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CORPORATE PARTICIPANT
Parker Meeks – *Chief Executive Officer*

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Chris Pierce, Analyst, Needham & Company, LLC

Hey, good afternoon. Welcome to last session of day one of the in-person 26th Annual Needham Growth Conference. I'm Chris Pierce. I work in the Needham Research Department covering all things electrification, EV OEMs and EV charging. It's my pleasure to welcome Parker Meeks, CEO of Hyzon. Parker is going to do a brief introduction to the company. He's got a couple slides, he's going to show us, then we'll move into a fireside Q&A format. And anyone in the audience that has a question, just raise your hand and we'll be happy to work it in [indiscernible] (0:00:28)

Parker Meeks, Chief Executive Officer

Great. Thanks so much, Chris. Thanks for having me. We're excited to be here. So happy to spend a few minutes on Hyzon, set the baseline for who we are. And quite simply, at Hyzon, it starts and ends with the fuel cell technology. So, we have – we believe is the leading fuel cell technology in trucks today. 200 kW single stack fuel cell system is the largest single stack system that's in trucks on the road, commercially deployed. And we have a U.S. based manufacturing facility that's nearing start of production later this year.

Pairing that with an asset-light business model, which is doing third-party assembly for our trucks, right? So, we focus on the fuel cell technology. We develop the fuel cell trucks through the pro typing stage and as they get to production, a third-party assembler in the U.S., it's a company called Fontaine Modification, who does tens of thousands of trucks and trailers a year. They assemble the truck and scale it for us and we pay a very thin fee to them per a truck to assemble those trucks.

That combination, plus some design choices that we made in the truck itself, lead us to a very unique statement in our industry that we have a cash positive contribution margin truck that were delivered to large fleets last year, right? The gross margin cash contribution margin being positive already. Other competitors have said they need a 1,000-truck annual production level to have a breakeven truck, right? We are there from truck one.

We're very excited about having anchor customers in each of our three regions that we commercially deployed in last year. So, we commercially deployed 19 vehicles in the U.S., Europe and Australia by year-end 2023, meeting the high end of our guidance of 15 to 20 trucks and coach buses.

Our pipeline, we feel is quite strong. One of our key goals for 2024 is to continue to progress that pipeline, right? So, we completed over 10 large commercial trials in the U.S. alone last year. All those fleets are through their trial program, through months of work, and are in contract negotiations, right? So, it's about converting that pipeline.

And additionally, the subsidy environment that we're in, in the U.S. and Europe in particular is relatively strong, right? So, we can talk more about it later in the session. But there is a subsidy available today in California to do literally thousands of trucks. And we are excited to drive towards the programs with our fleets.

That's what we call the execution value of Hyzon, right? Putting our leading fuel cell technology into trucks, right? And we'll talk a little bit about what that looks like, assuming that we succeed. There's significant option value, upside value for the company beyond trucks, right? So that same fuel cell technology that's already in a 200 kW stage today, we are working early days on a 300 kW single stack fuel cell system, right? That's the foundation to put into things like locomotives, ground support vehicles for airports, stationary power, remote power, right?

These big TAM ecosystems, as the trucks are launched commercially, we have partners identified to go and to progress those solutions. Like, for instance, Schlumberger, the large oilfield services technology leader that we announced a joint development agreement with to do remote and stationary power.

So, a company that we think is set up with the right leading technology, focused on the right use case, with a cash positive truck today, scaling with customers that we're driving to convert more this year with one of the only and largest U.S. manufacturing plants once it comes online for fuel cells in the U.S., nearing its SOP in the second half of 2024. And one where we have, I think a strong option value for the future beyond trucks, which in of itself is a 200,000 truck a year market in the U.S., when you're talking about the Class 8 market.

And the final point is our leadership team, right? I've been CEO since August of 2022. We have completely turned over and strengthened our leadership team. The most recent example being our Chief Technology Officer that we've just brought on board, Dr. Christian Mohrdieck, who founded the Daimler fuel cell program and additionally was just the Chief Commercial Officer of cellcentric, the big Daimler, Volvo joint venture. That's sort of the core of thesis of Hyzon and I'll – there's been a brief amount of one more slide, then we get into the conversation.

This slide really summarizes how all that looks and feels specifically, intangibly, right? So, the 200-kW fuel cell system, that is our competitive edge. That is the value creation mechanism for the company. Having a single stack of 200 kW of power, single system to power a truck. Every other truck that you see on the road today, that that power level or higher that's coming to market uses two systems or two stacks, right? Our single system, 30% less weight, less volume, 25% less cost for us to manufacture, right?

And that provides a material advantage versus others who are having to use two systems and putting that truck into existing trucks, the three trucks you see are the three focus trucks that we deployed commercially to customers last year that we're now transitioning to the 200 kW, the conventional truck on the far left, the cab over truck for Europe and Australia for heavy haul, and the garbage truck.

And we should talk more about the garbage truck later because that truck has been deployed commercially in Australia now with a customer called Remondis, a very large European and Australian garbage truck operator. If you ask me, the race to decarbonize garbage trucks is over, right? Our refuse truck is performing flawlessly, full shifts, competing or outcompeting the combustion engine equivalent on work rate, where the best battery trucks go home at lunch, they're out of juice, and they have to charge all night for the next day's work, right?

And by the way, in Australia, that truck is operating at the same operating cost as the combustion engine equivalent without subsidy, which is a massive statement to make in a market where you have fuel, right? And the final piece at the bottom, we have – I actually joined the company as Chief Strategy Officer. My background before Hyzon actually is more infrastructure for oil and gas and chemicals and power transitioning to decarbonized fuels over time.

And I helped set up our relationships with some large names like TC Energy and Woodside, some global energy leaders, and some new great technology like Raven SR to provide hydrogen with our proprietary access to fuel at cost. So Raven, for instance, is bringing one of the first waste to hydrogen projects online here in the U.S. It's later to come online later this year or early 2025 in the Bay Area of California to bring zero carbon fuel to market from trash, which pairs very nicely with a fuel cell garbage truck returning to the same base.

So, it's a full ecosystem approach grounded in leading technology, again with platforms customers know and trust focused scaling with a strong pipeline that we're excited to bring forward.

Chris Pierce, Analyst, Needham & Company, LLC

Okay. Okay, great. As someone coming from an EV background and hearing about fleet electrification, can you kind of go a little deeper on why fuel cell might be a better answer in these larger vehicles?

Parker Meeks, Chief Executive Officer

Yeah. So, it's pretty simple, right? When you're talking about Class 8 heavy-duty freight, right? You're talking about 80,000 pound freight. Those trucks are – it's pretty low margin business, right? Generally speaking, those trucks need to carry as much weight as possible as far as possible and be up as long as possible. Not every use case, but a lot of that market, right? And battery trucks have challenges in all three of those things, right? So, weight, battery trucks typically are 46,000 pounds heavier than a fuel cell truck, right? That's revenue that truck can't carry.

Chris Pierce, Analyst, Needham & Company, LLC

And the weight specifically comes from the individual batteries…

Parker Meeks, Chief Executive Officer

The batteries themselves, right? So, they're very heavy, right? That can erode taking that 6,000 pounds of freight off the truck can take all the margin off that truck, right? The second is range, right? So early on, if you look at 2021, right, a lot of the subsidized trucks going to the market were battery trucks and that slowed way down, right? One example, one of the largest subsidy programs in the country is a California HVIP program administered by CARB, right? Those – today, there's $400 million available for heavy-duty truck decarbonization, right? This is a huge pool of money that is moving, but very slowly because very few people are buying battery trucks today.

When I joined Hyzon in 2021, those funding calls would open and be sold out in 20 minutes because battery trucks were flying, right? And what fleets are realizing is range. Range is a big issue. They headline 250 to 300 miles range, they're actually getting 180, right? So, range is a big issue where our fuel cell truck today goes 300 to 350 miles typically. And we have a liquid truck that we demonstrated up to 800-mile range.

Chris Pierce, Analyst, Needham & Company, LLC

Is that 250 actually real world 180, is that in California where there's warm weather too, or is that tested in like harsher environments?

Parker Meeks, Chief Executive Officer

In terms of the fuel cell, its…

Chris Pierce, Analyst, Needham & Company, LLC

Yeah, no, the range slippage, it's like…

Parker Meeks, Chief Executive Officer

Oh, the range, yeah, yeah. So, a lot of these weights are testing the technology in many different environments to see exactly that, right? So, I think we've had battery trucks tested in almost all 50 states. There's big testing going on up North as well in Canada. And when a fleet – when a large fleet, when 1,000 to 10,000 truck fleet is making a choice in technology, they're going to try everything.

When they're looking to optimize where in their fleet does this technology work? They're not just going to look at it in SoCal, right? So that's basically pointing them to say, look, while we're investing in California to start, because that's where the money is, we're going to put our energy and our resources against the technology that we think is going to actually scale, right?

So, the third piece actually is almost the most important in terms of the limiter for battery, which is charge time and infrastructure. So, when I – again, two years ago, people said hydrogen has an infrastructure disadvantage, right? Because there's no hydrogen fueling stations, we can just put chargers in, connect them to the grid, and away we go. And what they've realized is the transmission and distribution capacity in places like California, any large city can't handle very many 350 kW truck chargers, when you're trying to electrify a 400-truck fleet behind a single fence, right?

Try and put 10 to 20 megawatts of power behind a 60-year-old food and beverage warehouse's fence, and it's going to take you 5 to 10 years, right? So, lead times for chargers, infrastructure challenges actually are much more severe we've seen for battery electric, because the grid can't handle this concentration of power. And all this adds up to where all the fleets we're seeing. If you asked me two years ago, what percentage of the Class 8 market do I think in the U.S. goes fuel cell of all the trucks on the road, long range, short range, I probably would have said 60%. Today, I think the number is approaching 70%, 80% for some of these fleets because of what they're saying.

Chris Pierce, Analyst, Needham & Company, LLC

So, on the behind the fence charging, is it – can you kind of walk through the car has an onboard battery…

Parker Meeks, Chief Executive Officer

Yeah.

Chris Pierce, Analyst, Needham & Company, LLC

But the hydrogen, and I'm not going to say it right. So why don't you take a look?

Parker Meeks, Chief Executive Officer

Yeah. So, like quick one on one on how a fuel cell works and a fuel cell truck works. This diagram shows the basic layout of our fuel cell truck. It's the same class that you see. The yellow is the fuel cell. It goes where the engine goes that's actually unique to Hyzon. If you saw this, for most other competitors, they'd have one fuel cell there

and one somewhere else, because they need two, and it's hard to fit two where the engine goes. That's part of the benefit of our 200 kW single stack.

You do have batteries. Those blue boxes are batteries, right? They're much smaller. So, if a battery truck like the Tesla semi has 750 kW hours of battery capacity, ours has 110, right? You paired that with hydrogen fuel tanks behind the cab. So, 50 kg, think about that is 50 gallons of diesel, right?

Chris Pierce, Analyst, Needham & Company, LLC

Its green?

Parker Meeks, Chief Executive Officer

That's the gray. The green are radiators.

Chris Pierce, Analyst, Needham & Company, LLC

So, cool.

Parker Meeks, Chief Executive Officer

You got to cool those batteries.

Chris Pierce, Analyst, Needham & Company, LLC

Okay.

Parker Meeks, Chief Executive Officer

Cool that fuel cell, right? And then eventually, in the future, backed by the backlogs electric axles, right?

Chris Pierce, Analyst, Needham & Company, LLC

Okay.

Parker Meeks, Chief Executive Officer

So today we have a conventional axle that's part of our roadmap to improve the fuel efficiency along with some other component trees. So, the way that the fuel cell works, it's very simple. You have a single cell. That's a plastic membrane, basically a membrane electrode assembly. It's coated with a catalyst that's proprietary. Hyzon's unique IP goes all the way to the catalyst link, MEA and that single cell design, the bipolar plate that holds it together, that's unique to Hyzon.

One side's metallic, one side's graphite. Most use one or the other. We use both for purposeful reasons, to maximize the benefit, maximize the durability and the power density. You're stacking hundreds of those up into a single stack. That's a fuel cell stack, and it's surrounded by what's called a balance of plant. So that's compressors

and injectors and all the things it takes to actually inject hydrogen gas, inject in purified air, channel water out, which I'll talk about in a second, and then channel power out, right? So, you're putting in hydrogen, clean air, that is an electrochemical reaction across each one of those cells, you're generating electricity and water, and that's it, right?

So Hyzon's IP is throughout all the way down to the foundations of that fuel cell, where the power is generated. Others – other competitors buy their stack, buy their cells, right, or they might buy the entire system. You pair that fuel cell with batteries. Why do you do that? Why do you have batteries at all, right? When the truck – when you press the accelerator, the truck actually draws power from the battery first, right? So, its drives exactly the same as a battery truck, right, that same torque, that performance.

But the fuel cell is there to do two things. One is to recharge the battery as it draws down, right? So, you have an onboard charger, basically, and then to provide additional power to the truck when it needs it. So, think when you're driving on a flat road, pulling any amount of weight, but particularly 65,000 pounds, that battery is going to run. The fuel cell won't even be off, right? That battery drains down, fuel cell starts up, charges that battery backup, and draws hydrogen in from those tanks, right?

So, comparing that to a battery truck, right, you've got battery capacity on board. That's all you got, right? And to recharge that truck, you got to go sit somewhere and charge as fast as the charger can go. And again, like we spoke about before the challenge with charging is the speed of charging capacity and the capacity of the grid to handle it. With our truck, we refill those tanks typically in 15 to 20 minutes. So even though on the far right, you see the portfolio of truck options that we're developing over time to extend range.

So, the top right, that's our 100, 110-kilowatt truck that we delivered last year. That's the current generation of fuel cell. That truck gets between 300 and 350 mile range typically. Today, if you need to go 700 miles in a day, it's a 20 minutes fill. So, in the scheme of a 10-hour day, not a huge deal to a fleet, particularly those that are operating like most of our near-term fleets are in a back to base there.

Chris Pierce, Analyst, Needham & Company, LLC

And are you recharging the battery and refilling the hydrogen as well…

Parker Meeks, Chief Executive Officer

Just the hydrogen.

Chris Pierce, Analyst, Needham & Company, LLC

Just the hydrogen.

Parker Meeks, Chief Executive Officer

So, you pull up to a fueling dispenser, it looks and feels pretty similar to a diesel truck, right? There's a nozzle. You pull up, there's a nozzle. There are some safety procedures. You plug it in, you click it on, it fills up the tanks, and then you take it away.

Chris Pierce, Analyst, Needham & Company, LLC

So, the battery, in theory, never runs out because the hydrogen…

Parker Meeks, Chief Executive Officer

In theory, the battery never runs out, right, as long as you put fuel in, right? So that's – it's important to understand how that all works together, because you can optimize fuel efficiency on the fuel like we're just at the beginning of optimizing fuel efficiency for the fuel cell truck. We actually believe that. So, while today, we actually are at diesel parity from a total cost of ownership perspective with the subsidy available on the West Coast, right?

So, the California subsidies, once you take that off the cost of the truck with $6 a kilogram fuel, right, which we expect to have over the next two to three years, we're at TCO parity that's why fleets, they see that pathway and they're willing to buy. We expect by the time we get to 1,000 trucks of production capacity; the cost of truck comes down and the fuel efficiency goes up. If I go around the circle here, by putting the eAxle on the truck, which is coming, we expect in 2025.

By having the 200 kW fuel cell in the truck, we're already seeing 20% better fuel efficiency from the 200 kW fuel cell because of how that fuel cell operates now can optimize fuel efficiency. So, when you add these things up, we actually believe we're going to be at a place where fuel efficiency for fuel cell trucks is up to 20%, 25% better than diesel. That all drives us to where we believe we'll be at diesel parity from a TCO perspective without subsidy in as short as three to four years, a thousand trucks, basically, of capacity.

Chris Pierce, Analyst, Needham & Company, LLC

Did you have a question? You can tell.

Member of the Audience

No, I did not.

Chris Pierce, Analyst, Needham & Company, LLC

Sorry. I thought I saw you move your hand. My fault. So, we talked about behind the fence electrification.

Parker Meeks, Chief Executive Officer

Yeah.

Chris Pierce, Analyst, Needham & Company, LLC

How many megawatt chargers can you put in? How long does that take? What happens behind the fence with hydrogen charging?

Parker Meeks, Chief Executive Officer

Yeah. Yeah. So, look, it's nothing that there's not a challenge for infrastructure for fuel cell. There certainly is. We just think it's much less of a challenge, right? So, if you look at how fleets look to buy, let's start there, for a large fleet that may have 1,000 trucks, right, they may have a goal to scale up to buy 50 to 100 trucks a year as they decarbonize their fleet over time. That fleet is going to start with.

Chris Pierce, Analyst, Needham & Company, LLC

Can I just stop it? Those 50 to 100 trucks is anybody buying ICE trucks right now or what percentage of those trucks as they turn over their fleet is still ICE right now?

Parker Meeks, Chief Executive Officer

So, they will keep buying diesel trucks, right? It's all about how quickly do they want to have hydrogen trucks or battery trucks as a part of their decarbonization goal. So, one example, our anchor customer in the U.S. Performance Food Group, fifth largest private fleet in the country, 7,000 trucks, they have a stated goal to take 20% of the diesel out of their fleet by 2030, right? And we work closely with them. They are trying BEV trucks there for some time. They know fuel cell needs to be the majority of what they do.

So we announced the market that we have a 50 truck agreement with PFG over three tranches, a five once a kilowatt truck, binding agreement to start, those trucks we anticipated starting to deliver at the end of last year, 15 truck second tranche that confirms after a 200 kW trial and then a 30 truck option beyond that. So, it's going to be a scaled – scale up, but if they're going to achieve that, that, that 20%, that 1,500 truck goal by 2030, they're going to have to be buying hundreds of trucks by 2024 and…

Chris Pierce, Analyst, Needham & Company, LLC

So, you got annual kind of fleet maintenance as they kind of turn over their fleet. But as they turn over their fleet, a larger percentage of each year will be whether EV or hydrogen.

Parker Meeks, Chief Executive Officer

Exactly.

Chris Pierce, Analyst, Needham & Company, LLC

Yeah.

Parker Meeks, Chief Executive Officer

And that's where we're very focused on fleets that have that kind of a drive and goal. Back to base operations, refueling behind the fence, concentrated demand, easy to put in one refilling station behind their fence at the warehouse to fuel up anywhere from 50 to 400 trucks, depending on how large that warehouse is.

And that's how the fleets we're focused on. Look at it. They have – they might have 100 warehouses in their network. They're going to pick out and say, look, these 10 are going to go all fuel cell because they're longer range, they're heavier weight. And this is where fuel cell makes sense. These three might go battery because they're shorter range, lower weight, et cetera.

So, to your question, we have a phased approach to bring fuel to them, right? So today, it's mobile fuelers. So, think a tanker that you might see being pulled down the road full of gaseous fuel, right, that's parked on their location, that typical tanker can fuel anywhere from 20 to 40 trucks, right? So that's going to support them through the first two years of a phase up. While in parallel, they're permitting and building out the 30 to 100 truck initial station, right, behind their fence.

And that is the difference between fuel cell and battery. For a battery truck fleet transition, you may need four to six years permits to get substation build out to be able to add the chargers that you need. For fuel cell, really typically for hydrogen, it comes down to just the time to permit getting local authorities comfortable with it. But an 18-to-24-month time frame, they get a proper station installed well before then, you're working off mobile fuelers is what we're expecting.

Chris Pierce, Analyst, Needham & Company, LLC

And can you talk about hydrogen safety versus pumping through a megawatt of electricity?

Parker Meeks, Chief Executive Officer

Yeah, this is a huge deal for us, right. Well, hydrogen, they think of some of the movies you've seen of like the Hindenburg and things like that, right? But hydrogen actually, comparatively is very safe, understood and handled the right way. So, hydrogen is the lightest element on earth, right. If you puncture a hydrogen tank, that fuel, if there's no instantaneous spark, is going to evacuate and go straight up in the air. There's no pulling of vapors, right, versus gasoline or diesel. You have a puncture in a tank that fuel is going to leak out, it's going to pull vapors and create a big explosion risk.

Actually, there's been lots of videos out there, people taking a gun, shooting it out of hydrogen tank, creating a hole, that gas just hissing out, right? So, we do spend a lot of time on this with fire departments, with our customers, with maintenance crews, you do have to have safe practices, right? Hydrogen meters in your work shed, ventilation systems, et cetera. Different, but similar in many ways to CNG trucks, which have been around for a long, long time. So, this is all something that we have a very clear plan on. And the safety, the fact of safety show hydrogen actually is quite, quite safe.

Chris Pierce, Analyst, Needham & Company, LLC

And do you get a safety benefit from 100-kilowatt battery versus a 700-kilowatt battery as well.

Parker Meeks, Chief Executive Officer

We do believe less battery capacity means lower cost, means less scarcity materials and safety as well, right. Because we all seen the videos of battery fires and how long it takes to put out battery fires, how bad that can get. And the scarcity materials are also a big deal, right? That's part of the challenge we see in battery trucks. Lithium

and other materials in batteries are not getting easier to find. It's a huge part of the cost and the material structure for that. And hydrogen platinum is actually the most scarce material that's in the fuel cell. It's a very small quantity and we can recycle it at the end of life. So it's a much more attractive material profile for fuel cell trucks.

Chris Pierce, Analyst, Needham & Company, LLC

Can you touch on your competitors in this space? Are they legacy players trying to electrify and trying to take on hydrogen? And what's the go to market like? Are these vehicles bought through a distributor? And do you have to form distributor relationships, or do you have it direct to the consumer sales force?

Parker Meeks, Chief Executive Officer

Yeah. So, look, we do believe we have an early advantage that should persist for several years when you look at the fact base of who's actually deploying fuel cell trucks and when those should come to market. So, there's only two companies that announced they deployed vehicles commercially anyway in the U.S. this year. There's – of the larger OEMs, right, the majority of those companies have either not commented on commercial timing, or you look at the progress that they're making.

We expect a lot of those fuel cell trucks to come to market a few years down the road. Also, if you look at the trucks themselves, some of the trucks that are coming to market earlier are lower power, right? So, they're 160-kilowatt fuel cell power and they're going to struggle, we think, to do all the things that the fuel cell trucks need to do.

So we believe we have a multi-year advantage in time to secure customers, to start scaling, to put this technology out, to advance the technology, so that by the time others are bringing to market a 200 kilowatt plus fuel cell that has the advantages ours has today, we're two or three years into cost reduction, right, into proving durability, into scaling customers, right. So, if I've got several, a number of large fleets towards our 10-fleet 1,000 truck goal who are in their third-year scaling when others are just coming to market, we feel confident that we'll be an attractive partner for customers. And the other thing I'll say is, our goal actually is not to be in trucks for the long-term, right?

We're doing trucks today because we have to, because the OEMs, the traditional OEMs are going slowly. Our goal is – my goal is to hand a 1,000-truck business to an OEM, right? And the OEMs that we use their platforms are aware of what we're doing. We don't have any formal agreements in place today with them, but at some point, our goal is to be a leading fuel cell powertrain developer and partner with an OEM who's taking that higher working capital piece of the truck.

The sales process you asked about, and it is a two-tier sales process, right. So, we are direct to large fleet in setting up this commercial scaling pathway, because this is an executive level decision, right? These are boards driving these mandates. These are C level executives that are sponsoring these programs. That's why we're focused very specifically on the large fleets that have the mandates, right?

The trucks are actually sold in the U.S. through the existing dealer network, which is a benefit to us. We don't want to or need to put the capital in to develop a dealer network for service and maintenance, right? We work for the existing dealer network, existing service and maintenance network that these large fleets use today. We subcontract our techs into handle the fuel cell and high voltage bits to a start. We split the warranty with the OEM. If we touch it, we warranty it. If we don't touch it, then typically we don't. So, it's all built around an efficient

pathway to give customers the experience they're used to with the base truck that we're upfitting into, with the service network that they're using, and to set ourselves up to be a fuel cell provider and supplier in the future.

Chris Pierce, Analyst, Needham & Company, LLC

And can you talk about, you sort of touched on earlier, the upfitting or the – you're not making a chassis, you're just putting your technology inside an existing truck.

Parker Meeks, Chief Executive Officer

That's right. So, if you go back to some of the pictures, if you're driving around on the roads, you'll see a truck that looks – you'll see 40% of the market is that truck on the far left, right. So, the base vehicle that we use for the U.S. and Canadian truck is the largest market share truck in the U.S., and it's an almost every single fleet. So, the truck that we're using in Europe and Australia, the heavy haul truck in the middle is a very popular growing brand. It's a sub brand of one of the major OEMs, and that's a truck that, again, has an established service network.

It's got customer comfort and trust. The truck on the far right is a leading European garbage truck that's very, very well known. And that also helps us with working capital, right? So, for instance, when you look at the U.S. trucks, because of the dealer model, all these large fleets have trucks on order, right? So, whenever an order is placed, they go to their dealer and say, hey, take five of those diesel trucks that are coming off your line for this month, ship them to our third-party assembly partner, Fontaine, right?

Fontaine takes out the diesel, upfits our fuel cell, all the componentry, completes the truck, we validate it, ships to the customer. The cost stacks on the far right in that wheel, the portion of cost between the fuel cell, the thin fee we pay to assemble that truck, and the powertrain. You see the cabin chassis; the base truck is dotted. We don't carry that cost. A third of the working capital Hyzon never has to put up, right, because it sits on the dealer and the fleet's books. So, the whole model was built to have the right low-cost structure relatively speaking, to allow us to have a positive cash margin that you see on the left in the trucks that we're delivering today and to have a lower working capital.

Chris Pierce, Analyst, Needham & Company, LLC

So why wouldn't the truck OEM want to own this technology? You sort of hinted at maybe you will push it towards them as the market kind of develops. But I guess, why wouldn't you want to sell it to them too soon? Like, what's the right way to think about that? When you talked about the other TAMs, you kind of penetrate with this.

Parker Meeks, Chief Executive Officer

Yeah. When you look at the OEMs, they all have a statement about what they're doing in fuel cell, right? So, they're all trying something. They all talk about, most of them talk about fuel cell is going to be a part of the answer. In fact, one to point out, so Daimler, right, who owns Freightliner, they're doing a very similar strategy to us for the long-term on liquid hydrogen, right, for long haul, which we demonstrate a liquid hydrogen truck that went over 500 miles on a single fill, and we expect to go 800 plus miles once it's fully ready for market. OEMs need a certain volume of scale, right, for a platform to make sense to them.

So, we have active dialogue with several of the OEMs. They know what we're doing. We're all working for the same customers, right? So, you can imagine when one of their major fleet customers, a top 20 fleet in the U.S., orders our trucks and tells them, hey, you're shipping my trucks to those guys to put a fuel cell in it. There's a dialogue there, right? And it's basically all about us proving the backlog, right? Securing the customers, securing the backlog that are their largest customers anyway, to create competition to take on our platform.

Chris Pierce, Analyst, Needham & Company, LLC

And how do you – you had that slide where you talk about 19 trucks on the road right now. Is there a backlog conversation that you've been having with investors today or how do you kind of – do you build the spec or build the backlog? What's the right way to think about it?

Parker Meeks, Chief Executive Officer

Yeah. So, we haven't announced a truck level backlog since our restructuring, but we have talked about the fleet level pipeline, and that's what's on the bottom of this slide. So just to talk to it, we have 12 fleets under contract today of some kind. They're not all like PFG's 50 truck agreements. Some are smaller, some are about the same size. 19 globally are at that critical trial negotiation stage, right? And those are the fleets that we're driving to push from trial to contract and building towards our goal. But assuming we succeed, right, what this looks like in a few years is ten of the largest fleets in the country under contract, right, where they've got these 50 to 100 truck commercial agreements over multiple stages, where there's a clear path for us, assuming we deliver, right.

Assuming that we execute on these conditional agreements and we reach that third and fourth year of scaling that we're approaching, that there's a clear path to that 1,000 truck per year, capacity limit and truck backlog with, again, founded with some of the largest fleets in each region that have a real ESG ambition goal, right. And that, we think, is a compelling execution vision, that there's a lot of risk for us, obviously, in delivering against that. But we're confident, given the start that we have with our deliveries last year and the business model. And we think that that assuming that we deliver that can become a very compelling vision for OEMs to partner with us and to decide that they're ready, it's big enough for them to take over.

Chris Pierce, Analyst, Needham & Company, LLC

And on point number three there, the 1,000 trucks per year, is there a TAM or a number of industry trucks that turnover per year, like, what's the right way to think of that 1,000 as share? And then what's the right way to think of the capital light model? Like, how many trucks can you do on a yearly basis with this method that you have right now?

Parker Meeks, Chief Executive Officer

Yeah. So, on the market, U.S. market alone, 200,000 Class 8 trucks per year, roughly.

Chris Pierce, Analyst, Needham & Company, LLC

Okay.

Parker Meeks, Chief Executive Officer

Right. That's Class 8 trucks per year, roughly.

Chris Pierce, Analyst, Needham & Company, LLC

That are on the roads or that turnover.

Parker Meeks, Chief Executive Officer

That are sold every year.

Chris Pierce, Analyst, Needham & Company, LLC

Okay.

Parker Meeks, Chief Executive Officer

Right. You're talking in operation large fleet – largish fleet market, about 4 million trucks on the road, right. That's our sort of target market for that, right. And that 200,000 trucks per year, obviously 1,000 trucks per year is a tiny fraction, right. But that said, there are real goals to drive adoption. Take California, right. California's mandates that are starting to be implemented, there's a bit of a pause right now. Their goal by 2030, right, if they achieve that mandated goal of conversion of zero emission trucks, right. And if we're just 25% of the fuel cell trucks, which again, we're one of two that are deployed trucks today, we can drive the entire company to cash break even. Just selling trucks in California, meeting that portion of the mandate, right.

So, the market is not an issue. The ambition of the customer even is not an issue. You have plenty of large fleets that our trailing trucks are trying to figure this out. Subsidy, right? When you look at subsidy, subsidy also is not an issue from our view. U.S. has 400 million in California today, where it's only about a quarter million per truck. That gets us to TCO break even. You've got the zero-emission port equipment portion of $2.6 billion of the IRA, which is all ports across the country, $500 million per port available.

We've supported several of these grant applications that are going to be awarded December of 2024. Before you get to the $7 billion awarded to seven hydrogen hubs at the federal level, right? So, you've got customer demand, you've got a technology which we're showing is ready, you've got subsidy that's widely available. And if anything is increasing, particularly in the U.S. market. And the biggest focus for us right now is working with our partners on the fuel side to make sure that this fueling and dispensing solution can scale with it.

Chris Pierce, Analyst, Needham & Company, LLC

And are the hydrogen hubs on the map scaling right now or that planned in the future…

Parker Meeks, Chief Executive Officer

Yeah, so that currently they've awarded the seven hubs between $800 million or $1.2 billion per hub. We supported several of them directly. Those are in basically a project approval stage right now. So, the funding, we think, basically, think about it as California is today, that $400 million is available now. The IRA expect awards in

December 2024 to start flowing from 2025 on for those. And then the hub program, who knows exactly when. But assuming that it persists, I think about that as 2026.

Chris Pierce, Analyst, Needham & Company, LLC

And the hub program is for smaller fleets that wouldn't necessarily put in hydrogen fueling behind the fence or…

Parker Meeks, Chief Executive Officer

The hub program is – the way I think about that is that is creating, like, for instance, in Texas, the high velocity hub is the hub based in Houston, but looking to stimulate the entire Texas triangle of Houston, Dallas, Austin, San Antonio with refueling stations, with trucks, with other hydrogen production methods, with other industries like industrials to create an entire hydrogen ecosystem, but yes, to create the infrastructure so smaller fleets can also more easily access it.

So, think about it is, the California system allows both small and large fleets, but particularly large fleets, to get going with back to base type hubs where putting fuel in behind the fence and eventually public access. The port-based grants are to get this port ecosystem as an anchor point all on the coasts, and then even in the central hubs. And then the DoE hub program is really to fill in the gaps where it's going to be relatively straightforward and then connect longer haul.

Chris Pierce, Analyst, Needham & Company, LLC

And then just one more on the annual turnover. Are these grants pulling forward or increasing annual turnover or is that not the right way to think about it, where the fleets don't want to be spending too much or kind of – they want to go at their own pace. What's the right way to think about that?

Parker Meeks, Chief Executive Officer

Look, I mean, I think fleets want to see a value proposition that's economic, right? And fleets that have this many times board mandated ESG goal, they want to see economics where they can scale into something that's going to meet and beat TCO parity without subsidy, right. So, what these programs are about is giving us all the subsidy we need for only as long as we need it to make total cost of ownership parity with diesel happen sooner.

So, yes, pulling forward the investment in green equipment to allow companies like us to scale technology to be able to achieve the cost reductions and the efficiency gains we need so that we no longer need subsidy, which is why we think our plan that we're already seeing results from to drive the cost of the truck down, to drive the fuel efficiency up, to get off subsidy, we think at the truck level by 1,000 trucks of production. That's a compelling vision for us to only need these programs for three, four, five years, and then the fleets can participate in the market, hopefully with infrastructure established through these programs without needing subsidy.

Chris Pierce, Analyst, Needham & Company, LLC

So, we've talked a lot about kind of big picture stuff. What does 2024 look like? What are some headlines that investors should look for in 2024 to kind of let you know that the building blocks for 2026, 2027 are falling into place?

Parker Meeks, Chief Executive Officer

Yeah, I would say first, I talked on our last earnings call about this being an inflection point for us, right. So, completing our B sample stage for our development of the 200-kW fuel cell, progressing to a C sample stage, which basically you get to starting to use production tooling and preparing for sort of production commercialization second half of 2024. So, continue to progress on the fuel cell system in that C sample stage and being on track, and going from…

Chris Pierce, Analyst, Needham & Company, LLC

What does the C sample bring besides what's on the road right now, making trucks that are in demo?

Parker Meeks, Chief Executive Officer

So, in the fuel cell commercialization itself, it's basically a major step to pre-production effectively, right. So, it's taking our 200-kilowatt fuel cell system, our plant in the Chicago area, to a place where once we're through the C sample stage, we're basically on the cusp of production with a lock design, using production tooling.

Chris Pierce, Analyst, Needham & Company, LLC

Okay, so you're not at the 1,000-truck, like, you're not there yet. You wouldn't want to be there anyway, because you can't produce.

Parker Meeks, Chief Executive Officer

That's right. Yeah. We've said on our last call, at our SOP, second half of 2024, we expect to be at 700 fuel cell systems a year capacity, which carries us through year end of 2025 with a very, relatively low CapEx approach to debottleneck from there further. On the truck side, on the commercial side, it is all about converting pipeline, right? So, we delivered 19 trucks to customers globally last year.

Several anchor customers, performance, food grouping, one of them that we've either announced or were anticipating announcing that they were a part of that, potentially, it's about driving customers to their second order, right. Those that took, that took trucks last year and then securing that next set of large fleets, right, towards that 10 large fleet goal. And then finally, it's bringing some of these additional platforms to market, right. So, the garbage truck I spoke about, again, I think that refuse truck is going to be a really high potential truck for us. We deployed it first in Australia.

Again, it's performing very, very well. The first U.S. version has arrived here in the U.S. the base truck is powered. The back-end garbage compactor is going on now. So, it's about starting commercial trials with that truck and then securing orders on the garbage truck and showing the potential for that platform to scale. That along with continuing our sharp focus on the balance sheet and adding strategic capital through the process that we launched last year, we think puts us in a position, if we achieve those things to really drive this inflection point from 2023 through to starting scaling with a balance sheet that can support it.

Chris Pierce, Analyst, Needham & Company, LLC

Okay. Okay. We appreciate the time today. Thanks for going deeper on the story.

Parker Meeks, Chief Executive Officer

Thanks so much, Chris.

Chris Pierce, Analyst, Needham & Company, LLC

Yeah.