Soluna Holdings, Inc.

Fireside Chat Highlights the Low Carbon Footprint of Its Datacenter and Growth Outlook in 2024

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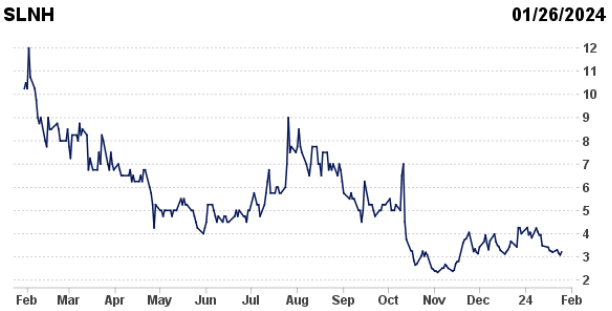
KEY POINTS

- **We recently hosted CEO John Belizaire for a fireside chat**, which included a discussion of the recent report from REsurety showing the lower carbon footprint of Soluna's flagship Project Dorothy, progress on Soluna's datacenters for AI, and the expected growth/potential catalysts in 2024. This report contains a transcript of the fireside chat from January 18, 2024, which can be accessed on demand.
- **Soluna's datacenters shown to have a significantly lower carbon footprint per the recent REsurety report.** The report concluded that Project Dorothy emits 18% less carbon emissions than a traditional datacenter located in the renewable-rich West Texas region and also up to 40% less carbon than its cryptocurrency mining peers around the country.
- **A validation of Soluna's model.** On the call, Belizaire explained how the REsurety report gives third-party data that proves the company's thesis that its unique modular data center design utilizing curtailed energy provides a better solution that yields significant carbon emission savings compared with other datacenters. Moreover, we see the low carbon attributes of Soluna's datacenters as making them a valuable solution to meet the rapidly growing power demand driven by the proliferation of AI.
- **2024 expected to be a year of growth.** Soluna is focused on growing its portfolio of existing projects through deploying Phase 2 of Project Dorothy, including the AI pilot, advancing the 166 MW Project Kati that was announced last summer, and further developing its robust project pipeline of more than 2,000 MW of projects. The company reached positive adjusted EBITDA in 3Q23, and we expect accelerating EBITDA growth in 2024 with a full quarter of Project Dorothy 1, contributions from more profitable contracts at Project Sophie and ancillary services revenue likely beginning in mid-2024.
- **Soluna helps solve the problem of power curtailment and in turn supports the growth of renewable energy.** Renewable power plants are increasingly needing to 'curtail' their power generation due to oversupply. By purchasing electricity that would have otherwise been unsold, Soluna helps improve project economics for renewable power and further its growth on the grid. Moreover, data centers can easily ramp down their power use to help balance the grid in times of extreme power demand.
- Please see our prior research on Soluna, which can be accessed here.

KEY STATISTICS

Ticker:Exchange	SLNH:NASDAQ
Current Price	$3.09
52-Week Range	$2.09-$12.50
Average Volume (30-Day)	198,841
Shares Outstanding (MM)	1.6
Market Cap ($MM)	$5.0
Fiscal Year-End	December

PRICE PERFORMANCE



ABOUT THE EXECUTIVE

John Belizaire
Chief Executive Officer

John Belizaire has served as a member of the Board and as Chief Executive Officer of Soluna Computing since October 2021 and was appointed CEO of Soluna Holdings in May of 2023. Prior to joining Soluna, Mr. Belizaire was the founder and CEO of FirstBest, a transformative insurance software company acquired by Guidewire Software, and Theory Center, an e-commerce software company acquired by BEA Systems. Before becoming an entrepreneur, he was the lead architect for Intel's Digital Enterprise Group. Mr. Belizaire has a B.S. in Computer Science and a Master of Engineering in Computer Science from Cornell University.

EXECUTIVE DISCUSSION

Graham Mattison: Welcome to Water Tower Research's fireside chat series. My name is Graham Mattison, one of the analysts here at Water Tower Research.

We're excited to have with us today John Belizaire of Soluna Holdings. I should mention that Soluna's safe harbor statements can be found on its website and in its public filings. As a reminder, this call and all of our research are available to all on our website.

John, great to have you back- earlier this month there was a report out showing your datacenters having lower carbon footprints Can you give us a quick summary of what that report said and some context as to why it's important for you?

John Belizaire: Happy to do so and thanks for having me back on these fireside chats. I always enjoy them. Yes, we did put out an update recently that included a really important announcement on the carbon footprint of our data centers. It focused on the Dorothy Project. Essentially, what we did is we hired REsurety, which is a software and solutions provider that is dedicated to accelerating the world's transition to zero-carbon futures. It analyzed Soluna's carbon footprint using the metric of something called local marginal emissions (LME), which is really a measure of the tons of carbon emissions displaced by one megawatt of clean energy.

By way of example, if you put one megawatt of demand on the grid at a specific location and that fires up one megawatt of a coal plant, then you've just added one megawatt or a certain footprint of carbon. It's very location-specific and point-in-time specific, which is important because when you're analyzing carbon emissions, you really want to take those factors into account and averages don't really tell you a lot.

We wanted to do this independent analysis because we feel it's important to validate what we've always believed about our facilities and that placing them with renewables consuming wasted energy would create a completely new standard for data centers. We're happy to announce that the independent analysis found that compared with our data center counterparts in ERCOT on the west territory of the state, Project Dorothy emits 18% less carbon annually. It should be noted that ERCOT West is a renewable heavy region and so it has a lower LME rate than ERCOT overall.

That's something we are consciously doing, putting our facilities where there's more green electrons, and more importantly, more wasted green electrons. By doing that and a number of other things that we do in our design, it allows us to be almost 20% less carbon intensive than other data centers.

Graham Mattison: Got it. There was also a figure in the report about a 40% lower carbon footprint. Can you explain the difference between the 40% and the 18%?

John Belizaire: Right. The first number, 18%, the sort of headline of the announcement, is the LME method. That's the method I just talked about. It measures our footprint at that location. Again, the report found that we emit 18% less carbon than traditional around-the-clock data centers located in West Texas.

Take a data center that might be running a Netflix stream or something like that, or other types of high-performance applications. If we did the same thing in our facility or if that data center was doing AI, if we did the same thing, we would emit 20% less carbon, give or take.

Now, the 40% is related to a study that came out sometime last year that was highly publicized by the New York Times. It was assisted by WattTime, which is a similar company to REsurety. We chose REsurety in our analysis because it has a way more advanced dataset, much higher granularity in terms of location. I think WattTime has probably seven or eight locations in terms of zones that you can be in. REsurety has thousands. It really has a more robust dataset.

What we did is we went back to that New York Times' WattTime and just for everybody's benefit, what the WattTime study said was that crypto data centers out there are actually not helping the environment. You're actually forcing more carbon to be emitted. Here's a stack ranking of all of the different data center counterparts.

What we did is we looked at that report and it found that an average, sort of an average megawatt in the sample set, induced emissions of 4,188 marginal carbon tons per year.

Take an average megawatt being produced by or consumed by these crypto places based on their location and whether the power was there, call it, 4,000 CO2 tons per year.

Now, what we did is, we took a similar methodology. We used the same methodology, but then we used our location in the analysis and re-ran the model. What we found was that due to Dorothy's location in that renewable-rich part of Texas and our ability, which is important to use the curtailed wind energy, induced an emissions level of 2,657 carbon tons per year. That's almost 40% less than our data center counterparts.

That's what that second number was meant to portray. Depending on how you look at the analysis comparing traditional data centers, compared with crypto using the WattTime analysis, we're significantly less. That is, in our view, a pivotal point for us because not only have we proven we can build these behind-the-meter models, develop partnerships with renewable energy power plant partners, execute and build the facilities and get them monetizing that energy, but we're actually doing something better for the environment, which has broad

implications. You asked me what's the significance of this. One, it proves the Soluna business model works. Two, it positions us well for AI. There's lots of talk about the growth of AI and what's going to be happening around that compute.

We believe that what we've done here with Dorothy on the crypto side is a great blueprint. It's a better mousetrap for the future of computing. Here's why. AI has three key challenges that no one's really talking about right now. We talk a lot about carbon emissions and the fact that crypto is bad for the environment and so forth, but we don't really talk a lot about traditional data centers out there and how much energy is consumed. We're now talking a lot more about data centers and compute because of the rise of AI.

Well, AI has three key challenges. One is that it's really hungry. If you look at the power density of AI compute compared with other high-performance compute that might be sitting inside of a traditional data center, its energy demand is exploding.

If you look at a typical rack, and I had to explain this to someone yesterday, if you walked into a data center, you look at a rack, you've got the raised floors and everything. That rack consumes somewhere about seven to eight kilowatts for that rack. Now, you've got a bunch of machines and CPUs running all sorts of software.

If you were to put AI in that same space, it would demand 10 times the amount of energy, somewhere around 50 watts to 60 kilowatts. Seven kilowatts to eight kilowatts versus 50 kilowatts. That's 10 times. If you look at that data center, all of a sudden, you need a lot more power, and you need a lot more space to crunch in that much energy demand.

Anecdotally, there's a view that AI will consume over the next decade more power than the entire global data center space alone.

There are some projections that I've heard sort of reaching 20 gigawatts to 30 gigawatts. If you're tracking with me so far, AI is hungry, right? Second, it's thirsty. Traditional data centers use a lot of water and water consumption to drive the heat rejection and cooling management. These chips get really hot, very similar to crypto.

Microsoft uses an equivalent estimate of about 2.8 million glasses of water to train ChatGPT. That's due to this concept, where heat exits the building, it goes into a cooling tower, and they use evaporation to cool that. There's water being pulled out of the ground and evaporating. That's a high carbon footprint, right? That's a high issue from a scope one and two perspective. Then the last thing is AI is dirty.

These facilities tend to be based in population centers. Most hyperscalers are in Virginia, Arizona, or these places, where you've got big access to bandwidth closer to the use of the compute. But if you look at data centers on a global basis and the US greenhouse gas emissions, 2% of the emissions are due to traditional data centers.

On a global basis, power consumption and greenhouse emissions are significant as it relates to data centers. More than half of that emission is coming from the US alone because we have half of the data center footprint on a global basis.

If you look at GPT, Gopher, BLOOM, OPT, they are consuming somewhere around 900 tons of carbon emissions. These are big numbers. What we're doing here can be applied to addressing these issues by building a new type of data center that's based completely in a completely different location that could create a more sustainable, scalable AI platform.

I know that's a long answer to your question, but we've been thinking about this a lot and we're pretty excited about this.

Graham Mattison: No, that was great. I think it was unfair that the New York Times painted everybody with the same brush because not all data centers are the same and the locations are different. I think it's intellectually dishonest to try and not look at them differently because it is different if you're in a high renewable place versus not. But I think it is great that you were able to show that difference in your report.

On that issue about the power demand from AI, that's a considerable issue that this country and the world's going to have to face because the power grid and the adequacy or reserve margins are getting tight. We've seen what's happened over the last few years at the peak heat levels and we are struggling to keep up. There's not enough power there and it is a problem that's going to have to be solved other than building large base load power plants.

John Belizaire: Exactly. That's right.

Graham Mattison: That solution will likely be a mix of things but demand response is probably one of the biggest things out there, which ties into how you set up your data centers.

John Belizaire: Exactly right. Most data centers, traditional data centers are around-the-clock facilities. They are not resources for the grid. We're using our sort of better mousetrap, if you will, which can achieve greater efficiency than our ERCOT counterparts because of our proprietary Maestro OS software. The fact that we can utilize the advanced aerodynamics and thermodynamics of our facilities to cool the facility without using water, that design enables the energy consumption by the facilities that almost entirely goes toward powering the computers and the operations.

More importantly, we can serve as a demand response solution for the grid. Imagine our entire facilities are full of AI compute, let's say. We're delivering massive compute capability to the marketplace as the demand rises. Our carbon footprint is significantly less than a traditional data center. Our flexibility powered by our proprietary technology then allows us to deliver a

resource to the grid that it can use in emergency situations, where it needs more power and it needs to be able to bring more of that green energy to the grid to power situations, whereas we've seen with sort of these cold snaps or the heat explosions in the summer.

When you put all of that together, we're creating a new type of data center that enables greater renewable energy integration, sustainable computing, and a utility scale demand response solution, which helps shape the future of the grid and the future of computing.

Graham Mattison: Yes, because ultimately, when you need more power, you either generate more megawatts, which can be a challenge these days, or you do 'nega-watts', take away load, which is demand response.

John Belizaire: Exactly.

Graham Mattison: Were you surprised by the results of the study?

John Belizaire: I think, as I was saying earlier, we've always felt at our core that what we were doing was the right approach. It just made intellectual industrial sense, industrial logic. When you look at the fact that there are massive amounts of green electrons being produced that aren't monetized, why can't that be a resource for computing and why wouldn't that produce a lower carbon footprint? The question was how you would be able to prove that and how would you analyze that? I think the report proved what we felt instinctively would be true. It highlights how the REsurety approach to doing LME with high granularity allows us to do the analysis in the best way.

What excites me is that now, we can point to this analysis and say, team, we're doing the right thing, investors we're doing the right thing and to the world, hey, look at this innovation, this could be a powerful tool for helping us with climate change.

It's very exciting. It was really energizing for the team. I would say that we're pretty jazzed about the opportunity ahead of us.

Graham Mattison: What's the feedback been like so far from project developers or other wind farm owners or even grid operators?

John Belizaire: Feedback has been great. We've had the power plant owner sort of give us a high-five. We've had some new investment partners that we have been in discussions with around Dorothy 2 and our AI initiatives who are very encouraged by the report. We recently discussed the results of the study with Rob Day, who is an Investor and Co-Founder of Spring Lane Capital.

As you all know, they're one of our major investors on the project level. We've got a podcast out on our clean integration series that I encourage everyone to go listen to. He does a great job of sharing his experience with this type of analysis. There's no perfect approach to doing this because all of this stuff is very new.

He was encouraged by the 18% level that we were able to produce. He said, I won't spoil the podcast for folks. But one thing he said, which really struck us, was imagine the entire data center industry was able to drop the carbon footprint by 18%. That would get us really close to our goals really fast. It put things in perspective and so far, the feedback has been very positive, and folks are very encouraged by what we're doing now.

Graham Mattison: I would encourage people to listen to the podcast. It's great. Also, you give a lot of detail in terms of how those measurements were done and the whole process of how you guys approached getting accurate and defendable metric. If you look at it from a corporation's or investing standpoint, we have moved past the point of just saying you have a low carbon aspirations, nowadays companies are under a lot more pressure to actually show results.

John Belizaire: That's right.

Graham Mattison: As we talked about before, one of the advantages for Soluna is that this actually helps the economics of the wind farm operator.

John Belizaire: Exactly.

Graham Mattison: That should put more renewables on the grid.

John Belizaire: That's a good point. The wind farm owners, as they look to partner with us, it's very helpful for them to know that, not only we're helping them economically, but they're adding an innovation that's also benefiting the grid and not creating harm to the grid or to the environment. I think that really drives more affinity toward our brand and will certainly help grow our pipeline over time.

Graham Mattison: John, we're coming up towards the end of our time. To wrap up with a final question, and it's also one that came in from the audience. As you sit here in mid-January, what should Soluna investors be looking for as we move into 2024 in terms of milestones?

John Belizaire: Well, Soluna is in a completely different place than we were last year. Last year was a bit of a crisis year for us. When I was ascending to the CEO seat, I probably was walking around with camouflage gear and body armor because I was definitely in wartime mode. Over the course of the last almost nine months or so, we've really been turning the ship. We went from 2Q, where our revenue and profit were changing as we were restructuring our business model, and then that has changed over the last several quarters, going in the right direction up in the right, if you will.

2024 is really a fresh start for us. We're focusing all of our energy on growth. We want to hit it out of the park on deploying Dorothy 2, including the Helix AI facility in Project Kati. By the way, we're moving to the proper pronunciation of Kati after Katalin Kariko, a Nobel Prize winner that we named the facility after.

Getting Kati through the planning process, so that facility, that project is shovel ready and ready to build. I sort of want to walk you through what's been happening across the facilities, right?

As for Project Sophie, we have completely restructured that project. It's all hosting contracts now and with this profit share component, it's become a very successful site for us. We've attracted some of the largest Bitcoin miners as partners in that facility.

Project Dorothy 2, the 50-megawatt facility that we're going to be focusing on launching this year, is very close to starting the construction bid process to get quotes. We can finalize the capex requirements for that. We've been working on procuring long lead items for that project.

The ERCOT model has been updated and Helix design is underway. Out CTO Dip and his team were actually visiting with one of the top data center design firms in the very cold part of Wisconsin these past couple weeks. They came back with some very exciting designs and approaches to that facility.

I'm really looking forward to that. At some point, when we're ready, we'll have to get Dip on the call. We've been sharing with folks the progress on Kati. All the studies have been completed and we've submitted those to ERCOT. It's really up to ERCOT to get back to us on clearings sort of those final sets.

We're hopeful that that'll be done by the end of this quarter. We're actually at the final stages of the definitive PPA agreements for that project as well. The only thing left is negotiating with the landowners and we plan to finish that at the end of this quarter too. It's just a lot underway and it's all about growth for 2024.

Graham Mattison: Certainly, a different place than you were a year ago. Congratulations.

John Belizaire: Absolutely, thank you.

Graham Mattison: Well, that wraps up our time, John. Thank you so much for joining us today and thank you everyone for participating in the podcast.

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With that, thanks very much, everyone.

John Belizaire: Thanks, Graham.

ABOUT THE ANALYST

Graham Mattison
Senior Research Analyst

Graham Mattison brings more than 20 years of experience in equity research, investor relations, and corporate operations, growth, and development. Graham was the Investor Relations Officer for two NASDAQ-listed companies where he led multiple equity raises as well as managed an activist investor campaign, M&A and corporate restructuring, and a NASDAQ delisting and relisting.

Previously, he was a Senior Equity Research Analyst, most recently at Lazard Capital Markets, covering the industrial and cleantech industries. He began his career in Southeast Asia as an Investment Analyst for Daiwa Securities. He was also co-founder of an online residential real estate start-up that developed a web-based auction platform.

Graham received his BA in East Asian Studies with minors in Economics and History from Hobart College and his MBA in Finance with honors from the Thunderbird International Business School at Arizona State University. He is an Investor Relations Charter (IRC) holder from the National Investor Relations Institute.

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