply chains in Asia, and creating sales and distribution channels.

Steve Schell:
My experience in the solar industry includes engineering leadership positions at East Solar and Amonix, in addition to my time here at Heliogen. In those roles, I was involved in the construction of the first power tower plant in the US and the then largest concentrating photovoltaic plant in the world, and I have experience with the design and production of two-axis solar trackers, like our heliostats, ranging in size from one square meter to over 300 square meters.

Steve Schell:
The leadership skills and industry knowledge that I've gained in this 20 years running engineering organizations, I believe positions me very well to successfully lead Heliogen's technology and product development teams, which I'll discuss a bit more on the next slide.

Steve Schell:
As we've already heard today from Bill, Heliogen's approach to the design of our standard module is holistic and product-focused. To make our product competitive, high-performance, and scalable, we design and optimize all the key subsystems together as a single integrated whole. To support this approach, we built a team of exceptional and highly-experienced engineers in a wide range of specialties, allowing us to take technical ownership of any and all critical components in the plant.

Steve Schell:
Our capabilities include design of the heliostats and the heliostat fuel control systems, high-temperature solar receivers, and thermal energy storage, and supercritical carbon dioxide power cycles, as well as systems engineering, modeling, and optimization. By building out our internal expertise in each of these areas, we can ensure that each system or component is designed to optimally balance the competing factors, cost, performance, and reliability, and we can iterate and improve on the design much faster than if we relied more heavily on vendors or other third parties.

Steve Schell:
Working very closely with my engineering team is our exceptional production organization led by my colleague, Andy Lambert, who will introduce himself next.

Andy Lambert:
Thank you, Steve. Good morning, everyone, and thanks for joining us. My name is Andy Lambert. I'm really relatively new to the Heliogen team as SVP for Production and Supply Chain. Having spent most of my career previously in very dynamic, flexible, and disruptive technology environments and companies. After nine years military service, where I have the privilege to also be part of the Harrier Display Team, I cut my teeth with high-volume manufacturing leading production, supply chain, and reliability functions for BMW with both Land Rover and Mini products.

Andy Lambert:
My last nine years have, however, been at SpaceX, where I, again, led production supply chain and reliability functions, designing, developing, and scaling the operations in

support of rapid growth and innovation to disrupt that industry while contributing to the highest levels of reliability for human space flight. I believe those career experiences and associated achievements position me perfectly to contribute my best work ever to one of the world's greatest challenges in terms of our climate change, and in doing so, disrupt another industry and provide a better outlook for our future generations.

Andy Lambert:
So, let me tell you how I intend to do that. Any developing technology company needs to continue to learn and innovate the products and processes rapidly and reliably. My number one priority was to therefore build those capabilities and to ensure we measure our progress on a daily and weekly basis. Manufacturing solutions must fit the needs of our business. So in our situation, we'll use high levels of automation. We'll leverage the latest technology advancements and ensure our facilities have high flexibility and capability to scale quickly.

Andy Lambert:
That, of course, means that to minimize our exposure to the global supply chain challenges we are all hearing or reading about, we need a very thorough understanding of all the commodities we source in order to remain competitive and reliable. And we have to develop long-term strategic partnerships, fuel source our parts, and have the right amount of vertical integration. Where therefore for already in an advanced state of planning, as we're about to occupy our new manufacturing facility, local to us here in California. In fact, that building's the external picture to this slide.

Andy Lambert:
To provide some further insight into how things will take shape, this visual correctly shows the technologies already ordered to support final process development and pre-production builds ahead of our production ramp next year. Our capacity planning also ensures we have the ability to scale quickly and meet demand both domestically and globally. So to tell you more about that demand, let me now hand over to my colleague, Tom Doyle.

Tom Doyle:
Thank you, Andy. Good morning, everybody. My name is Tom Doyle, and I'd like to start by sharing my background with you as well. I've been in the industry 25 plus years. I spent the first half of my career living in Asia, developing utility scale energy projects. In 2006, I returned to the States to focus on the emerging renewable energy business. I accepted a position with Bright Source Energy as EVP of Commercial Execution. While at Bright Source, I secured 1500 megawatts of power purchase agreements and recruited and led the team that developed the $2.2 billion Ivanpah project in the Mojave desert, which at the time was the largest CSP project in the world.

Tom Doyle:
In 2009, I was approached by NRG to build their renewable energy business. At NRG, we invested $350 million of equity in Ivanpah and became the majority shareholder. We also focused on developing or acquiring PV solar, battery storage, and wind projects. And by 2014, we were the largest solar company and third largest wind company in the United States from an equity ownership perspective. We then took that company public in the form of a yieldco, which again was an industry first for a renewable energy company.

Tom Doyle:
I've now taken my 25 plus years of international and domestic energy industry experience to Heliogen, where I hold the title of Global Head of Project Development. In this role, I'm responsible for domestic and international project development, project finance, project management, and operations and maintenance.

Tom Doyle:
So now, I'd like to give you a feel for some of the progress that we're making in the areas that I am responsible for. Starting with domestic development, when I started developing renewable projects in the US over a decade ago, strategically located sites and electric transmission positions were critically important, and that certainly hasn't changed. What has changed is we now have developers also securing sites with highway access and water rights for future green hydrogen facilities, so there's even more competition for those valuable assets.

Tom Doyle:
Our development team is focused on locking up acreage under purchase options that are strategically located from either a highway or an electric transmission perspective. We then file system impact studies to better understand the electric transmission situation and/or we conduct groundwater studies to ensure water viability. When the results are attractive, we move forward with environmental due diligence to support our permit applications, prepare extensive plans of development, and ultimately work towards securing a conditional use permit to support project construction.

Tom Doyle:
On the asset optimization front, we've recruited an experienced project execution team to advance our existing project activity. Our team has established an excellent relationship with our customers, commercial and technical teams, as we refine the project scope and design. At our demonstration project in Lancaster, California, we've recruited a facility test engineer to lead the existing team of technicians in supporting ongoing R&D projects. We've installed our latest generation heliostats and associated equipment for ongoing testing, and we've upgraded the site infrastructure to support current and future technology development. And finally, we're focused on select international opportunities that we've extracted from a significant amount of inbound interests.

Tom Doyle:
Our team has-

Tom Doyle:
... from a significant amount of inbound interest. Our team has a solid understanding of the competitive landscape, whether it be thermal power, wind, PV, battery storage, and we're focusing on opportunities today where we will be displacing existing fossil fuel generating capacity that produces heat, steam or electricity at very high levelized cost of energy and high DNI markets such as Australia, Mexico or Chile. So with that, I'd like to now turn it back to Christie.

Christie Obiaya:
Thanks, Tom. Good morning everyone. I'm Christina Obiaya. I joined Heliogen as CFO earlier this year after spending the past 11 years at the global construction giant, Bechtel, where I was most recently the CFO and head of strategy for Bechtel Energy. And now at Heliogen, I'm excited to put to work my collective experiences across corporate finance, project finance, risk mitigation, technical fluency from my MIT engineering background and my boots on the ground construction and site experience on both oil and gas and solar projects. So let me now share on the next slide what we believe makes Heliogen such a compelling investment opportunity. First, Heliogen, as Bill mentioned, aims to provide heavy industry with a de-carbonization solution that really has not been available to date. That is a commercially viable way to get clean energy that's nearly always available, even when the sun isn't shining. And we plan to achieve that through the patented combination of artificial intelligence and mechanical engineering innovations that Bill and Steve have described.

Christie Obiaya:
Second, we have really strong market tailwinds in renewable energy and the ESG space. Analysts have estimated new CapEx spend in the range of 8.5 trillion for renewable energy between today and 2030 in order to meet the Paris Agreement carbon emissions reduction targets. And that $8.5 trillion number is based on the power sector alone. We're also providing solutions for hydrogen production, which is estimated to be at least 150 billion over that same timeframe, as well as behind the meter industrial heat. And this market outlook, as you've heard from Tom, is absolutely corroborated by the inbound engagement that our team has had with perspective customers thus far. Third, we believe we have a trajectory for strong cost competitiveness with alternative energy sources based on our unique design and our modular execution, which we believe will really amplify the benefits of economies of scale. Fourth, you've already heard from Bill about the strength of our team.

Christie Obiaya:
So I won't dwell on that other than to say, it's been incredible working with the folks that you've just heard from and I really can't imagine a better team to deliver on Heliogen's mission and to overcome any challenges that we encounter as we scale. Number five, when we look at our prospective sales pipeline, it's extremely diverse as it ranges from global oil and gas companies, to mining and metals companies, to steel and cement industry players. And from a geographical perspective, initially as Tom has described, we're focused on the US, but by 2026, we expect to expand to other areas that have strong solar resource such as Mexico, Chile and Australia. And then longer term beyond 2026, we'll evaluate the entry of parts of Africa and the Middle East. And so we're incredibly excited about the potential that Heliogen has to transform the world's energy production landscape.

Christie Obiaya:
I want to tell you now about some of our initial commercial relationships. I'll start with ArcelorMittal. We have a strategic relationship with Arcelor, where they have actually become an investor in Heliogen as we develop an agreement to deploy our technology to their steel facilities. Arcelor has announced a goal of decreasing their carbon emissions by 30% by 2030 as compared with 2018, and Heliogen looks forward to supporting them in achieving this goal. At the end of 2020, we were also selected through a competitive process to negotiate a $39 million grant award from the Department of Energy to be applied to one of our first commercial scale facilities. We're also engaged with a large global oil and gas producer based in Australia and Heliogen's first revenue is actually coming from progressing engineering services to design the first module at this company. This company has also announced aggressive targets toward decarbonizing and their strong interest in leveraging Heliogen's technology to do so.

Christie Obiaya:
Finally, we're developing a scope to build a module for industrial heat with Rio Tinto at one of their mining facilities in Boron, California. Rio Tinto has themselves announced plans to reduce their carbon intensity by 30% and their absolute emissions by 15% during this decade, and they have described their intent that our single module initial project with them in Boron, California will be the first of many commercial scale modules that are deployed to their facilities to help them achieve their de-carbonization goals. And so as you can tell, each of these entities in the top row have announced commitments to carbon reduction mandates, and that is very representative of our overall pipeline of prospective customers. Looking at the bottom of the page, we've also established partnerships with members of the supply chain. One that we recently announced is Bloom Energy who we're partnering with to deliver clean hydrogen more economically.

Christie Obiaya:
Bloom has developed a solid oxide electrolyzer that will take advantage of Heliogen's unique ability to provide clean heat and clean power combined. So now let's shifts to Heliogen's economics and how we actually plan to make money. We will have two main business models. Our first business model is building turnkey projects, which utilize Heliogen's technology. Under that model, we sign contracts with customers to build an entire turnkey facility, which can be however many modules a customer will need for their desired energy output. So if they want a hundred megawatt project, we say a hundred megawatts divided by our five megawatt modules, so they have about 20 modules on their site. So we have the overall contract for the design and build up for the facility, including the heliostat field, the tower, storage, control system, power block and electrolyzer when applicable.

Christie Obiaya:
Heliogen does not intend to directly manage and hire the construction craft. We're partnering with top-notch EPC companies for that aspect and our focus will be really on deploying our technology and focusing on our core business. Our second business model is to serve as a supplier of heliostat and control system technology and equipment without being responsible for the full construction. Those two business models represent our primary sources of revenue. In both of those models, we expect three additional smaller sources of revenue from project development as you heard from Tom, from front end engineering services, which Steve's team will lead, and from O&M services after plant is put into operation we've conservatively assumed no material profit contribution from those three services, but we provide them to support the owner operator in getting the project deployed and supporting the project through its life cycle, and we do expect benefits to be realized by both the owner and by Heliogen through being able to do things like drop in software upgrades during the O&M phase to improve project output, which is a possibility, and also to do things like cybersecurity upgrades for the customer.

Christie Obiaya:
Ultimately, we see the potential to shift into a pure license or type role where we will license our IP to EPC companies and owner operators, and provide some nominal engineering support without playing a major role in the physical deployment. But we don't assume that we'll take that approach prior to 2026 and so that's not reflected in our financials. Earlier, Bill described our three product offerings of HelioHeat, HelioPower and HelioFuel. And I wanted to mention that we expect our first few projects to include one HelioHeat project, which I mentioned is Rio Tinto. But after that, our projections assume that we'll have a split of approximately 75% HelioPower and 25% HelioFuel or hydrogen, as you can see in the chart on the right, which shows our incremental modules installed each year over time. We are still seeing a lot of customer interest in HelioHeat so that's not to say that we're not willing to continue growing that market segment, but it really just offers an alternative or supplement to what we're showing here in our forecast.

Christie Obiaya:
Regarding our first business model where we build a turnkey facility, we sometimes get questions about how revenue is earned in that model. And so on the next slide, I want to spend a moment shedding light on that. We can view a facility as having three phases of a life cycle. In the first phase when the project is under development, that's when early engineering work takes place, such as assessing the viability of a project location, the local solar resource, how the modules will be laid out on the site and the estimated price for delivering the completed project. And then once a customer decides to move forward, we execute the contract to build the project and the total price amount will go into our revenue backlog. Then we progressively earn and recognize that revenue over the duration of building the project on a percentage of completion basis. And so for an example, hypothetical hundred million dollar total project, when we first signed the contract, we haven't earned any revenue yet.

Christie Obiaya:
But let's say that over the course of that first year, we incur the first 75% of the total estimated project cost and then that means for that year, our P&L, which shows 75 million in earned revenue attributable to that project. Once the project is complete, it moves into the O&M phase under a recurring revenue services contract. Now, moving on to our next slide on the financial forecast, as mentioned earlier, we expect our first three commercial scale towers to be installed in 2023 and those will be deployed as single modules on three different project sites. After building our first several projects, we expect to have a strong growth profile and from 2024 through 2026, we expect to scale up the number of five megawatt modules that are deployed per project. By the time we get to 2026, we expect to be averaging over 20 modules per project. And that's why you see that on the top row of the table, we have a high ramp up of new modules installed each year, but really it's not a huge ramp up in terms of the number of discreet projects for

customers.

Christie Obiaya:
Based on this trajectory, we expect to start generating free cash flow in 2025 and we expect to grow revenue to 2.4 billion in 2026, with 800 million in EBITDA. The way that we expect to achieve those profits is by driving down costs over time. There are three places that we expect to derive cost reduction. The first is from economies of scale, because as I mentioned, our initial projects are one-off single modules. And to really get the benefits of the repetition that is enabled by our modular approach, we are going to leverage the fact that we will be deploying multiple modules, many modules per project. And so that will bring us economies of scale. Buying power is the second place that we expect to derive cost reduction because of course, when you're buying 10 electrolyzers, that works much better from a procurement standpoint than just buying one. And then the third source is production efficiencies, which you heard a little bit about from Andy as we drive down the cost learning curve.

Christie Obiaya:
One thing I want to mention is that we do not intend to own and operate these plans. We're not in the business of selling the heat or power or fuel or taking title of the underlying commodity. Those assets that we're building will stay on the owner operators balance sheet. And so that helps us be relatively capital light and we're also fortunate and deliberate about not having debt on our balance sheet. So now let me tell you about a few of the potential upside and optionality opportunities relative to our forecast on the next slide. I mentioned earlier that our forecast assumes that most of our revenue comes from two of our three market segment or product offerings. And so industrial heat, which is the third provides an upside or alternative source of revenue. In addition to that, our forecast excludes the number of levers that provide further potential or optionality. Other than the US investment tax credit, we've not built in government mandates or subsidies.

Christie Obiaya:
Our model also does not rely on assuming a carbon tax, but in fact, some of our oil and gas customers have shared that they actually apply carbon tax internally when making capital budgeting decisions, which really [inaudible 00:40:27] us and I think reinforces how much tailwinds we have in this space. Our forecast is also based on two business models, as I mentioned. And so the benefits of licensing, which would help us scale more quickly and deliver enhanced margins on a smaller revenue pool will bring us greater quality of profit, but is not actually built into our forecast projections that you saw on the prior slide. And so overall, we believe that our strong projected economics are underpinned by a robust model that has several sources of upside and optionality that are really driven by Heliogen's differentiators. Moving on to the next slide, we're currently on track to becoming publicly traded by the end of this year by merging with the special purpose acquisition company, Athena Technology Acquisition Corp, which is led by an incredible team of female founders led by Phyllis Newhouse and Isabelle Freidheim.

Christie Obiaya:
Let me give you an overview of the merger transaction. Once Heliogen combines with Athena, we would be listed on the New York Stock Exchange under the ticker HLGN, with the merger expected to occur by the end of this year. We expect up to 415 million in total cash proceeds and up to 385 million of net cash proceeds, assuming no redemptions. The proceeds will be used for CapEx to build out our heliostat manufacturing facility, for R&D spending to focus on maintaining our competitive edge and continuing to design and test improvements and cost reductions in the next generation heliostat, as Steve told you about, we'll be using it to grow our talent as we scale up and progress commercial readiness, and to put cash on our balance sheet, because all of these tier one companies who are looking to do business with us will be expecting us to have some substance on our balance sheets so that we can ultimately be able to backstop the performance guarantees that we expect to be able to provide as we move forward.

Christie Obiaya:
We are excited to put the merger proceeds to work toward achieving the outlook that I just described. And we're so fortunate to be partnered with Phyllis and the Athena team on this journey. And I'm thrilled now to hand it over to Phyllis to tell you a bit more about Athena before Bill closes the presentation.

Phyllis Newhouse:
Thank you, Christie and Bill and team. So I want to tell you a little bit about my background and about Athena and why we chose Heliogen. But before I say that, I wanted to say, this is one hell of an impressive team. If you look at the company as a whole, it's just one impressive company. And so we're delighted and overjoyed to be a part of this journey with Heliogen. Athena is a $250 million spec that's all women led by me and Isabelle Freidheim. We started on this journey and we were looking for a company. We had very strict criteria. We looked at over a dozen companies with strict criteria, as I said, and here's what we were looking for. We were looking for a company that was disruptive in the industry, that was innovative, that had a scalable solution, that also had cyber hardness. We were looking for a team that had strong technical capabilities. We were looking for a leader that had a vision, and that was closely aligned with what Athena was looking for, diversity and inclusion as well.

Phyllis Newhouse:
And so in our spec, we had women that scaled from all backgrounds, from private equity to venture, to cyber, to some of the strongest technical capabilities out there and expertise. And we wanted to merge with a company that we knew, that we could deploy our expertise as well. We could come from as founders, as operators, as creators, job creators out of the energy space and we had our own, again, strong technical capabilities as well. So merging with Heliogen gave us an opportunity to deploy that. As we started to look at if all the boxes were checked with Heliogen, we decided this was a company that we wanted to do the business combination with. So we took it a step further. We brought into some of the top tier one firms to help us do the due diligence on Heliogen, and EY came in as our due diligence partner who brought in several tech firms. Some people say we did overdue diligence, but we wanted to make sure that day one, that Heliogen was public ready, and they are.

Phyllis Newhouse:
And we're happy to say that as we did our due diligence and we went out and we did a site visit, we had the opportunity to talk to all the leaders that you've heard from today, and also talk to people in the organization. And what we found that the culture itself alone is definitely ready to be that publicly traded company. So we're excited about the partnership. I'll share my own personal views on the company. As I got a chance to talk to Bill Gross and his team, I can say out of all the leaders that I've had the opportunity to lead with and be on a journey with, I'm more excited to be a part of Bill Gross's team and to be able to do this with him. He's one heck of a leader, one heck of a vision, and I just know that this is just going to be a great company of the future. And not just of the future, but changing lives and how we see the future in terms of renewable energy. So thank you.

Bill Gross:
Thank you very much, Phyllis. It's really an honor to work with you and we're honored to be working with Athena Technology Acquisition Corp. As Phyllis said, this really was a match made in heaven. The whole team at Athena has added so much value to our company already. The expertise that they brought to us to make us a stronger company has been unmatched. Phyllis will be joining the board with me. We'll be working on this together to really build out this opportunity to capture this full potential. So excited to be working with you, Phyllis, and thank you very much for your confidence in us. To quickly summarize, and then we'd love to take questions from you, we are working to be the leading technology provider, enabling industrial de-carbonization. Industrial carbonization is both a huge problem and an enormous opportunity. There's staggering demand for this right now. There's trillions of dollars of spend this decade, as Christie told you and it's a really, really important opportunity.

Bill Gross:
Our technology is superior for meeting this customer demand. Our technology is patented and combined software, hardware, and our know-how to really build a important

company that will enable us to also realize superior expected margins, as you heard from Christie. Our team is very strong, very experienced, capable of seizing this, and we really welcome you to join us in reducing climate change through this industrial de-carbonization mission. So thank you so much for listening to us. We're really happy to answer any questions you have on any front. Thank you again.

Caldwell Bailey:
Thanks, Bill. We'd now like to kick off the question and answer session. If you'd like to ask a question, please indicate so by selecting the raise hand feature on the bottom right of your Zoom window. If you don't see the button. you can also press ALT Y to raise your hand. If you're unable to do so for any reason, please type question in the chat feature. For those dialed in by phone, you can raise your hand by pressing star nine, and we'll identify you by the last four digits of your phone number. We will aim to take all questions in the order received. Before asking your question, please make sure you are un-muted and I will identify your firm and affiliation. Our first question comes Pavel Molchanov from Raymond James. Please go ahead.

Pavel Molchanov:
Hey, good morning everybody. Thanks for hosting this meeting. Let me start off by asking about cost reduction. When we look at the slides, and this was also in the original spec announcement slides showing volume of modules installed per year versus revenue per year, kind of the implied numbers suggests something like $60 million, maybe 70 million of module revenue in the beginning of commercialization. And then by the end of your targets, that number is more like 25 million per module. First of all, can you just confirm that those are the kind of pricing targets that you have in mind, and along those lines, what is the roadmap to enable the cost reduction that would allow you to reduce the price to customers accordingly?

Christie Obiaya:
Hi, Pavel. Good to see you. I'll take the first half of that question and then I'll hand it to Andy to take the second half of the question. On the first half of your question, for revenue in the first couple of years and kind of looking at your economics on the per module revenue, there's a little bit of overlap as you saw from the business model slide in terms of how revenue is earned because since it's earned over more than one calendar year, it's not quite as simple to take the drop down of one year's worth of revenue and divide by the number of modules that are completed in that year, since there will have been revenue earned in the prior year likely on many of those projects. But largely, the kind of costs path downward that you talked about is largely consistent with what we're looking at. One clarification that I'll make is that in our first few years, our first couple of modules are using the first business model that I talked about of having us take responsibility for the full project build out.

Christie Obiaya:
And by 2026, we'll actually be in the mix of both building and taking responsibility for the full project and also selling the technology and heliostats and control systems. And so actually our per module revenue for those projects will be lower because we're not taking the construction side of the facility. And so that's why in part, it looks like coming across as a lower revenue per module, but actually it's also because of the mix of the business models that we're using. And then in terms of how are we going to get there in delivering the profitability that we talked about for 2026, it's a combination of the economies of scale, the buying power and the cost reductions. And let me, let Andy give you some more insight into how exactly we plan to get there.

Andy Lambert:
Thanks, Christie. Pavel, in a manufacturing environment, when we're building one-off systems, we're naturally leveraging speed, which unfortunately also leads to higher costs in terms of realization of those projects. As we move forward, we get into higher volume techniques where we're doing repetitive buys, we're leveraging our procurement power to buy at much greater quantities and that generates very significant cost reductions in [inaudible 00:51:58] price, as well as obviously leveraging productivity gains from our knowledge and learning from one building to another. In automotive, I would regularly deliver double digit productivity gains when introducing new vehicles from one generation to another and consistently over three to five year timeframes. So this is something that I quite frankly believe is easy to do in a large high volume manufacturing environment.

Pavel Molchanov:
That's helpful. Let me follow up by asking about the policy context for all lists. You referenced that you're not modeling hypothetical carbon tax, perfectly reasonable. You are assuming that the investment tax credit in the US remains kind of status quo. Are there any jurisdictions in terms of your addressable market, the high irradiation markets, where there are specific incentives to decarbonize, as you said at the very beginning, the industrial supply chain rather than utilities or rooftops where governments have historically been focused?

Christie Obiaya:
That's an interesting question. I'm aware that there's currently legislation being drafted to support potential changes and additions under the current administration in the US for how the existing incentives and things like the loan guarantee program will be extended. I'm not sure if any of them specifically go towards heavy industry, but I will say that in different countries that we have been participating with in terms of our prospective customers, they are being held accountable by their stakeholders. And we've seen a lot of activist participation by investors and shareholders in oil and gas companies. We see some of that same thing in terms of ESG for mining and metals companies. And so we believe that a lot of what is compelling the shift in the trend that we see is actually coming from customers and stakeholders, and not necessarily driven by policy.

Christie Obiaya:
But we absolutely will be positioned to take advantage of any subsidies or heavy industry specific benefits that are delivered in the areas with strong solar resource that we're looking at.

Pavel Molchanov:
And lastly, this is kind of a more narrowly focused question, I suppose, about Rio Tinto. You talked about the collaboration in California at the Boron facility. When do you expect transferring or converting that early stage partnership into a firm revenue generating contract? When is that supposed to be signed, sealed and delivered, so to speak?

Christie Obiaya:
We don't have a particular date set for when we expect that kind of larger scale contract to be underway. The strong interest remains by both parties and we're actively working on negotiating the final contract for that first full facility build. And so as we progress that and learn more, I know we'll be excited to share that with the market.

Pavel Molchanov:
Very good. Thank you.

Caldwell Bailey:
Thank you, Pavel. I'd just like to remind everyone that if you would like to ask a question, please use the raise hand feature on Zoom, or you can press ALT Y if you can't find the button. Our next question comes from Rob Wertheimer of Melius Research- Rob, please go ahead.

Rob Wertheimer:
Hi everyone. Thanks for presentation. It's very exciting, what you've put together. I had a couple ones, and maybe the first one is a little direct. But, Bill, you talked about how software and computing power are enabling technology for this to actually work. Software and licensing fees of that kind are not exactly in the revenue model. I'm just curious what the thought process was. Maybe it's customer conversations, maybe it's how the industry is work and power. I understand some of that. But is it possible that you'll ever have a calibration revenue line, if you see what I mean, or something of the sort? And then I have more fundamental questions after.

Bill Gross:
One of the things that we're very excited about because of the large software component, is that we can make the equivalent of over-the-air software updates that can make the plant run better. It's a little bit like Tesla can offer an over-the-air software update to take that piece of hardware and give it new functionality, including even more mileage, by running the air conditioning system more efficiently, by running the regenerative breaking differently. So you can take hardware and make it smarter over time with new software. So we definitely plan to continue to evolve the software to be able to do that.

Bill Gross:
So one is improvements, like you said. But the other is what Christie alluded to earlier, that someday, currently not forecasted before 2026, but as soon as possible, we would love to license our software and technology to other people to deploy this at even faster scale than we can. For right now, we're supervising the building of all of our plants. We're deeply involved in that, but that's additional upside for us down the road. But the software component not only allows us to make those kinds of changes, which provide additional value, but also allow us to drive down the cost, because we can shift more of the cost of the product from atoms to bits, and the bits cost a lot to develop. Once you develop them, you can duplicate them for virtually zero cost to goods. So, that's our direction.

Rob Wertheimer:
And then a couple other questions. I recognize the attractiveness of the industrial space and maybe the uniqueness of the solution you can provide there. It seems like you also have a broader vision. I'd love to hear your thoughts on the skill availability of the technology, just to be a general sort of provider of electricity and/or power through hydrogen or whatever. The cost curve of you versus portable tech for the signing material content, is there a true potential to be a primary source of power for the world in addition to decarbonizing the industrial world and some of the processes there.

Rob Wertheimer:
And finally, I'm sorry for that, but does it work best when you're doing electricity and heat and/or hydrogen, or, I don't know if there is an efficiency gain or loss when you think about that? So I'd understand where the technology fits.

Bill Gross:
Great questions. We definitely can provide utility scale power at a very economical price in the long term. Right now, the lowest hanging fruit, our industrial customers, because they pay the markup from the utility. The utility would be equivalent to like wholesale, and the customers more like buying the product, electricity or power, at retail. So by locating on the premises of our industrial customers, we avoid that markup, we avoid transmission charges, transmission losses, and so on. However, as we drive the price down, utility business is a very large opportunity for us for sure.

Bill Gross:
You also asked about combining heat and power, or combining heat, power, and hydrogen, and that is very cost effective. Some of our customers do want to combine heat and power, and that is extremely economical because if you're already producing heat at a given location, you can use a lot of that in addition to the electricity you're producing to get higher overall efficiency on the delivery. And that's something we didn't spend enough time on, either on how we even do that with the Bloom electrolyzer.

Bill Gross:
So let me tell you how we have a competitive advantage because of heat and power with Bloom as just one example. It takes a fixed amount, about 54 kilowatt hours of electricity, to split water, to make a kilogram of hydrogen. That's physics and chemistry. You can't change that. But that 54 kilowatt hours doesn't have to be all electrons. It can be partially heat and partially electrons. Because we have so much heat available. We can provide a Bloom electrolyzer, which operates at high temperature, partial energy in the form of heat, steam, and partial in the form of electricity. But that can be 30% less electricity than other competitive electrolyzers, which gives us a significant advantage. Because when you have heat and you have to convert to electricity, you go through an efficiency of conversion process of somewhere between 33 and 50%. If you can use the heat directly, you don't have that conversion process. So, any customer who needs heat and electricity, or any electrolyzer that can use heat and electricity, we have a significant competitive advantage for.

Rob Wertheimer:
Thank you. I will get back in line. Thank you.

Caldwell Bailey:
Thanks Rob. This is a reminder. Please use the raised hand feature on zoom to get in line for questions, or press Alt Y. Our next question comes from Heidi Hauch of Barclays. Please go ahead.

Heidi Hauch:
Good morning, and thanks for taking my question. So just first one. On the variability of capacity factors, noting how your capacity factor is 85%, obviously very high and assisted by software. But given that solar radiance is different across regions, how do you see this 85% capacity factor bearing as you deploy more globally or as seasonality kicks in? And then, where would you have a worst value proposition globally for deploying this technology?

Bill Gross:
Great question. Well, first of all, our best opportunities are where the sunshine is best for sure, except that, that's combined with what's the cost of the fuel that we're replacing. So of course we want to go where it's sunniest, where the direct normal insulation is the highest, because that would lead to better economics. However, there are some places, some of our customers, Tom is working with them, where maybe diesel is being trucked in 350 miles, or the fuel is very expensive, or now maybe the DNI, the direct normal insulation, is not very good in Southern Europe, but natural gas prices are up to $15 per MBDU. So all of a sudden we become extremely competitive in regions where maybe we wouldn't have otherwise because of what we're competing against.

Bill Gross:
But to your first question about capacity factor. The capacity factor is something that we set by over sizing the solar field and by over sizing the storage. So we can choose the capacity factor in any region. It's easier to achieve a high capacity factor in a high sunshine region, but it's possible to achieve any capacity factor through more expense. So what we do with our customers is we find out what capacity factor they need and we can size our solar field. It's called solar multiple, how much multiplier over a one times solar multiple you have, and size the storage to meet their needs. There's typically a point of the lowest levelized cost of energy, whether that's heat, electricity, or hydrogen, that

occurs at a particular capacity factor. But a customer can choose to be off of that point if they have some other needs.

Bill Gross:
So for example, in one particular sunshine region, the absolute lowest levelized cost of energy might occur at 78% capacity factor. But if the customer wants 85, we can oversize the field a little further and oversize the storage a little further and achieve that capacity factor, albeit at a slightly higher expense. So we work with our customers to find out what their needs are, and we can size the field appropriately for whatever the sunshine is in that region.

Heidi Hauch:
Great. That's super helpful. Thank you. And then secondly, given the issues that Legacy CSP has had with maintenance [inaudible 01:04:40], or partial shutdowns, what is your exposure to that? And what kind of expenses are you projecting going forward in having to service this CSP technology?

Bill Gross:
We have worked very hard to design our system to avoid some of those challenges. I'll tell you about a few of them, and I'll turn it over to Andy to tell you about some of the others. One of the challenges that legacy CSP has had is the maintenance of the large heliostats, because it requires cranes and other equipment to come out to service them. Making our units small and replaceable and modular really changes that.

Bill Gross:
Another challenge with Legacy CSP has been problems with malt and salt. Malt and salt has been used as a storage medium in the past, and molten salt freezes. So molten salt must be kept liquid at all times through heat tracing of all the pipes. If that tracing ever fails, the molten salt can ruin the pipes and ruin the pumps and cause great, great challenges. We avoid all of that by using solid media for our storage, by using rocks or sand, particles or ceramic. We don't have any of that problem of pumping around molten salt or the challenge of freezing. So we've worked very hard to avoid those prior challenges. But then most of all, on the ongoing maintenance, were you also using Moore's law and computation to do new things in that area too? And I'll let Andy talk to you about some of that.

Andy Lambert:
Yeah. So just like we're deploying automation of actual manufacturing processes, we're also in heavy stages of development for doing exactly the same fulfilled maintenance. So for continued high performance, we need to ensure our mirrors are clean so the automated process of cleaning is in late stages of development, and couple that with autonomous technology. Then you can deploy these at night so that both the washing process and the movement of that vehicle doesn't take the manpower behind it. So we aim to couple all these latest technologies to make the servicing solution viable for our customers. But in addition, I mentioned that as well as having rapid prototyping capability, we also made sure we had rapid capability to do long range reliability testing. So we're already extensively testing all our sub-components, our systems, and assemblies. The absolute intent is for our devices to be maintenance free. Realistically therefore, the only time we should intervene with any of the products in the field is through an unexpected event or breakage that's caused by some external factor on those mirrors.

Bill Gross:
Thank you, Andy.

Caldwell Bailey:
Thanks very much. Again, a reminder. If you'd like to ask a question, please use the raise hand feature or press Alt Y. We've had one question come in from email. "We've heard about concentrated solar for a long time. The space has had its struggles. You've talked about how your approach is different through the use of artificial intelligence and closed loop systems. But can you give us some expansion on that topic? How does the closed loop system work, and just details around that?"

Bill Gross:
Yes. Concentrated solar in the past has used large mirrors that are almost the size of a tennis court, that require a huge mechanical structure to hold multiple facets of mirror, because you can't even make pieces of mirror that large. You have to hold those large facets of glass in precise alignment, which requires lots of steel, lots of welding in the field, lots of crane work, lots of foundation work, and lots of civil work to put in place. Our novel idea was to make a mirror with only one facet, so there was no large steel frame holding multiple facets in alignment. We make one facet that we can place essentially on a tripod on the ground, relatively inaccurately, without a big foundation, without a lot of civil work, and then we use software to make it point to precisely the right place. So it's the control system that enabled this reinvention of concentrated solar.

Bill Gross:
The idea of reflecting photons with mirrors to a single spot to make heat is incredibly powerful, but the engineering challenge to do it the way it was done in the past had many flaws. And it's only with computation that we were able to take a new look at it, and use this new vision system to make smaller single facet mirrors point more accurately than large civil field work constructed mirrors. So, that's really the fundamental difference. In addition to the increased accuracy, as you heard from Andy, it also allows us to drive down the price because now you can make these individual heliostats, these individual computer controlled facets in a factory by moving the mechanization to a factory from the manufacturing by hand in the field, you get the scale reduction in cost of almost everything in our life. Almost everything in our life, whether it's our iPhones or our cars, are all built on assembly lines. And we have taken concentrated solar and moved the majority of the production to an assembly line. And that's how we get the cost down. That's how we get the reliability up.

Caldwell Bailey:
Thanks. Thank you. Our next question, again an emailed question, comes from Chandni Challapa from Credit Suisse. He asks, 'Where are you sourcing your key materials from?"

Bill Gross:
I'll turn that over to Andy.

Andy Lambert:
Yeah, good question. Basically, we have sourced all the early prototype parts for the low volume manufacturing domestically, with a few from over cease. Naturally, as we start to competitively source, given the supply chain challenges, we're looking at all locations. We've not confirmed final supply from a specific vendor, but on a global footprint, you're talking about realistically glass and steel as the primary commodities, which are available in abundance. So now we'll finalize in the coming months, our decisions around which specific sources we are going from. Naturally, we're highly sensitive to tariff situations. So, that's factored into our final decision making. But as I mentioned, the primary commodities that we have in our products, these are easily sourced items. It's all about how we get the best transformation cost to the shape and size of our final piece parts that we iron out through those negotiations and final selection processes.

Andy Lambert:
Leveraging some of the processes equally, you'd recognize from automotive for high volume and high reliability, their key to ensuring that that supply is reliable over time and

that we've chosen also the right partners. So that's a key element we also have to go through between now and final selection, ensuring they truly do have the right capability to give us that reliable high output over a longer period of time.

Bill Gross:
I want to add one thing. Andy, thank you. You heard Andy say that our primary materials are glass and steel, and that's true. What's great about our system is we're taking commodity materials, widely available everywhere in the world, simple materials, and adding value to it through our design and our software. So we don't use any exotic materials. There's no silicon. There's no wafers. There's no wafer cutting. There's no exotic, rare earth metals. There's no cobalt or lithium or anything else like that. What we're essentially doing is something that's closer to farming. We're taking a very inexpensive material, spreading it out over a lot of land, using mechanical engineering expertise and software smarts to make those point to the right place, beaming the energy to a single spot. Where now that it's at a single spot, we can harness it very cost effectively. So the beauty of this is inexpensive, readily available materials enhanced by smart design and software.

Caldwell Bailey:
Thanks very much. Our next question comes from Aric Li of Bank of America. Please go ahead.

Aric Li:
Hey, thanks for taking the questions. Can you hear me?

Bill Gross:
Yes.

Aric Li:
Perfect. Yeah, just, one, I wanted to ask, given the specific focus on industrial decarbonization, could you just talk us through the specific process of converting that concentrated sunlight generated heat at the receiver? And two, you talked about heat that industrial customers could use, power, lastly, hydrogen. How do you think about the trade off if you're providing that heat directly to the steel manufacturing facilities? Does that reduce the amount of power or hydrogen you could produce? If you could just maybe frame this for us, even in the perspective of a project that's located at a steel manufacturing facility, that would be very helpful to understand.

Bill Gross:
Great. I'll turn that over to Steve to explain that to you.

Steve Schell:
Hi, good morning. And thanks for your question. So at the top of the tower where all of the concentrated sunlight from the UV tech field is focused, we have what we call a solar receiver. And the purpose of that receiver is to absorb that concentrated sunlight. And the intensity that we're typically operating at is anywhere from several hundred times to over a thousand times the intensity of sunlight on a clear day. So we have this very intense beam of light that's absorbed in that solar receiver. And what we do is we heat up the solid media for the thermal energy storage that Bill described. And again, depending on the temperature that's required for the customer application, this could be any of the solid media that Bill mentioned. Rocks, ceramic bricks, tiles, sand, et cetera. We store that hot solid media in an insulated vessel, in a very large tank at ground level. That allows us to maintain that heat like a thermal battery overnight.

Steve Schell:
And then again, depending on the application, whether it's steam or if the customer requires hot air, for example, we use a heat exchanger that transfers the heat from that hot solid into the processed fluid that is required for the customer application. Most commonly, this will be steam for a lot of the industrial process heat applications, such as what [inaudible 01:15:59]. This is a heat exchanger where feed water comes in. It acts a lot like a boiler, and the difference is that this boiler is being heated from that stored, concentrated sunlight, rather than a boiler that's being heated with a flame.

Steve Schell:
In power generation applications, this heat exchanger would actually draw that heat and use it to increase the temperature of carbon dioxide at very, very high pressures. So we use what's called a supercritical carbon dioxide Brayton cycle, which is a type of heat engine, sort of analogous to a steam turbine that you might see in a fossil fired power plant. But the difference is that these supercritical CO_2 cycles are thermodynamically extremely efficient when paired with the high temperature heat we can create with concentrated sunlight. So the benefit there is that we can get a very high thermal to electric conversion efficiency from that system, much higher than what we could achieve with something more traditional, like a steam turbine, at the scales that are relevant for our industrial customers. So again, depending on the application, there could be this heat exchanger to produce steam potentially hot air in some cases, or heat up this supercritical carbon dioxide.

Steve Schell:
And lastly, there can actually be multiple heat exchangers. As Bill mentioned, a lot of the economics and thermodynamic efficiencies are improved if we're providing both heat and power. So in that case, we may have, for example, a steam boiler and a supercritical carbon dioxide heat exchanger so that we can both produce the steam and electrical power that that customer needs.

Caldwell Bailey:
Thanks, Steve. We did have one another emailed question. "Can you talk a little bit about what the sales conversation looks like with customers and what you see as the biggest hurdle to adoption?"

Bill Gross:
Great. I'll turn that over to Tom for that.

Tom Doyle:
And I'm sorry, can you repeat the second half of that question?

Bill Gross:
Whoops.

Caldwell Bailey:
Can you talk a little bit about what the sales conversation looks like with customers, and what do you see as the biggest hurdle to adoption?

Tom Doyle:

What's interesting, and again, I've been in this space for decades, the sales conversation. I've never been a part of a technology where we had so much inbound interest. What's really driving that is the fact that this is really not a central station at CSP technology. This really is more, as Bill said, of a distributed CSP technology. And so we're uniquely positioned to have conversations with customers, particularly those in remote locations that have a strong desire, and in a lot of cases, corporate mandate to reduce their carbon footprint. So it's really about displacing existing fossil fuel generation. That's how the conversation starts. And we can creatively apply our technology to do that in a number of different ways. I think from an impediment perspective, it's simply that we're a new technology. And so we don't have a strong track record that we can point to of our technology having performed in multiple locations. But everybody that we have spoken with also appreciates that on the other side of our commercial demonstration project, there'll be significant interest going forward.

Caldwell Bailey:
Thanks, Tom. We do have a follow-up from Rob Wertheimer of Melius. Please go ahead.

Rob Wertheimer:
Hello again. Could you about the technical challenges of scaling up from the 400 [inaudible 01:19:49] to the 40,000, if I'm not mistaken? Are they all solved? And then, is your Lancaster facility running continuously? I don't know if there's issues with durability, metal fatigue, anything else? What are the challenges to proving out that the issue that Tom just raised with people knowing you're a new technology? [inaudible 01:20:16]

Bill Gross:
I'll turn it over to Steve to talk about the scale up from Lancaster. I'll say one thing first. The Lancaster facility we built is about a 35 meter deep field. And the one we'll be building for actual customers is 350 meters deep, so it's 10 times the radius. And everything that we did at Lancaster with the cameras, with the heliostats, it's building it larger. So it is a significantly larger field, but that next step, that will be the final size. That'll be the largest field we make. So, that's the thing that we're replicating continuously. Steve can talk to you more about the engineering challenges we're doing to address scaling that. And then of course, Andy is building the factory to manufacture it at that scale. Go ahead, Steve.

Steve Schell:
Thanks Bill. When I think about the process of scaling up our technology from Lancaster to our commercial projects, there's several different aspects to that scale-up. The engineering team is really focused on addressing each of those along the way to buy down as much of that risk as we can, before we go deploy these first commercial projects. So for example, the Heliostats themselves, it's really a question of replication. So you've heard quite a bit from my colleague Andy. It's about how do we produce a factory and a production system that's capable of manufacturing these heliostats and installing these heliostats in a replicable way. So, that is well understood at this point.

Steve Schell:
The control system is a different challenge. Okay, so you heard from Bill the way our computer vision based control system works. We've deployed that control system at Lancaster, and we've shown that we can very accurately control 400 heliostats. So the question is what happens when that field scales up to 40,000? And there's really two ways we address that. One is by identifying what are the key risks that could challenge this system? So for example, the distance to the furthest heliostat grows much larger, so the optics in the camera need to be able to see that heliostat adequately from that distance. So, for a risk like that, we'll set up a specific test where we actually have cameras looking at a heliostat, maybe just one or a small family of heliostats at that long baseline, so that we can validate that the optical system is working correctly.

Steve Schell:
Another risk there is computing performance. So how much computational power are we going to need as we scale up to larger numbers of heliostats. So for a situation like that, we've developed an emulator, where we can actually have one server that is simulating the behavior of an entire field of 40,000 heliostats or 50,000 heliostats, while another server is actually running the control system against that emulator as if it's a real field. So we don't necessarily need to build 40,000 heliostats in order to validate that our control system can computationally keep up with the demands for that large number of heliostats. So these are a couple of examples of the kind of scale up and risk mitigation tests that we do all the time. That's really what, in a large part, what keeps my team busy between now and these first projects, is identifying where these risks are and creating and executing targeted tests to mitigate them before we go to the customer site.

Rob Wertheimer:
I would've guessed melting the whole tower was your biggest concern. It didn't sound like that's where it started. Is there anything with actually capturing the heat? You mentioned a bunch of different media you can use to capture the heat. I don't know if you've solved the optimal solution or if there's different optimal solutions for different power outputs or situations?

Steve Schell:
Sure. Happy to follow on there. So we actually used the facility at Lancaster as an R and D platform on a very regular basis. And we're able to very quickly iterate on the solar receiver, different designs, different materials, different control strategies, by placing prototype scale receivers at the top of that tower and operating them. So this is a lot of what...

Steve Schell:
... that tower and operating them. This is a lot of what the activity is at Lancaster now. Initially, of course, it was important that we demonstrated the heliostats themselves and the control system. Now we've really shifted modes of how we operate that facility and use it more as a tool to validate the thermal systems.

Steve Schell:
Some of the other paths that we use to validate scale up on the thermal train. In some cases we can use alternative fuel sources to provide the heat so that we can validate some of the equipment at larger scale than what Lancaster can provide.

Steve Schell:
Then, finally, we can also partner with other research institutions. For example, Sandia National Laboratories has a research and development solar tower with about a six-megawatt thermal heliostat field. Where we can install prototype receivers at that tower and actually use their field, which has a higher capacity than what we have at Lancaster.

Steve Schell:
Again, it's a multi-pronged approach to identifying, for each piece of equipment we're developing, what are the risks as we scale up? How can we most efficiently target a test against those risks?

Rob Wertheimer:
Perfect. [Caldwell 01:25:07], feel free to cut me off. I had one or two more, and just cut me off if you want to jump to somebody else first. [Tom 01:25:12], I wonder if we could talk about, or maybe to all of you, the total addressable market and maybe the rings of addressable market that you have. I don't know if you can give us just a list of industries

and customers, just so we all have more concrete vision of steelmaking plants. Is it every steelmaking plant? Is it mini mills? Anyway, just talk about maybe the rings of targeted opportunity and how ... I don't know if you guys have done how big each of the addressable market spheres is within that. Thank you.

Tom Doyle:
I'll take that. The conversations we're having to date ... Actually, one important program that I think it's important everybody's aware of, there is the DOE Loan Guarantee Program in the United States. It's a program that effectively ... It's the reason the industry took off a decade ago. It's the reason Ivanpah moved forward, and Agua Caliente, and First Solar, and all those large projects that exist today.

Tom Doyle:
As part of that program, actually, the government is offering interest rates at less than 2%. There still is a very interesting US opportunity for us in both the hydrogen space and the electricity space, but internationally, the companies that are coming to us ... We can't name names, but one of them is a lithium mining company that's remotely located in Mexico. There's a tremendous amount of interest from steel companies.

Tom Doyle:
The other thing that we're seeing is, we're starting to see CSP-only RFPs in markets like Chile and Spain. Because, again, the challenge with PV and even PV with battery is it's very disruptive to the existing transmission facilities. You're seeing a lot of utilities now who are starting to look for CSP as more of that load-following product that they're ultimately looking for. It's a wide range of opportunity in conversations that we're currently having.

Rob Wertheimer:
Does steelmaking include all steelmaking? Does it include China, which is obviously massive on steel? It was in maybe one of your first markets. I'm just thinking about your breadth.

Tom Doyle:
Yes. China certainly is a market opportunity for steelmaking. But, again, the markets we're focused on right now are high DNI, and we're displacing remarkably high levelized cost of energy competitors. Again, the focus today has been on Australia, Mexico, and components of Chile.

Caldwell Bailey:
Thanks, Rob. We're going to toss it over to someone else. Our next question comes from Donovan Schafer of Roth. Please go ahead.

Donovan Schafer:
Hey, guys. I just wanted to ask, the design, the approach is very interesting, and that you talk about ... Correct me if I'm wrong on this, but it sounds like one of the key things for you, and part of the IP, and the technology, and everything, is you're using these optical sensors that are up on the tower so you can do a much smaller mirror. You can do this factory-like deployment of all these to reach the scalability, and all that stuff. Then that also allows you to get around civil work, meaningful size foundations and such.

Donovan Schafer:
That raises the question to me about ... Maybe this will be an easy pitch for you guys. Maybe you've tested this already. But what about wind? I know it's a smaller mirror, but if you're putting it on a smaller post, have you done wind testing? Is this rated for 100-mile-per-hour winds? 120? 140? Have you done that testing? I guess the other one would be, then, hail. Just those sort of general environmental factors, if you could speak to that.

Bill Gross:
I'm going to turn it over to Steve to tell you some details on that, because we do test for all of those things, but I just wanted to add one thing upfront. The wind gets better when you get smaller.

Bill Gross:
I'll get a little technical here. The wind load on an object goes up with a 1.65 power of its area, meaning it goes up more than linearly. We have an advantage by being small, significant advantage by being smaller. Yes, we have to test to all the wind codes, but that small size is a big factor in making it easier to control a smaller thing and hold it accurate than a larger thing. But, with that, let me turn it over to [Steve 01:29:49] to tell you about some of the testing that we do.

Steve Schell:
Sure. Thanks, [Bill 01:29:52]. First of all, it's a great question. You really hit the nail on the head. I often explain to newer employees who are joining the heliostat engineering team that, "You didn't realize it, but you're actually signing up to be a wind engineer, not a heliostat engineer." Wind really is one of the driving requirements that pushes us to design the heliostat the way we do.

Steve Schell:
You can imagine that, when we're looking for pointing accuracies on that heliostat that are a small fraction of a degree, maybe a tenth to a twentieth of a degree, understanding how the wind affects that system is extremely important. We've designed our heliostat to be, relative to its size, at least, extremely stiff, so that when the wind does blow, the deflections that we see on that heliostat are quite small.

Steve Schell:
I think it's also important to understand that this is a fairly common thing done in the solar tracker industry, is that the field will stow itself into a safe position at elevated wind speeds. Above a certain threshold of wind velocity, the heliostats will actually rotate themselves into a horizontal orientation. Once they're in that wind stow orientation, we design them and test them to survive typically a 90-mile-per-hour wind event. That requirement is really based on what's typical in the Southwest United States and Northern Mexico where some of our first projects are going to be. But, of course, we can make some minor modifications to the design if we ever need to install it in a location with potential for higher wind velocities than that.

Steve Schell:
Hail is also a requirement that we do test against. The test engineering team that gets to launch hail balls at mirrors is always having a lot of fun. I'll say it's a relatively straightforward thing to understand, with good industry standardized test protocols that we can test against to ensure that we survive hail.

Donovan Schafer:
Thank you. That answers my question. I think [Phil 01:31:40] has also got a question from our team, so I'll pass it on to him.

Bill Gross:

Donovan, first, you described our solution perfectly at the beginning of your question. Thank you. We got our idea across to you. We need you on our marketing team.

Donovan Schafer:
Thank you.

Phil:
Caldwell, you're on mute.

Caldwell Bailey:
Our next question comes from you, Phil, from Roth Capital.

Phil:
Okay. All right. Thanks. Hi, everybody. Thanks for taking my questions.

Phil:
First one is around your three-module target for 2023. Just was wondering when you need to have the commercial contract locked in by in order to meet that target. For example, can you contract in the same year and then recognize that revenue or meet that target of a module in 2023? Or is the lead time similar to traditional utility scale, where it could be a year, year and a half? We're coming on the end of '21. Really, we need to be looking for commercial contract announcements by mid '22, end of '22 at the latest. Thanks.

Bill Gross:
Yeah. I'll turn that over to Christie to tell you about that. Go ahead, Christie.

Christie Obiaya:
Yeah. Thanks, Bill. Yeah. Good question, Phil. We are in various stages of negotiation on the full contracts for our first couple of projects. As I mentioned earlier, we're currently executing on assigned contract for the front end engineering services for one of those projects. What we expect in terms of being able to sign and execute on the full scale projects is as follows.

Christie Obiaya:
In terms of when we get the full contract signed, it actually is possible to begin work against a full commercial scale facility by issuing things like a limited notice to proceed. even as we're in negotiations for the full contract, if it gets to a point where we and the customer work together and say, "We don't want to put 2023 at risk," it's absolutely possible to begin the long-lead-item work needed to maintain our dates, even if we haven't announced and signed off on the full, entire commercial scale facility.

Christie Obiaya:
There are definitely different creative ways to get started to enable us to achieve the timing that we're looking at. But, to answer the first part of your question, yes, we do expect to be announcing some commercial contracts for the full build in the coming months to support our 2023 timeline.

Phil:
Great. That's helpful. Thanks. Along the same lines, can you talk about the bankability requirements that lenders and others may need? It's a newish, or certainly a technology that is not as well established as crystalline silicon. Are you in that process now? How do you get through that process such that that becomes less of a hurdle?

Christie Obiaya:
Yeah. Great question, Phil. I'll take the first part of that question, and then I'd like Tom to maybe build further on my answer. In short, we're prioritizing, initially, customers who are able and willing to finance our first couple of projects on their balance sheet. We are not using project financing for the first couple of projects. We do ultimately expect that future customers will be looking to us to provide things like performance guarantees, and that kind of thing. We do expect to eventually have bankable contracts that support project financing. Maybe let me let Tom expand on that further.

Tom Doyle:
Yeah. Thanks, Christie. Yeah. That's a very good question, and obviously one that's on our mind. One of the things that we have started to do, and we started this early on, is we've started to engage with reinsurance companies. This is something that we had actually done when I was at NRG as well. We had reinsurance companies, or we had large corporates who would be willing to stand behind our technology with a performance guarantee.

Tom Doyle:
What that effectively looks like is a Fortune 10 equivalent balance sheet that is comfortable guaranteeing the performance of your project going forward. That, as Christie said, is a critical component of ultimately securing non-recourse project financing for these projects. The reinsurance company that we ultimately select is going to be working with us extensively through their due diligence effort as we bring our first commercial demonstration projects into commercial operation.

Phil:
Great. Thanks, Tom. That brings up another question around recourse versus non-recourse. In the first set of projects that you bring to market, do you think you'll be able to actually have non-recourse financing? Or do you think there might be the need for recourse financing and then, over time, as you demonstrate the reliability and the economics of the project, then you can, over time, migrate to non-recourse?

Tom Doyle:
Yeah. Again, a good question. As Christie pointed out, there, the first couple of projects are balance-sheet financed. We do anticipate ... The industry standard, as I'm sure you appreciate, is non-recourse project financing. We are going to be putting ourselves in a position where we can secure debt and bring a substantial amount of debt to our assets to boost the equity returns going forward.

Tom Doyle:
We absolutely plan on a combination of both, where we have cash customers who are willing to pay for the product. At the same time, we see an extensive opportunity to include these projects as part of what would be a traditional development effort that supports non-recourse project financing.

Phil:
Great. Thanks. I missed a bit at the beginning of the day, so apologies if that was already mentioned.

Phil:
One last question from me, and then I'll pass it on. It relates to unit economics, and, again, apologies if you guys talked about this earlier. Can we, at some point, see a unit economic model where you can lay out the assumptions for all the different revenue lines that might be generated for a project? What the baseline assumptions are, what the returns might be for the customers so we can get a sense for what the value proposition is for the different constituents, or at least for the different types of off takes.

Phil:
You talked through, I think in your deck here, a 5-cent-per-kilowatt-hour target for your, basically, cost for the power. Where do you guys stand now with that? Are you already at that 5 cent per kilowatt hour with your prototypes? If not, are you closer to 10? Over what timeframe do you think you get to that 5 cents per kilowatt hour? I know that's a lot. Really appreciate it.

Christie Obiaya:
Yeah. Sure, Phil, I'll take that one. In terms of our current cost, we're not currently at the 5-cents-a-kilowatt-hour cost at this time. The trajectory that we have to get there I know [Andy 01:39:18] has talked about earlier on this call, and hopefully you were able to hear some of that. I'll stick to how we can talk about our cost economics and unit economics.

Christie Obiaya:
We haven't publicly shared our current cost at this time. Frankly, our current cost is not representative, because our first couple of projects are the one-off, commercial-scale modules. Whereas we will be building groups of modules going forward, and that's really a great source of the economies of scale that will help us drive down our cost because of the modularity and the repeatability of our approach.

Christie Obiaya:
Talking about current cost is not that meaningful, but I think the intent behind your question is, can Heliogen deliver profitable projects that meet the customer needs? The reason we believe the answer is yes is for the reasons that Andy has described earlier, and where we think Heliogen's technology will be a competitive alternative to fossil fuels while still meeting customers' requirements. What we're assuming when we look at the out years in terms of the pricing per module that we assume, it's based on delivering for customers in the range of the 9% equity return. That's the basis of our assuming that we're going to be supporting what customer needs for their economic hurdles.

Phil:
Great. I appreciate that, for what it's worth. So far as you can share that economic model when you're at scale, that would be very helpful for investors. Thanks very much. I'll pass it on.

Christie Obiaya:
Thanks, Phil.

Caldwell Bailey:
Thanks. We do have an email follow-up from the Bank of America team. Could you talk about discussions with industrial customers on decarbonizing? Help us understand the level of demand. What timelines do you perceive potential industrial customers as targeting for decarbonization?

Christie Obiaya:
That's probably a question for me to pass off to Tom.

Tom Doyle:
Yeah. Thank you. In terms of timeline, frankly a lot of these conversations are about customers who wanted it yesterday. The demand right now is significant.

Tom Doyle:
The volume, again, I've mentioned this before, but I have actually never been a part of an organization where there was so much inbound interest from so many industrial customers to use our product. It's significant.

Tom Doyle:
The conversations we are having with folks now are more in the 2024 and beyond commercial operation date range. We're engaged with those folks today, and patiently waiting for our successful commercial demonstration projects to go online. Then we'll start filling the order book.

Caldwell Bailey:
Thanks, Tom. Then there was one more follow-up. How do you think about where hydrogen sits in meeting this industrial demand? Are you concerned at all about availability of hydrogen supply to meet that? How can you close that gap, if it exists?

Bill Gross:
Right now, almost all of the hydrogen made in the world today is made by splitting methane, taking CH4 and splitting hydrogen off of that, thus releasing CO2. That's because that's very inexpensive, but as the world wants to move to green hydrogen, which is needed for long-range transportation, or for steelmaking, or for lots of chemical processes, splitting hydrogen off of H2O, or water, is the green way to do that.

Bill Gross:
To do that needs green electrons, as I said earlier, near 24/7. The demand for it is extraordinary. The reason that it's not done today is just because it's more expensive than splitting it off of methane. Our goal to drive down the price below 5 cents for high-availability electricity is what makes that possible. In the out years, as we get the price of electricity down and the capacity factor up, we can produce hydrogen that's extremely competitive.

Caldwell Bailey:
Thanks. We have another follow-up from Rob Wertheimer of Melius Research. Please go ahead.

Rob Wertheimer:
Hi. Could you give us just a list of things to look into on competing technologies that could solve some of the needs in industrial? We understand maybe the energy landscape, but, maybe, Tom, maybe you bump into people when you're doing business quotes. What should we be looking at for competition?

Tom Doyle:
Do you want to take it, Bill? You want me to grab that?

Bill Gross:
No, go ahead.

Tom Doyle:
We've had ... As you can appreciate, you're not going to solve this problem with PV, battery storage, the wind. The customers need something that is much more constant than that. Frankly, one customer that we have been talking to south of the border, the only competition that exists for us to help them reduce their carbon footprint is biomass. You can have your own opinion of how ultimately green biomass ultimately is, but that is the only competition that we have seen today from a renewable perspective that can satisfy the customer's desire for steam and electricity.

Rob Wertheimer:
Maybe I was guessing at that response, but, Bill, anything else that you see on the horizon that you think you can see develop that is interesting?

Bill Gross:
Yeah. There was a question in the chat that relates to this as well. It was, could we speak more about other forms of storage, like all forms, and how we see those either as complimentary or as a competitive threat? Of all the kinds of storage, physics wise, there's only three. There's either chemical, like batteries, or thermal, like we do, or mechanical, like a dam, or gravity, or something like that.

Bill Gross:
Of those three, thermal is by far the most scalable and the least expensive. Batteries are absolutely necessary for greening our grid and for electrification of transportation. Batteries can probably only provide, cost effectively, several hours of storage for these large industrial customers. By us providing 16 hours of storage, we provide so much closer to what they need so much more economically.

Bill Gross:
As Tom said, fundamentally we're focused on customers who run all day long, all night long. Just having four hours of batteries to shift the energy from noon to the evening isn't enough. That might work for residential customer, that might work even for a commercial customer, and in some cases it can work a little bit for utility. But, for industrial customer who runs 24/7, they need 24/7.

Bill Gross:
I feel that our thermal storage solution is really an outlier for our customer needs. That's why we're so focused on these low cost materials, solid media, at high temperatures, thermal storage. It's probably an order of magnitude or even two orders of magnitude cheaper than chemical storage.

Bill Gross:
Batteries are absolutely going to come down in price. Batteries are being built at enormous scale. People are building gigafactories all over the world. I believe most of them will be consumed for electrification of transportation, because they're really good for cars. But for large, grid-scale storage, it's just very difficult to compete with our low cost 16 hours of storage.

Rob Wertheimer:
Perfect. I'll do one last one, if I may, Caldwell. Maybe this is for Andy. You talked about past achievement, and I understand it in scaling and reducing cost, et cetera. Can you give us just a sense of some of the major pathways that are out there? I don't know if steam turbines are optimized for five megawatts. I don't know if you're going to use the same size footprint, or if you're going to go a little bit bigger. Maybe just talk about the major pathways, and how much cost reduction and efficiency gains you anticipate over the next five to 10 years.

Andy Lambert:
Yeah. If you look at our current state, then we are assembling prototypes from not the optimal manufacturing process, if you take a metallic part. For quantities of scale and efficiencies, you'd seek to get that through a process such as stamping or casting. Whereas if you want it fast, you get a block of material and shave off of it and you get a machine. But, of course, you're paying the expense of doing that. In moving to the right scaled manufacturing processes, you are seeing orders of magnitude reduction in costs.

Andy Lambert:
Then when you couple that with commitments on scale, not only for your own manufacturing processes but for the entire supply base, they're equally willing to invest because they see the longevity and the returns that come from optimizing their own manufacturing processes. Even if we just take something like casting, then, how many molds are you putting in place? Are you doing single shot? Are you going to multishot? Again, you see this rapidly grow through the entire supply base and our own manufacturing processes in the ability to get costs down pretty significantly over the time.

Andy Lambert:
I really would urge everybody to not equally dismiss such a benefit of learning in a manufacturing environment with manufacturing principles and lean techniques. You're always looking for that waste in the process, and you learn day to day that that is significant. Once you have that culture that seeks to innovate on a daily basis, the key that I mentioned right at the start is you must have the ability to feed that imagination with the ability to quickly change and implement those changes.

Andy Lambert:
The rapid innovation capability I believe was one of the significant factors that helped SpaceX over the last nine years. Certainly we're going to do that, and leverage those capabilities inside Heliogen for our coming delivery.

Rob Wertheimer:
Thank you.

Caldwell Bailey:
At this time we have no further questions, so I would turn it back over to you, Bill, for closing comments.

Bill Gross:
Yes. Thank you very much for attending today. It's really great to meet all of you. We'd love to continue to grow this relationship. As you can tell, we're very passionate about

this opportunity. We're very excited to share this with you. We look forward to your questions. Your questions will make us a better and better company, so please stay in touch with us. Thank you again so much, Caldwell, for putting this on today. I look forward to continuing to update you.

Caldwell Bailey:
Thanks very much, everyone. That concludes our Heliogen analyst day. You may now disconnect.

Additional Information and Where to Find It

In connection with the proposed business combination, Athena Technology Acquisition Corp. ("Athena") has filed with the Securities and Exchange Commission ("SEC") a registration statement on Form S-4 containing a preliminary proxy statement and a preliminary prospectus, which has not yet become effective. After the registration statement is declared effective, Athena will mail a definitive proxy statement/prospectus relating to the proposed business combination to its stockholders. This communication does not contain all the information that should be considered concerning the proposed business combination and is not intended to form the basis of any investment decision or any other decision in respect of the business combination. Additional information about the proposed business combination and related transactions is described in Athena's combined proxy statement/prospectus relating to the proposed business combination and the businesses of Athena and Heliogen, Inc. ("Heliogen"), which Athena has filed with the SEC. The proposed business combination and related transactions will be submitted to stockholders of Athena for their consideration. Athena's stockholders and other interested persons are advised to read the preliminary proxy statement/prospectus and the amendments thereto and the definitive proxy statement/prospectus, when available, and other documents filed in connection with Athena's solicitation of proxies for its special meeting of stockholders to be held to approve, among other things, the proposed business combination and related transactions, because these materials will contain important information about Heliogen, Athena and the proposed business combination and related transactions. When available, the definitive proxy statement/prospectus and other relevant materials for the proposed business combination will be mailed to stockholders of Athena as of a record date to be established for voting on the proposed business combination and related transactions. Stockholders may also obtain a copy of the preliminary or definitive proxy statement/prospectus, once available, as well as other documents filed with the SEC by Athena, without charge, at the SEC's website located at www.sec.gov or by directing a request to Phyllis Newhouse, President and Chief Executive Officer, Athena Technology Acquisition Corp., 125 Townpark Drive, Suite 300, Kennesaw, GA 30144, or by telephone at (970) 924-0446.

Participants in the Solicitation

Athena, Heliogen and their respective directors and executive officers and other persons may be deemed to be participants in the solicitations of proxies from Athena's stockholders in respect of the proposed business combination and related transactions. Information regarding Athena's directors and executive officers is available in its Registration Statement on Form S-1 and the prospectus included therein filed with the SEC on March 3, 2021. Additional information regarding the participants in the proxy solicitation and a description of their direct and indirect interests is contained in the preliminary and, when available, will be contained in the definitive proxy statements/prospectus related to the proposed business combination and related transactions, and which can be obtained free of charge from the sources indicated above.

No Offer or Solicitation

This communication shall not constitute a solicitation of a proxy, consent or authorization with respect to any securities or in respect of the proposed transaction. This communication shall also not constitute an offer to sell or the solicitation of an offer to buy any securities, nor shall there be any sale of securities in any states or jurisdictions in which such offer, solicitation or sale would be unlawful prior to registration or qualification under the securities laws of any such jurisdiction.