

# **Ballard Power Systems Inc. (BLDP) Q4 2023 Earnings Call Transcript**

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**Body**

Ballard Power Systems Inc. (BLDP)

Q4 2023 Earnings Conference Call

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Company Participants

Kate Charlton - IR

Randy MacEwen - CEO

Paul Dobson - CFO

Conference Call Participants

Rob Brown - Lake Street Capital Markets

Aaron MacNeil - TD Cowen

Sonia Jane - UPS

Dushyant Ailani - Jefferies

Jordan Levy - Truist Securities

Kashy Harrison - Piper Sandler

Vikram Bagri - Citi Capital

Brett Castelli - Morningstar

Presentation

Operator

Thank you for standing by. This is the conference operator. Welcome to the Ballard Power Systems' Fourth Quarter 2023 Results Conference Call. As a reminder, all participants are in listen-only mode and the conference is being recorded. [Operator Instructions]

I would now like to turn the conference over to Kate Charlton, Vice President, Investor Relations. Please go ahead.

Kate Charlton

Thank you, operator, and good morning. Welcome to Ballard's fourth quarter year and end 2023 financial and operating results conference call. With us on today's call are Randy MacEwen, Ballard's CEO; and Paul Dobson, Chief Financial Officer.

We will be making forward-looking statements that are based on management's current expectations, beliefs and assumptions concerning future events. Actual results could be materially different. Please refer to our most recent annual information form and other public filings for our complete disclaimer and related information.

I will now turn the call over to Randy.

Randy MacEwen

Thank you Kate and welcome everyone to today's conference call. Our Q4 and full year results demonstrated measured progress against the 2023 milestones we outlined for investors in our 2023 Capital Market's Day.

Let me share a few highlights from the year. We shipped 74 megawatts of product in 2023 including 540 fuel cell engines. We grew revenues on a year-over-year and quarter-over-quarter basis by 25% and 130% respectively. We made good progress on gross margins and cash burn which Paul will discuss.

We supported numerous customers in maturing their fuel cell platforms while also securing new customer platform wins across our verticals. We've increased our diversification across our business. We launched our next generation bipolar plate project to enable further cost reduction and production scaling.

We signed the UN Global Compact affirming our commitment to integrate universal sustained principles of environment, labor, human rights and anti-corruption in our business and we're now sourcing 100% of the hydrogen used at our Denmark facility from green sources.

We'll now zoom-in on our key market verticals for a brief update on each. Activity in our bus vertical indicates increasing acceptance of fuel cell buses for transit operators as a viable option to de-carbonize their fleets. Revenues from bus customers for the year were up almost 20% compared to the year 2022.

Even more encouraging, order backlog for bus customers is up 134% compared to the same period last year. Our growth in this market is highlighted by the success of our bus OEM customers including Solaris in Europe and New Flyer in North America.

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To illustrate just how far these customers have come in maturing their fuel cell platforms, I'll provide a brief overview of some of the evolution of these relationships. Solaris started its relationship with Ballard in 2013 when it ordered two fuel cell modules. For the next 10 years, Solaris ordered an aggregate of 213 modules or roughly 20 per year.

In 2023, Solaris ordered 365 modules from Ballard, more than three times the 98 modules it ordered in 2022. Solaris has developed a strong global position in the hydrogen fuel cell bus market and we believe Solaris is just getting started. For New Flyer from 2014 to 2022, New Flyer ordered a total of 103 engines from Ballard.

In 2023, New Flyer ordered 141 modules, surpassing the entire cumulative total of modules ordered prior to the year and also up more than four times the previous year's total. Similarly, we believe New Flyer is only beginning to scratch the surface of potential in the North American transit bus market. We continue to see growth in the deployment of fuel cell buses in our key regions.

According to our recent CALSTART survey on zero-emission buses, the number of hydrogen buses either ordered or deployed in the US increased 76% in 2023. Turning to the truck market, we continue to emphasize the need for patients in this market vertical while tier one OEMs develop truck platforms to bring to the market.

However, in the interim, we establish a new partnership with Ford Trucks for the European heavy duty truck platform along with another engine manufacturer in Europe. We believe these partnerships offer routes to scaled commercial volumes in this segment.

We have a double lane focus for the truck vertical. We'll continue to work towards establishing new relationships with truck OEMs and support them through the development phase of their fuel cell truck platforms and on to scale deployment. At the same time, we'll continue to be proactive in working with vehicle integrators and up-fitters and end-users to bring fuel cell truck platforms to the market in advance of the major OEMs.

Given an increasingly supportive national and state policy complex in the US for zero-emission trucks and fleets, we believe the US will be a key market for the adoption of hydrogen-powered fuel cell trucks. 2023 was an important year for our rail vertical. Revenues for the segment were up nearly four times from the prior year, and our order book is also up.

We're delighted to see growing market interest from our customers, CPKC, Siemens, and Stadler. We believe that interest from operators in using fuel cell engines to de-carbonize rail lines continues to grow, given the market requirements for high power and long distances and the avoided cost of catenary wire infrastructure.

We experienced significant growth in our marine vertical, with revenues in 2023, while still relatively modest, up roughly three times greater than the prior year. We're also pleased with the performance of Norled's MF Hydra Ferry, the world's first liquid hydrogen-fueled powered ferry, as it has now accumulated 4,000 hours of run time in real operation with excellent reliability.

Our order backlog for marine customers also experienced growth, has now doubled from the same period in 2022. The order backlog, combined with our purpose-built marine fuel cell engine that has two type approvals, positions us well to work with an increasing number of customers that want to de-carbonize their marine operations.

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In our stationary power market, we saw revenue grow by 15% in 2023. Revenue growth was driven by shipments to an increasing number of applications that use fuel cells for stationary power. For example, we saw megawatt-scale deliveries for customers using fuel cells to power data centers, EV charging stations, and even to support grid balancing in renewable power projects.

We've also seen the emergence of medium power applications, where fuel cells are deployed to power construction sites, TV and film production sites, EV charging, and smaller data centers as well. Our backlog from stationary power customers declined 36% year-over-year, reflecting the lumping nature of this business.

However, subsequent to the quarter, we received an order for 15 megawatts of fuel cell systems from a UK-based company that specializes in renewable off-grid power generation. We're particularly excited about this repeat customer, as 15 megawatts is more than triple the cumulative amount of fuel cells ordered by this customer previously. This demonstrates substantial momentum with this customer's platform and emerging opportunities for hydrogen fuel cells as a solution in the stationary power markets.

In 2023, we completed a successful demonstration of our fuel cell technology, where it provided back-up power for a data center over 48 hours with 99.999% uptime, in partnership with Caterpillar and Microsoft. This project provides substantial learnings that position us to capitalize on the growing power demand of data centers. The data center market offers considerable opportunities to deploy our products as backup power.

As of 2022, data centers consumed 84,000 gigawatt hours of power. To meet future power requirements of data centers, it's estimated that a further 70 gigawatts of renewable power capacity will be needed and added by 2027, and 21 gigawatts of fuel cell power will be needed over the same period.

In our emerging markets vertical, revenue declined 27% year-over-year, driven primarily by the conclusion of certain technology solutions programs and lower shipments to customers in the material handling and off-road segments. Our order book was also modestly lower at the end of the year compared to the prior year.

Similar to the truck market, the adoption of fuel cells in key heavy-duty markets like off-road vehicles and construction equipment is still in the early innings. In the near term, we'll continue supporting customers like First Mode as they plan deployments of their new gen solution to power ultra-class mining haul trucks with Ballard fuel cell engines at Anglo-American mining sites. We're also excited to see our customer-applied hydrogen deploy our fuel cell in a 30-ton excavator platform that will begin demonstrations in 2024.

Now, looking at our key geographic regions, European revenue grew close to 30% year-over-year and now account for more than 50% of our total order backlog. We continue to see important hydrogen policy developments in Europe. The EU has agreed on CO2 emission standards for heavy-duty vehicles that will require emissions to be reduced by 45% by 2030 for all vehicles above 7.5 tons and for city buses to be reduced by 45% by 2030.

The EU has also unveiled a target to reduce carbon emissions by 90% by 2040 as part of its Fit for 55 legislation, a target we expect will drive further interest in hydrogen fuel cells. Lastly, EU launched its first auction for hydrogen production subsidies valued EUR 800 million in the fall of 2023 and will launch an auction for further EUR 2.2 billion of support in spring 2024.

In North America, we see momentum for hydrogen and hydrogen fuel cells accelerating over the past year. Revenue from the region increased by more than 30% in 2023, while the order backlog for North American customers has more than doubled over the past year.

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For the US in particular, 2023 was a milestone year from a policy perspective, as seven hubs were awarded $7 billion to support the adoption of hydrogen across the value chain, while the IRS provided guidance for the 45B green hydrogen production tax credit. These policies, combined with electric grid limitations, will provide favorable tailwinds to our industry through 2032.

We're also encouraged by continued support at the state level, with California recently announcing close to $2 billion of funding that will be available to support the build-out of hydrogen refueling infrastructure, another key unlock for greater adoption of fuel cell vehicles.

We now turn to provide an update on China. And as a reminder, we have a joint venture with Weichai Power based in Weifang, Shandong province that addresses the bus, truck and forklift markets in China. The JV was established in 2018 as 51% owned by Weichai and 49% by Ballard.

Since that time, we built a new production facility in Weifang to manufacture bipolar plates, assemble stacks and manufacture fuel cell engines, all based on Ballard stack designs. Ballard supplies MEAs to the JV and the JV facility has approximately 225,000 square feet, including manufacturing lines for annual production capacity of 34,000 fuel cell stacks and 20,000 fuel cell engines, representing 2 gigawatts of fuel cells.

Over the past few years, the Weichai Ballard JV has developed a product suite of fuel cell engines for the China bus and truck market with nominal power ranges of 50 kilowatts, 80 kilowatts, 110 kilowatts, 160 kilowatts and 200 kilowatts. In terms of market adoption, we note that the hydrogen fuel cell industry struggled during the three years of various lockdowns during COVID-19 in 2020 through 2022 and with constrained local government funding coming out of COVID.

We're also seeing a very challenging macro-economic environment in China as well as continued challenges related to the hydrogen fuel cell electric vehicle policy landscape. Notwithstanding these challenges, the market made measured progress in 2023.

For full year '23, there were approximately 7,500 fuel cell electric vehicles sold in China, bringing total deployments to approximately 21,000 fuel cell electric vehicles, including approximately 7,300 fuel cell buses and 13,700 fuel cell trucks. Now, given that our Weichai Ballard joint venture doesn't have a strong exposure to five cluster regions under the National Fuel Cell Policy Program, our market share was adversely impacted in 2023.

Our Weichai Ballard JV sold approximately 200 modules in '23, primarily for the Shandong bus and truck market. Importantly, there's been continued investment in hydrogen refueling stations in China. At the end of 2023, 320 HRSs have been completed in China, which is almost 100 more than the end of 2022. There's also an additional 140 HRS currently under construction, which would bring the total HRSs to 460 in China. In Shandong province, there are 29 HRSs in operation, with another 9 under construction.

In a recent important policy development, which we believe is quite favourable to the Weichai Ballard joint venture, the Shandong government issued a new policy on February 29th that hydrogen fuel cell trucks will be exempted from paying highway tolls in Shandong for two years. This is expected to provide about a 20% TCO cost savings for truck operators, and should be an important catalyst for the adoption of fuel cell trucks in Shandong. The market is expecting other provinces to follow suit later in 2024. Our JV is still assessing this new policy.

Our JV is still assessing this new policy, including implications for 2024 and 2025. Based on current sales activities and this new policy, we're expecting growth in the fuel cell engine sales in 2024 at the Weichai Ballard JV. We're encouraged to see our business in China recover in 2023, as revenue grew by 30% year-over-year in-line with our key geographic markets.

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With that review of the verticals and the regions, we note that consolidated market activity rolled up to a record new order intake of $64.7 million in Q4. Let me repeat that. We achieved record new order intake of $64.7 million in Q4. Now when we look at our order backlog, it stood at $130.5 million at the end of the year, down 3.3% compared to the end of Q3.

There's some important context here. This new record order intake of $64.7 million in Q4 was more than offset by a reduction of $47.1 million, resulting from record engine shipments during the quarter, and the removal of $21.7 million from our order backlog of previously booked orders from a specific customer now experiencing financing and related program delays.

We believe this was a prudent approach at this time. We're working closely with this customer as they finalize their financing plans to enable a return of orders to the order book and a resumption of shipments in later 2024. Notably, we highlight that orders from power products represent more than 80% of the order backlog, while orders from customers in Europe and North America represent almost 80% of the order backlog.

With that, I'll turn it over to Paul to discuss our financials.

Paul Dobson

Thanks, Randy. In Q4, Ballard delivered $46.8 million in revenue, a record level of quarterly revenues for Ballard, and an increase of 132% compared to the same period in the previous year, driven by strong growth in the bus, rail, and marine verticals.

Ballard reported a gross margin of negative 22%, although this figure was negatively impacted by non-cash inventory provisions. Adjusting for this non-cash inventory charge underlying gross margins in Q4 were negative 1%, or very close to break even, driven by revenue scaling across fixed manufacturing costs and success with our product cost down initiatives. Our activity levels and product shipments in Q4 demonstrate our ability to successfully ramp and scale our production volumes, proving that we have the capabilities to meet growing customer demand.

For the full year of 2023, Ballard delivered revenues of $102.4 million, equating to a 25% annual growth. As we discussed at the Capital Markets Day earlier in the year, we projected margin improvement as revenue scaled and cost reduction initiatives were brought to fruition.

Reported gross margins of negative 21% were impacted by non-cash inventory charges, which when adjusted for, lead to a full year margin of negative 9%, compared to negative 10% in 2022, demonstrating progress in achieving gross margin break even as our revenue scales. We do not expect the same level of inventory adjustments to persist in 2024, given confidence in our ability to achieve our gross margin targets.

However, as revenues move up and down by quarter, gross margins will vary due to our fixed manufacturing costs. We reported total operating expenses of $149 million, including expenses for BMS, at the upper middle range of our guidance, and capital expenditures of $41.4 million at the bottom end of our guidance. Our total cash used in the business decreased by close to $48 million to approximately $163 million. We ended the year in a strong financial position with $751 million of cash.

Our financial results were materially impacted by a number of non-cash charges in the year. As noted previously, we recorded $12.6 million of non-cash charges in our cost of goods sold as a result of impairments to inventory of previous generations of products. Our net income was impacted by an equity investment impairment charge of $12.9 million, reflecting the compression of general market valuations for zero-emission vehicle manufacturers in our portfolio of long-term financial investments and intangible asset and goodwill impairments of $2.3 million and $24 million, respectively, as a result of our decision to wind up the Ballard Motive Solutions business.

Consistent with last year, we are now providing our guidance for total operating expense and capital expenditure in 2024. We anticipate total operating expense to be between $145 and $165 million, and for capital expenditures to be between $50 and $70 million. The increase in total operating expense guidance reflects inflationary increases and an acceleration of Ballard's efforts to develop a family of next generation products for small, medium, and large power requirements to streamline our product portfolio, thereby advancing product cost down initiatives and improving revenue scale benefits for our gross margins.

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The increase in capital expenditure guidance reflects a deferral of spending related to Ballard's next manufacturing facility from 2023 to 2024. Given the macroeconomic outlook and in the context of our 2024 annual operating plan, we continue to review our spend carefully to ensure we are appropriately investing in our growth strategy, while maintaining a strong balance sheet.

We expect that revenues in 2024 will be back-end weighted on a roughly 30-70 basis for H1 and H2, similar to 2023. We also expect that underlying gross margins will follow a similar path in 2024 as they did in 2023 as revenues scale through the year. We expect gross margins will break even or turn positive in Q4.

With that, I'll turn it over to Randy to wrap up the call before Q&A.

Randy MacEwen

Thanks, Paul. In the context of heightened geopolitical risks and continued de-globalization, we want to provide an update on our global manufacturing strategy, which we refer to as Local for Local. This is a plan to ensure we have the appropriate manufacturing footprint and assets in each of our three key markets, North America, Europe, and China, to support expected regional market demand growth through 2030.

In 2023, given an increasingly constructive hydrogen policy landscape and increased market activity in the U.S. and Europe, and given the continued hydrogen fuel cell policy uncertainties and market delays in China, as well as geopolitical risks, we decided to suspend our MEA localization plan in China while we completed a comparative analysis on manufacturing capacity expansion options and possible sequencing prioritization in the U.S. and or European markets.

We've concluded our comparative review and have prioritized the U.S. as the highest priority market for our next manufacturing facility. We have selected a site and are negotiating our land acquisition agreement. As an important part of this process, in 2023, we also submitted certain applications for government funding support in the U.S. when we expect to receive definitive feedback in the near-term.

Looking forward, we believe the transition of hydrogen policy announcements to implementation will provide mid-term momentum with availability of low-cost, low-carbon hydrogen, enabling accelerated adoption of fuel cells. In the context of an increasingly constructive policy environment, a growing sales pipeline and order book, along with our continued investment in product cost reduction and advanced manufacturing, we're well positioned for strong, long-term market share.

Finally, we expect 2024 will be marked by continued growth in our order backlog, major order announcements from customers in our bus and stationary power verticals, and the announcement of our next manufacturing facility, each of which will serve as important milestones on our journey to scaled adoption of hydrogen fuel cells.

Ballard is well positioned with a growing product order backlog, industry-leading fuel cell technology for our market applications, key customers and partnerships across our target markets, industry-leading deployment experience, and a strong balance sheet. We're confident we can deliver long-term shareholder value while making a meaningful impact by providing zero-emission fuel cell power for a sustainable planet.

With that, I'll turn the call back over to the operator for questions.

Question-and-Answer Session

Operator

Thank you. We will now begin the question-and-answer session. [Operator instructions] Our first question comes from Rob Brown of Lake Street Capital Markets. Please go ahead.

Rob Brown

Good morning. Just wanted to follow-up on the stationary market and some of the orders you've gotten there. I think pretty strong demand. Could you just give us some color on how the order activities looking in that market and maybe what's driving that bigger order in the UK?

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Randy MacEwen

Yes, Rob, I'd say a couple of things about the stationary power market. One is that we're still learning a lot about this market and particularly where the value proposition for fuel, PEM fuel cells particularly express themselves most strongly. And we're seeing that it's actually a diversity of different market applications of interest and this 150 megawatt order is a very good example. It's not specific to one market segment, but actually stationary power markets overall.

And I would say where you're seeing grid reliability issues or off-grid issues, certainly an area where PEM is in some cases primary, but in many cases as backup power is seeing interest. The market that I'm particularly interested in is the data center market. We all know about the growth occurring in the data center market.

Hyperscalers are looking at 10 times, 20 times type growth here in the next handful of years. And the number one barrier to adoption of new data centers is access to power. So there's a lot of work going on with the Hyperscalers looking at renewable energy PPAs at I would say record scale.

In addition to that, they're also looking at their stationary power requirements for backup. And we do see that zero-emission continues to be an important piece of the puzzle there as many of these Hyperscalers really do have very strong de-carbonization mandates. So that's a market that we're seeing a lot of interest and obviously made some work, some important progress last year with Caterpillar and Microsoft. That's a market we continue to learn on and I think will be one that will be providing updates as we go forward as well.

Operator

Our next question comes from Aaron MacNeil of TD Cowen. Please go ahead.

Aaron MacNeil

Morning all. Thanks for taking my questions. Randy, I can appreciate that this doesn't directly impact Ballard, but many saw the hourly matching requirement for green hydrogen production subsidies under the IRA as a potential negative for production levels in the U.S. I guess how did that impact your calculus and how do you ultimately get beyond that issue as you select the U.S. as the key market?

Randy MacEwen

Yes, so Aaron, thanks for the question. I do think that as you rewind the tape say six or nine months ago, there was a lot of optimism for the interpretation of the hydrogen PTC, which for clean hydrogen, the cleanest hydrogen is three dollars per kilogram. So we do have obviously some guidance issued in late December. There's a lot of work going on in the industry. Ballard is participating along with associations submitting responses. The three the three pillars as referred to that have been added, additionality, time matching as well as regionality all have some challenges associated with them.

In my opinion, if they're all accepted consistent with current guidance, we still have a very robust market for hydrogen, the access to low cost green hydrogen moving forward. My view is that some of them I think we'll see some difference in the final iterations. And I think the hourly matching one in my opinion is the most challenging of all of these. I think from a technical perspective, it's not viable to satisfy that one.

So that's what I expect that we'll see that pushed back. I think the concept of hourly will continue but the implementation time will likely be deferred. So whether that's 2028, 2030, 2032, not sure what the time frame will be but I do expect that one to be deferred.

Aaron MacNeil

Got it. And then maybe I'll just stick with this since we're already on the topic, but what's the sort of timeline for investment ramp up of the facility and you mentioned subsidies, so cost estimates both gross and net of those subsidies?

Randy MacEwen

Yes, we'll expect to be making announcement fairly imminently on kind of our US facility. We do see that there are opportunities to put some capital to work here and position us strongly in this market. So we will see in 2024 as part of the CAPEX that Paul already described in our guidance, we'll see contribution of that CAPEX coming from work for a new US facility. But I think you're going to have to wait a little bit, Aaron, fairly soon though.

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Operator

Our next question comes from Sonia Jane of UPS. Please go ahead.

Sonia Jane

Hi, you guys mentioned your Next Generation Bipolar Plate Project as part of a cost reduction program. How do you see future development with this opportunity and could you provide more color and cost reduction initiatives in 2024 and 2025?

Randy MacEwen

Yes, thanks for the question. And you'll recall during the Capital Markets Day last year, we announced this new Bipolar Plate Initiative. And previously we'd announced what we call our 3x3 stack cost reduction program to achieve a 70% cost reduction of our stacks, which, at last year we had achieved at least 55% of that and well on our way, in my opinion, to exceed the 70%, probably moving closer to 75%, by the end of this year.

Incremental, not included in that, incremental to that was this new Bipolar Plate Project. And, when you look at this project, it's really about looking at the five workstations we have in our process flow for plate production and introducing new equipment and production processes that will dramatically reduce the cost.

Part of that is effectively eliminating all labor. So this will be 100% fully automated as well as importantly, dramatically improving yields and reducing scrap rates and reducing tack time. So it's a very important initiative and we should see substantially complete that initiative by late this year with implications for a cost structure hitting in the 2025 time frame.

Operator

Our next question comes from Dushyant Ailiani of Jefferies. Please go ahead.

Dushyant Ailani

Hi, thank you for taking my questions. I think my first one is on just trying to understand, for 2024 growth within your sub-segments, where are you going to see the most? I think you talked about bus and stationary, but what about the others if you could kind of just break it down?

Randy MacEwen

Yes, thanks for the question. I think one of the things that we're really happy about is the diversification we're seeing across our revenue base from a vertical perspective, from a geographic market perspective, from a customer perspective. We're seeing that play out in our order book. We're seeing that play out in our sales pipeline. I do think in the very near term, the next few years, bus will continue to be the largest market.

We're seeing a lot of activity there in the European and North American bus market. Thousands of buses are currently being quoted in the marketplace. So I think there's a very significant transition there. I think one of the key drivers there, by the way, is really not just moving past the advantages, the operational advantages of range and refuel time, but also the challenges seen with scaling of recharging infrastructure.

And I think the ability to scale hydrogen refueling infrastructure showing significant CapEx advantages. So the bus market is clearly one we're going to see grow in the coming years. You did mention stationary. Stationary, rail and marine, I would highlight all very similar in that there are larger power requirements for these markets. And it means particularly in early stages of market adoption, you'll see lumpiness from quarter to quarter.

We've mentioned a few times that the rail market is surprised to the upside. We have I think some good news coming in the U.S. market for rail as well. But I would highlight that, of those markets, the one market that I think will continue to see some delays on is the truck market. But long-term, in my opinion, the truck market is very compelling, particularly in the U.S. commercial vehicle market where transportation is now displaced, electric power generation as the largest contributor to GHG emissions, and where Class 7 and Class 8 trucks disproportionately contribute almost half of GHG emissions and NOx emissions in the U.S. marketplace.

And when you look at the policies that are in place at the federal level, we just talked about, for example, the production tax credit for hydrogen. There's also some incentives in place for zero-emission battery electric and fuel cell electric trucks. And then you move to the state level, and particularly you've got the advanced clean trucks regulations in California, the advanced clean fleets. Those are, by the way, for regulating truck OEMs. You've got advanced clean fleets, which are regulating fleet operators.

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When you put all these together, I think from 2024 through 2035, there is a massive change coming in the U.S. market from diesel to zero-emission. And I think hydrogen fuel cells will play a very important role. And I just want to highlight again here, we're seeing that in the truck market, particularly heavier trucks, the barriers for recharging infrastructure and the capacity requirements for large fleets of large trucks and the implications and costs and availability of power as well as the lead times for feeder upgrades and substation upgrades ranging from anywhere from 12 to 48 months.

We see this as a very large market opportunity for hydrogen. So while we won't see, coming back to your question, near-term growth in the truck market, we're fairly bullish about the long-term growth market for trucks in our three key regions, but I'm just profiling there the US in particular.

Dushyant Ailani

Brilliant. Thank you so much for the detailed response. And my next question was just, I think you talked about some project delays from one of your customers. Are you hearing similar conversations from other customers or was this just a one-off thing? Could you give a little bit more details around that and where that kind of falls in within the segment?

Randy MacEwen

Yes, this is, I characterize very much as a one-off, many of the customers we have, we've got good visibility into their plans, good visibility into their balance sheet, etc. So this is a situation that is unfortunate, but we are working with that customer expecting to get back on track here in 2024.

Operator

Our next question comes from Jordan Levy of Truist Securities. Please go ahead.

Jordan Levy

Morning, all. Thanks for all the details. I just wanted to get a sense, I know that you said that kind of toward the end of the year, a similar trajectory on gross margins as you get toward the end of the year, kind of getting to that break even a positive gross margin. So I just wanted to get a sense, is sort of that 4Q level we saw of volumes or maybe slightly higher sort of the break-even level right now, adjusting for inventory impairments and that sort of thing? And should we expect that to continue kind of this year?

Paul Dobson

Yes, it's a Paul here, Jordan. Thanks for the question. Yes, I'd say that that sort of level of revenue and scaling possibly a little bit higher is indicative of where we think gross margin break-even is. You know what, we have to bear in mind though that our revenue has been shifting as well, more towards in favor of products. Product sales versus our technology solutions and product sales has a lower contribution margin. So that shift is going to have an impact as well.

But as we said in the comments, we don't expect the level of inventory provision that we took and I think we were being somewhat conservative in Q4 on our inventory provisions. We don't expect that same level to continue every year or every certainly at the end of year or fourth quarter. More historically, our inventory provisions have been in kind of a 6% range or six points of margin and we would see it sort of being in the 3% to 5% range going forward.

Just for inventory provisions subject to scaling of revenues. So we do expect with our 30%, 70% revenue split, that gross margins will go down again in Q1 and Q2 because of lower revenues and scaling effect but should be higher than H1 of 2023. Similarly, H2 in 2024 should be higher than 2023, adjusting for the inventory provision.

Operator

Our next question comes from Kashy Harrison of Piper Sandler. Please go ahead.

Kashy Harrison

Good morning, everybody, and thank you for taking my questions. So first one for me, Randy, in the closing section of your prepared remarks, you said that you expect the order book to grow in 2024 and that we should look out for some major announcements as well. And so I'm just wondering, is this 6060 million dollar order intake quarter, is that indicative of the new run rate moving forward? I'm just trying to get a sense of how you're thinking about your year-end '24 backlog under conservative assumptions.

Randy MacEwen

Yes, Kashy, what I'd say is that, when you look at our revenue, as Paul alluded to last year and this year, typically 70% weighted in the second half of the year and I think it was around 45% in Q4, we see a similar pattern on order intake as well, where order intake is typically weighted to the back part of the year. And there are a couple of reasons for that. But so I don't think you can expect to see a $60 million run rate, particularly early in the year.

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Kashy Harrison

Got it. Got it. But is there any way, can you give us maybe a conservative view on how much order growth we should be looking for in 2024?

Randy MacEwen

Yes, no, I think right now with where we are, it's probably not prudent for us to do that. We'll kind of report the quarter intake quarter to quarter and if we have good visibility on that later in the year, we can revisit that.

Kashy Harrison

Fair enough. And then my follow-up question, just a simple one. Is there a simple way to reconcile the year-end order book, whether it's the 12-month one or the total one to the next 12 months of revenues? Like do you have a simple rule of thumb for how we should be thinking about translating the order book into revenues? And that's it for me. Thank you.

Randy MacEwen

Yes, I think you could probably use 2023 as a bit of a guide, where in 2023 our order book was roughly 60-65% of the revenue that we actually recognized. So in other words, we had order book support coming into the year of in that 60-65% range for full year revenue.

Operator

Our next question comes from Vikram Bagri of Citi Capital. Please go ahead.

Vikram Bagri

Hi there. I was wondering if you could just share a bit more detail on the orders that you received in 4Q. Was there anything that kind of surprised to the upside there or maybe was even below what you could have expected? And then as you look out into the pipeline of orders, you had given some color on gross margin throughout the year, but just any color on kind of the margin profile of those potential orders that you see coming in would be helpful.

Randy MacEwen

Yes, I don't think there's anything that was surprising because, when we're working on sales opportunities, they typically don't come into the pipeline and get converted within a month. They're typically anywhere from 6 to 18 months of lead time and work with the customers. So and many of the customers, while we had some new customers, a lot of this is repeat business with customers that we have good customer intimacy and have visibility on where their plans are.

But I do think the stationary power market was probably the big surprise in terms of the aggregate order entry, not just in Q4, but obviously here in Q1 as well. If you went back a year or two, I probably wouldn't have been as bullish on the stationary power market showing that level of support. And by contrast, in fairness, I would say the truck market is probably where it's been slower than what I would have expected.

And then in terms of gross margins, when we look at pricing and look at our costs, I think Paul kind of profiled that we expect H1 2024 to be a modest improvement over H1 2023 and similar for the back half of 2024 compared to the back half of 2023 on an underlying basis.

Operator

Our next question comes from Brett Castelli of Morningstar. Please go ahead.

Brett Castelli

Hi, thank you. Just on the stationary market, I wanted to get your thoughts on what do you think is a realistic timeline for orders from data center customers specifically? Thank you.

Randy MacEwen

Yes, I think,mid-25 onward is probably a realistic time. I don't expect to have any material orders this year. What I will say is there are a number of very credible partners that have great visibility into the data center market that we're working with and exploring different business models, different value chain positioning as a way to look at long-term high value capture for this market. So there's a lot of work we'll be doing in 2024. It may not translate to orders, but it certainly will translate to positioning and then orders to follow in that 2025 time frame.

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Brett Castelli

Thanks, Randy and then on the ACT regulation in California, kind of a similar question. When do you think you start to see meaningful orders, maybe in the truck vertical, as a result of that regulation?

Randy MacEwen

Yes, so I mean just as a reminder for everyone, both the advanced clean truck and the advanced clean fleet regulations require a certain portion of vehicles to be zero-emission, not low emission. And this is a really important point, is that the policies are really focused on zero-emission in the U.S., not low emission. Starting to see, 2024 is the first year where a portion of trucks need to be zero-emission. This is very heavily weighted in terms of larger proportion in the lighter vehicles initially. And as you start moving out to 2025, '26, '27, '28, etc., the heavier vehicles start to see a larger penetration of new vehicles coming to the market that must be zero-emission.

So I think we're probably realistically two, three years away from seeing kind of beyond demonstrations and kind of larger scale deployments in the truck market. I think the really good news is that beyond California, there are now 13 additional states that have basically adopted and are adhering to California's rule on the commercial vehicle emissions. So this is very much, in my opinion, a U.S. story, not just a California story.

Operator

This concludes the question and answer session. I would like to turn the conference back over to Randy McEwen for any closing remarks.

Randy MacEwen

Yes, thank you all for joining us today. Paul, Kate, and I look forward to speaking with you next quarter. Thanks again.

Operator

This concludes today's conference call. You may disconnect your lines. Thank you for participating and have a pleasant day.

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