

## TRANSCRIPT

### TRATON GROUP Webcast 2024: Current developments in the battery electric commercial vehicle market

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#### Introduction

**Claudia Fuhrmann [00:00 – 01:42]** the transport industry is a major contributor to greenhouse gas emissions, reducing the carbon footprint of truck and bus fleets will also contribute to a cleaner future. And it also offers opportunities for fleet owners.

The first 10,000 electric haulage trucks alone could save up to 1 million tons of CO<sub>2</sub> annually.

On our agenda today:

- Unveiling the Value: Why electrifying fleets is more than just green.
- Navigating the customer journey: Defining a path to success.
- Empowering Operators: Training and service in the electric age.
- Collaboration for impact: The power of long-term partnerships

Joining us for our discussion today are panel speakers from the TRATON GROUP and our brands; Andreas Kammel, Vice President for alternative drivetrains at the TRATON GROUP; Stefan Sahlmann in the U.S. Vice President, EV Solutions and Activation at Navistar and previously Vice President, Head of MAN Transport Solutions at MAN Truck & Bus. And last but not least, Fredrik Allard, Senior Vice President, Head of E-Mobility at Scania Group. Welcome!

**Andreas Kammel [01:42 – 01:42]** Thank you.

**Fredrik Allard [01:42 – 01:42]** Thank you.

## 1. Unveiling the Value: Why electrifying fleets is more than just green.

**Claudia Fuhrmann [01:43 - 02:31]** *For you watching, following our panel discussion, we will have a Q&A session. So feel free to send in your questions via the chat function.*

*Now let's kick off our discussion. As I already mentioned, the transformation of transportation is not only a green endeavor. The shift to electric vehicles in the transport sector also promises a revolution in operational efficiency and is driving profitability for fleet owners. Electrifying vehicle fleet means changing the rules of the game, which is never easy. In this case, we have to overcome various challenges. One of them is the initial cost of transition. The cost of battery electric vehicles is often seen as a key barrier for a broader adoption.*

*Andreas, do fleet operators really face higher operational costs with the battery-electric trucks?*

**Andreas Kammel [02:32 - 03:26]** *I would argue, done right, it can be quite the opposite actually – especially in intensively used applications like long haulage. Of course, upfront cost is going to be higher. We see that on the screen as well. That's mostly due to the battery cost. But in haulage, total cost is dominated by energy cost, by driver cost, all these operational expenses that we accrue over time. So especially in an intensively used application, this is what dominates the cost picture.*

*And then, of course, importantly, electricity is cheaper than diesel. And that means that in the end, especially in those applications, we have a significant cost advantage by going electric. So basically, the idea is just to use the product intensively enough. And so we can only encourage all of our customers to just use it, to use it to its fullest. And of course, we are more than happy to offer our support there with our consulting services.*

**Claudia Fuhrmann [03:26 - 03:47]** *The transportation industry already operates on really thin margins. So higher purchasing costs add another financial burden for our customers. This also means that financing options are more important than ever to make the transition viable. Fredrik, what are Scania and the TRATON GROUP doing to support our customers there?*

**Fredrik Allard [03:47 - 06:19]** *Yes. To start with, I would say that with electrification, it's really important that we are offering total solutions to our customers. And the financing part of that is one integral part of a total solution. And we often talk about financing as the glue, putting all the other parts together. So, I mean you basically need an electric truck, you need an R&M contract, you need a superstructure, and you need, of course, with the electrification, a charging setup.*

And we are offering that. Scania has been offering financial services for more than 20 years. And we are the Scania Financial Services last year, stepping over and became TRATON Financial Services, giving the same services for all the brands. Basically, there are 2 ways of financing a truck, either you buy it cash or you rent it. The rental part has different names, but it basically comes down to that. And what is new is really that it is an integral part of the total solution. That it's not something on the side, that it really comes together with the other part of the solution.

Another partly new thing is the insecurity of the residual value. Of course, when financing something, you need to know what it is worth after a few years in operation. And here, it's us from the OEM that could support and give the real the best input in what is the value of a used electric truck. Because we are exploring the possibilities now how to use the battery after the life in the truck and make sure that the value of the battery is as high as possible also afterwards. So that is really the new thing. The total solution and the residual value, and we are supporting our customer in that. And I know that also Navistar has a long history of giving or offering financial services to your customers. Stefan, can you elaborate a little about that?

**Stefan Sahlmann - [06:20 - 07:59]** Yes. Thank you, Fredrik. Absolutely correct. Navistar Financial Services was relaunched in October last year under TRATON Financial Services. But as you already mentioned, the brand has a very strong background of acting in the market over 75 years. And if you can imagine how the transport industry has changed over this long period of time. And this was only possible with the flexibility, always offering the best customized financing solutions to our customers.

And as you already mentioned as well, now moving into this new era of BEV, the financing demand for the vehicles but also for charging infrastructure is even increasing and getting bigger. And therefore, our record of success gives us the confidence that we will be able to offer always the best tailored financing solutions to our customers. That they are able to bundle the vehicles, the related services and the charges in an optimal way to support their business and their sustainability goals.

And with the backing of TRATON, our customers can really have the faith that we have the financial strength to support them during this transition of fleet electrification. And this will give our customers security for a long-term relationship and the faith that we will be able to support them. And this will also help the loyalty that our customers will purchase further vehicles here in our brands.

**Claudia Fuhrmann [07:59 - 08:13]** *So getting the financing sorted is one of the important steps where we help our customers to get ahead of the game. Andreas, what other factors do they need to consider when they want to transition to BEV?*

**Andreas Kammel [08:13 - 10:21]** I would definitely say charging. Charging is going to be the main barrier, especially from a time perspective as well. Batteries in comparison can be amortized rather quickly. If you, again, the point from before, use those trucks intensively enough. But charging, of course, has to be there. And within the realm of charging, the big game changer is going to be MCS, megawatt charging, an upcoming standard that allows us to go for something like a 45-minute recharge just during the mandatory rest period. And that, of course, means that our batteries can be smaller, cheaper, more lightweight and with all kinds of advantages. It means we don't have the payload issues we might otherwise incur in long haulage.

It means we don't have the charging time losses. And of course, it means we get the full energy cost advantage that makes this business case so great with just half or a bit more than half the battery size. So it's almost like cheating. But of course, it takes time to get there. And of course, 2 conditions have to be met. First of all, the infrastructure has to be there. And secondly, the infrastructure has to be cheap enough. And this is where some preconceptions come in from time to time, where we see some players out there expect prices to be quite high, but they don't need to be. And there are a couple of reasons behind this.

The first reason is utilization is going to be much higher than it is, for example, for passenger cars. Many of those comparisons, what it should cost, they come from the passenger car side in the end. And the second is, of course, the costly part is the grid connection. If you have that, you can use that more intensively with trucks. And you can get to a point where you're looking at maybe adding overnight charging on top. So you've got the overnight charging and you've got that high intense usage with no like vacation periods to cater to. Basically, almost equal usage between Mondays and Saturdays.

And last but not least, when it comes to that public charging, you've got a lot of flexibility on top. Flexibility meaning you go with your charges where the grid is cheap, where the land is cheap. So all of this combined means prices are not quite as high as we would expect them to be, and that is crucial because then, of course, the trade-off is worth it to go for a smaller battery, but for more charging instead.

**Claudia Fuhrmann [10:21 - 10:36]** *So you already mentioned that the uptime is important, but the truck is always running and we have to utilize this. So different to a passenger car, you probably can't just go and stop somewhere and plug the charger and charge your vehicle. So I guess, a charging strategy is also really important.*

**Andreas Kammel [10:37 - 12:33]** Yes. And maybe there are different ways to separate this into different regimes or archetypes. One of them could be to maybe look at something like public versus private charging on 1 axis, think of it like this on route versus on-site and the other access then being more fast versus slow. And we start with maybe the fast and on route part of things. We see this on the screen as basically number 2 in here, that is based on MCS. That's exactly where we need those super high-power chargers for something on

the order of 1 megawatt and typically aimed at that midday rest period, those 45 minutes or less that they have to do every 4.5 hours our drivers anyway.

So that is the key enabler for long-distance applications. And it can also be something that can help if, for example, private depot build-out is not as fast as we would like to see it because those depots are where they are, sometimes it can be easier, sometimes it can be harder to build them out. But that would be, of course, the main archetype, the usual archetype, looking at those on-site depots, slow overnight charging typically on the order of it can differ quite a bit. But on the order of 100 kilowatts. And there, we are talking about basically the main archetype for almost every application out there.

And then if we talk about the other 2 sides of that 2x2 matrix, if you think about the 2 characteristics on site was on route and fast versus slow then we have on-site fast. That could be logistic hubs, that could be destination charging, for example, while loading, while unloading that can be a bit quicker than the overnight charging, but it will, in many cases, not be at around 1 megawatt, can be 1 or 2 hours, for example.

And then the last archetype, this comes handy when we already have the good connection for those fast chargers on route, we can add the slow charging, the overnight charging at rest base, of course, as well with the same grid connection behind it. So that's typically the same kind of charging power as you would get in a private depot overnight as well, just in a public space.

**Claudia Fuhrmann [12:34 - 12:45]** *So you have told us why intensively used applications are such a good business case for BEVs. But that's not the only reason why we at the TRATON GROUP focus on the strategy.*

**Andreas Kammel [12:45 - 14:41]** No, it's, of course, also because of the emissions. So, we do have sky high efficiency with battery-electric vehicles compared to basically every other application. Even if we just go for the electricity mix, we are talking about something on the order of 50% of reduction potential today, even including the amortization of the battery, the CO<sub>2</sub> footprint of the battery simply because the truck is being used intensively, that CO<sub>2</sub> footprint is not that immense in the end, relatively speaking. And of course, that's not the intent. We don't attempt to go for the mix. We go for green electricity. And with that, the effect is much more pronounced. Nothing comes even close. So as you mentioned, the first 10,000 trucks in heavy-duty, they can already save up to 1 million tons of CO<sub>2</sub> annually. But of course, ultimately, where we think the most of pressure comes into the market is simply by this being cheaper by this exerting margin pressure. It's not just down to TCO parity, it's when we are a couple of margins beyond TCO parity that we expect there to be the most of pressure in the market. Because at some point, it isn't going to be a choice anymore. So that means we don't see any true alternative to battery-electric vehicles, for example, there's always a lot of discussion on hydrogen or other alternatives out there, but that tends to be something that when energy

systems are being treated as they are – as coupled, we don't get to a point where we have cheap hydrogen and cost electricity, both move in the same direction.

And then, of course, there are different competitive use cases for hydrogen and some of them may have better business cases, like energy reconversion in a stationary setting, for example. So, we don't expect to see a lot of hydrogen in our business. So, we don't really have an option B, to be honest, but it also means our option A luckily is significantly cheaper and significantly better from a mission perspective. Which is, of course, coupled because efficiency goes into both equations. And so that's what we're aiming for. That's what, in our opinion, is going to be the mainstream going forward.

**Claudia Fuhrmann [14:42 - 14:58]** *But if BEVs are so crucial, we have the question how do we get to the point where we have actually a significant uptake. Stefan, from your experience, what is it that motivates customers to make the switch to an electric fleet?*

**Stefan Sahlmann [14:58 - 16:40]** Yes. In general, I see three main drivers for that. One thing are the sustainability goals. More and more companies are defining sustainability goals for their business. And by doing that, they are seeking for partners and suppliers whose products and services support this journey to decarbonize their business.

Second, I see the rapid advancement of the technology. Battery electric vehicle technology is getting better and better with every new generation of batteries. So, the range of the vehicles is increasing due to higher energy density of the batteries, and at the same time, our customers identify there is cost saving potential as Andreas already mentioned, with this new technology. For example, recently, a customer near National Tennessee told me that he is saving over 50% of the monthly energy cost just by operating now the new full electric IC school bus compared to the conventional school bus he operated before.

And finally, as a key driver, I see the guiding hand of the regulations here, especially in the North American market. So, the regulation from the governmental entities mandate not only the vehicle standard for us is OEM, but also they are defining the purchasing of our customers renewing their fleet. And I see bringing all these 3 factors together and working together, all stakeholders will make this success of the transformation of the transport segment.

**Claudia Fuhrmann [16:40 - 16:55]** *So, Stefan, one important factor you mentioned are the regulations. Fredrik, can you give us a status update on what's the status there in Europe?*

**Fredrik Allard [16:55 - 18:55]** Yes, absolutely because I really see that the European Union is taking a leadership in this question, and this is pushing the complete industry. And I think that is what we all need to have the common targets on where we are heading. So if

the proposed CO<sub>2</sub> targets will be approved as it seems, very much seems like they will be. It means that from 2019 the European Union then asks for a reduction of 45% in the CO<sub>2</sub> emissions from the vehicle of new sales at that year. And the same figure then for 2035 is minus 65%. And then by 2040, minus 90%. This goes very much hand-in-hand with our TRATON targets that we have set up with 50% of volume should be zero emission vehicles by 2030.

And it's then pushing the whole industry, because I mean, we need the economy of scale here as well because what will drive the cost down of the vehicle and the business of the charging is, of course, scaling this. So, it's very important. And to support this, with these clear targets, we see different member countries of the European Union supporting this and pushing their transport sector giving incentives like in Germany and Switzerland, for instance, on the road tolls. So having a big difference between if you drive a combustion engine truck or if you drive a zero-emission vehicle, so that will really help the business case in the early phase.

**Claudia Fuhrmann [18:56 - 19:17]** *So, we have all the same environmental challenges, but the regulations vary, depending on the area of the world. At the TRATON GROUP, we have four different brands operating in different markets and with differing customer demands. Andreas, how do we ensure that each brand can meet these individual demands of their region and their customers?*

**Andreas Kammel [19:17 - 20:13]** Our solution to that challenge is called the TRATON Modular System. The idea is to have basically globally standardized technologies that allow us to both leverage the synergies between our brands, but at the same time, also still retain their original regional identities and be able to be very customer specific in their requirements. It's not just about, of course, the brand. It's also about the customer. We famously don't sell trucks too many times over but are very much focused on what exactly the need for each customer is. And this will allow us to do so at a large scale across all our brands globally. At the same time, of course, this comes at a great moment in history, right? It comes right at the beginning of this disruption of electrification, basically making it into the mainstream in the market. And that means that we have a chance now to take the right decisions going forward to basically have this result in an industry shaping portfolio.

## 2. Navigating the customer journey: Defining a path to success

**Claudia Fuhrmann [20:14 - 20:43]** *Thank you, Andreas. I think now it's time to shift our focus to the heart of electrification, the customer journey. And we already spoke about the fact that fleet operators face a multitude of challenges and considerations when they enter into the electrification journey.*

*Stefan at Navistar, you are already working very closely with the customers. Can you tell us what the typical pain points and considerations for fleet operators are when they consider to transition?*

**Stefan Sahlmann [20:44 - 23:36]** Yes. I think the guiding question for most of our customers is how does the new technology impact my business model. And therefore, Navistar is guiding the customer exactly to all these questions. And we're just not selling vehicles rather when offering a comprehensive solution to them. And also from my experience back from MAN, it's quite similar to what we saw here at Navistar. Both brands had a lot of experience first in the bus business by electrifying, for example, the MAN city bus for the European market on electrifying the IC school bus at Navistar for the North American market and now transferring this knowledge also to the truck segment.

And the customer expects us to partner with them and to identify the best optimal tailored solution for their specific operations. That also includes to define the proper infrastructure and the charging concept considering their operational needs. And we really stay through the complete process with our customer from the very early consideration about switching to the new technology, the planning phase, the implementation and beyond.

Sitting down with the customer and understanding their concerns, but also the drivers, why they want to change to the new technology and understand the short-term and long-term goals is essential to define the best optimal solution for their fleet electrification. Therefore, our electrification concept we offer at Navistar to our customers is based on telematic data, the customer is sharing with us. And based on this data, we are able to analyze their routes and networks in detail and identify which rules can be electrified easily in the first step.

Also, we are defining the charging strategy, considering the availability of the truck and the buses in the depot and matching with the time slots of low energy prices to improve their energy cost situation as well.

Further, you have to consider different environmental influence factors like topography or climate condition that influence also the consumption of the energy and therefore, also define the charging concept. And working this out together with our customers showed us in the past that they are quite positive impressed by this and they continue working with us and purchasing new vehicle and this positive experience we had.



**Claudia Fuhrmann [23:36 - 23:43]** *But you also work closely with our customers to identify the right financial setup for them, right?*

**Stefan Sahlmann [23:44 - 25:11]** Yes, correct. So, in addition to the financial services, the Navistar Financial Services offering, when it comes to the investment in vehicles, services and chargers, we also support our customers to identify government grants. And for example, recently, we went through the third round of the EPA clean school bus program and now waiting for the heavy-duty clean and vehicle program to be announced, hopefully, by end of this month. And all these different programs, the criteria are changing all the time. And now therefore, it's quite complex for our customers to navigate through this landscape.

And this is exactly where our team is then coming in and by identifying the governmental grants that are available for our customers. And we do that not only on the governmental level, but also, we are identifying incentives based on, from the state level or from local authorities. And by exploring how these different programs can be stacked, we give the financial support to our customers that they make the switch to an EV viable. And this is another way how we support our customer by consulting them in the topic grand identification and application.

**Claudia Fuhrmann [25:11 – 25:25]** *Thank you, Stefan. Fredrik, at Scania, you already have customers who run BEVs on the long-haul segment. Are there any experiences that you have, or learnings in the day-to-day operations? How does it change for the fleet operators?*

**Fredrik Allard [25:25 - 27:08]** I mean the first experience and really fun part of this is that it works. Simply that the feedback from this operation is that you can really drive 350 kilometers in one go. And you can also use the already existing public charging stations that are available. And within, we talked about the mega charging standard that will be upcoming soon. But already with the 370 that we have possible right now when the infrastructure that is available, you can see that within 45 minutes, you can really top up the truck and continue for several hours again. So, it works. That's, I would say, is the main conclusion.

Then, of course, in the early phase, it is to adapt the routes and the planning and also to have a good charging strategy. And just as Stefan is into, we are providing that we are going into the partnership approach, the adviser approach and using vehicle data of their existing operations, using that to really make a clear plan. How can you change the vehicle? What kind of routes should you start with? What depot charging setup do you need? How much energy do you need on your depot and where could you charge on the public side. So that is the main, another main conclusion, to have a good strategy of how you do this transformation.

**Claudia Fuhrmann [27:08 - 27:16]** *Thank you. And Stefan, are there any lessons you have learned from rolling out BEV fleets?*

**Stefan Sahlmann [27:17 - 30:18]** Yes. One of the lessons learned I would like to share is that rolling out a better electric vehicle fleet is different from rolling out a combustion engine fleet, but it's not more difficult. But at the same time, our customers have to consider and be aware of that this process is time consuming. So, it's feasible to electrify our fleet, but it needs a proper planning. And therefore, I just can recommend to our customers that they reach out in a very early phase to their dealers and us as OEMs to talk about their plans and this can even be years before the plan, the start of the operation of electric trucks or buses. It takes time to get prepared for that.

And then there are new influence factors as well. This is another learning I would like to share. So depending on the usage of the truck, the consumption influenced by the environmental influence factors, the battery configuration and the charging concept, you have to consider this new charging time in your operational schedule. And therefore, also time is necessary to do this planning and before you start operating.

And then there's a completely new topic coming up. It's called interoperability. Interoperability means the communication between the vehicle and the charging infrastructure. And even there are standards in the industry defined for that and it's essential that the customer is ticking that box before he starts operation and makes a proper testing between his individual vehicle and the infrastructure he installed and decide to be assured that the recharging of the battery works well.

But at the same time, we have positive learnings from the market, from our customers, recently the VP from truck sales, Debbie Shust, shared with me, see that once the drivers get used to the new truck, they really start loving it. They say it's so much more quiet and there are less vibrations compared to vehicles with a combustion engine. So, this is really positive feedback and lessons learned from our customer side.

But as well, we as OEM, it is important to learn with every new deployment of trucks. Recently, we received feedback from our customer Penske, one of the world's largest fleet operators. And based on this feedback, we improved the coverage of the high voltage harnesses behind the battery to give even more protection to the vehicle and the user. Or, for example, we recently redesigned the charging plug of our vehicles to make it easier, accessible and construct it more robust. So far, lessons learned from the Navistar side, but from Scania, I'm pretty sure, Fredrik, you also have some lessons learned to share.

**Fredrik Allard [30:19 - 32:39]**

Yes. I would like to go into two examples where we really have worked with this approach, as you're talking about, Stefan, where we have had customers reaching out long before they planned to have their first but all their fleet electrified. One example is Jula Logistics, where we have set up BEV transport between where they collect the containers and to their

central warehouse. And this is an operation where it's pretty heavy. It's with two containers, dual 40-foot containers and the combination, the vehicle and trailer combination is 35.4 meters actually.

And it has been very successful. And one really fun part about this is that this was the first time that these long combinations were shown in Sweden. And today, partly due to this, this is a combination that has been approved for large parts of the road system in Sweden. So, it's good. But on top of that, both Jula Logistics and Scania have learned a lot during this period, and we have now a solid plan how to make the total transformation for Jula Logistics with the complete vehicle park.

Another example with another customer, in the completely other segment is ASCO, it's a wholesale grocery business in Norway. And they are driving out groceries in the complete country then, so very remote areas as well. And what we have seen there, by working close together, is that this operation starts from day one with the charging setup and with the public charging that they are using. And they have a very forward-leaning plan to electrify all their fleet already by 2026, and we have a solid plan to make that happen.

### 3. Empowering operators (Training & Service)

**Claudia Fuhrmann [32:39 - 33:12]** *I think it's becoming obvious that it's not just about acquiring a vehicle when it comes to BEVs, but it's more about embracing a holistic approach. So we have to consider a lot of things. I think another vital part is that we ensure that those who drive and service the vehicle, are well equipped. I know that our brands are aiming to be more than just suppliers. You want to be trusted partners and you already provide different training programs. I think, Stefan, maybe you can tell us a little bit about what Navistar is already doing in that field?*

**Stefan Sahlmann [33:12 - 36:01]** Yes. In the area of zero emissions transportation, we developed different programs, and most of them are aiming on the dealer network and our customers. For example, the Navistar EV onboarding program is a unique support level for our customers stepping to this area of e-mobility and starting the operation the first time with electric vehicles. The mission of the program is to make the customer comfortable with new technology and to prepare them to start operation efficiently, right from the beginning once they receive the electric vehicle.

We are training on the customer side, the drivers, the technicians and the first responders. And this is done by conducting charging sessions, showing them how it works with the charging, by having a vehicle walk around, asking all the questions around the vehicles, and by conducting an intensive test drives with a specific focus on regenerative braking. So there are no open questions once they receive the vehicle and they really can start operating right from the beginning.

But that's not everything we're offering. So roughly 45 days after handing over the vehicle, we conduct a follow-up session to assure that there are no open questions that came up during the first test of the vehicles, so we can solve also and answer these questions.

For example, when we deployed the first electric school bus in the state of Wisconsin, we've not just educated the driver and the staff of our customers, but we also educated the students riding with the bus. To feeling more comfortable, understanding the new technology, learning about regenerative braking, how important that is and also to train them what to do in the case of an accident. So, this is, from our perspective, important that everyone feels comfortable with this new technology.

Having a look on the dealership side, we implemented an authorization process for our dealers that they are prepared to give service and maintenance to the new electric vehicle, once the vehicles are first time sold in their reach, they are responsible for. And such programs also mean a lot of investment in the dealer facilities, not only for charging infrastructure, but also investing and training of their staff. So having all these programs in place is a commitment towards our customers and dealers that we support them along this journey.

#### 4. Collaboration for success (Partnerships)

**Claudia Fuhrmann [36:02 - 36:24]** *Okay. I think it's fair to say that collaboration is the cornerstone of our TRATON GROUP success story. And we are not only collaborating very closely between the brands, but we also partner with industry experts and are driving innovation through selected partnerships. Andreas, can you share some examples.*

**Andreas Kammel [36:24 - 37:57]** We've been talking so much today about the importance of charging, so I have to go with an example there. As mentioned before, intensive usage of our goods is supremely important. So, I'll pick Milence. Milence is our joint venture between us TRATON and Daimler Volvo, so together, like 70%, 80% of the European heavy-duty truck market to actually enable BEV in long-haulage battery-electric vehicles. And to quite some extent at around at least 1,700 charging stations until 2027. And those are not run-of-the-mill charging stations. Those charging pools are like most of them, at least megawatt charging. So really, the 45-minute mandatory rest period, this is what it's aiming at. And we're already seeing some success even today. The first stations have opened, and there are more and more following. The cadence is quite quick at this point.

At the same time, the price point of those stations has been significantly lower than many people had expected. On the passenger car side, you often see something like 70 or 80 cents, on that order. But that first station opened to 39 cents, even though it is in an arguably higher electricity cost country. So our expectation is this will continue. We are at a point where the charging cost will not be as absurdly high as it is commonly expected. We

are at a point where utilization in trucks is, as mentioned, much higher than it is on the passenger car side. So, Milence, in our opinion, will be one of the most important players to get this right. But arguably, Fredrik, they will probably not be the only ones, right?

**Fredrik Allard [37:57 - 39:41]** No. They will not be the only ones. There are several initiatives and good initiatives in this direction. And that is great, that is what we need. But what we also need is to make public charging hassle-free for our customers, or for the transport, for the fleet owners. That's why we have started TRATON Charging Solutions. So basically, building up the service of making public charging hassle free. So, if you have this service, you should be able to go to any charging stations and just plug in your truck and get charged. That is the idea. And you get one invoice for your complete fleet. So, this is a multi-brand service. So, it's not bound to Scania or MAN truck, you can use other brands as well.

But basically, today to start with, you have one card that you can pay all the charging stations with. Today, we have contracts with 23 of the charge point operators in 13 different countries and 60 charging stations for trucks. And on top of that, we have 5,000 charging station for pass cars that are partly available. So, we are evaluating which one is truck friendly, where you can charge also in the pass car station. This is a very important service as well in the charging area.

**Claudia Fuhrmann [39:41 - 40:00]** *Yes. Thank you. And I think across the Group, we already conducted millions of BEV kilometers. So, to sum up or to finish our discussion, I think it would be nice to have a look at some examples, Fredrik you already mentioned Jula Logistics? Do you have anything else to share for Scania.*

**Fredrik Allard [40:00 - 40:34]** Yes. Of course, we have different and many examples of where we have been successful. And I mentioned Jula and I mentioned ASCO Logistics. But for sure, we have, I would say, in the area of around 1,000 preorders for our customers right now and many deliveries that is waiting for the moment.

**Claudia Fuhrmann [40:35 - 40:42]** *Yes, Stefan. Can you give us some examples from Navistar or MAN as well.*

**Stefan Sahlmann [40:43 - 43:51]** Yes, certainly. As you mentioned, MAN is comparable to Navistar. Both brands gained a lot of experience in the bus business first and then switching this experience and knowledge over to the truck segment. Focusing on Navistar, for example, by February of this year, Navistar was the leading supplier of fully electric school buses here in the North American market. So, they became on the same leading position as they have been in the combustion engine for years now. But also on the International Truck segment, there's one example I would like to share with you. One of our customers, U.S. Air Conditioning, he plans to decarbonize their business by installing

solar panels and facilities near Los Angeles, but also by testing different alternative drivetrain technologies. And once our dealer, West Trucks, presented the new international EMV, the medium-duty full electric truck, he was so convinced about this concept and the product itself that he decided to buy two of these units and test them. And after the successful test of the two units, he decided to add another two units to his fleet and to even by doing that, decarbonize their business. By the way, also different brand programs could be successfully applied to support this purchase of these trucks. So this was a very positive success story from the truck side.

And we have numerous deployments on the school bus side. So, we recently deployed 42 fully electric school buses to operator near Los Angeles for more to come for this operator then there were 10 units supplied in Texas near Houston, and during EPA program round 1, and we were able to finance 19 school buses in Alabama. So here, these are just some examples of the different success stories we had here at Navistar.

And just focusing on MAN: MAN started the serial production of their full electric city bus MAN line City Electric by fall 2020. And barely three years later, end of 2023, they produced the 1,000 unit in their Polish plants Starachowice. And at the end of the same year, 2023, MAN became the leading suppliers of full electric city buses in the European market, leading the top markets like Germany, Sweden, Norway, Spain or Belgium. So, these are just some success stories from the brands Navistar and MAN, but not to forget about our Brazilian sister brand. Andreas, maybe you have something to share about them.

**Andreas Kammel [43:52 - 44:30]** Again, thank you. There's some good news coming out of Brazil. Our colleagues have started production on the e-bus, it's called E-Bus coming out this year. Then we are, of course, talking about the e-delivery or starting production this year, then we're, of course, talking about the e-delivery, the truck that they have been producing for 5 years now. It's a fully electric truck made in Brazil and for Brazilian requirements as well with ranges of up to 250 kilometers depending on which type you're looking at. And to be fair, it's the nascent market, the e-truck market in Brazil, but Volkswagen Truck & Bus with that has a market share of 90% in that market at this point. So yes.

**Claudia Fuhrmann [44:31 - 45:27]** *Thank you to all of you. And I think with these positive examples, we should close our discussion today. I think one of the key takeaways of our discussion is, that electrification not only offers environmental benefits, but also substantial economic advantages for fleet owners. Through partnerships, innovation and comprehensive support, we navigate the journey towards a greener future together with all our brands. Thank you, Andreas. Thank you, Fredrik. Thank you, Stefan. And a big thank you to everyone watching this discussion. And now let's open the floor for your questions. You can send them in via the chat function if you haven't done so already. And I will wait to hear from you.*

## Part 4 – Q&A Session

**Claudia Fuhrmann [45:27 - 45:43]** *And I can see, we already have some questions here. So, the first question would be directed to you, Stefan. The U.S. does not have a midday rest requirement. How do you accommodate range/charging for the U.S. market?*

**Stefan Sahlmann [45:43 - 46:34]** Also in the U.S., we have some regulation for our drivers and making their brakes. And we currently also find the best regulation and how we consider the charging brakes, fitting best to the driver brakes. They are different from the European and maybe not such strict and slightly different across different states and also countries here in the North American market, but they are similar regulations and also our drivers have to make some brakes during operating a truck.

**Claudia Fuhrmann [46:25 - 46:31]** *Thank you. And Andreas, I think the next question is in your direction. Where will all the energy come from to charge all the trucks at the highway at the same time?*

**Andreas Kammel [46:31 - 48:15]** That's an interesting question and an important one to be fair. We're talking about a total requirement of around extra maybe 10% or so super long-term, towards 2040, 2050 when we expect the fleet share to also be dominated by electric vehicles. But that's quite some time and there's a lot of build-out of renewables as well at the same point of time. Secondly, we are talking very much about those applications being on-highway, being out of cities in most cases. So, we are talking about a lot of the electricity being in transmission lines or at the higher end of the distribution line system.

So, they're not as congested as some of the last-mile delivery lines would, for example, be in comparison. And lastly, and maybe something that is commonly very much underestimated most of these midday rest periods. They happen between like 9 a.m. and 3 p.m. during the midday parts of the day. This is also when in basically most all European countries by now, there's more and more solar energy coming in.

And during those hours of the day, you actually have a hard time getting rid of all of that solar electricity. You have to transport it over long distances, for example, or just turn off their solar plants. And having an equally distributed set of things for that electricity, trucks charging at different locations at around that time actually can help reduce pressure on the grid. That doesn't always happen that would be too nice to be true, but it still means on average, the grid impact is maybe three to five times lower than you would commonly think it would be with that. And that means the build-out is quite moderate, what you need. And of course, last point, you tend to go for those locations where it's actually easy to get it right, where you think you have lower cost hurdles from a land from a grid etc. perspective and less lead time.

**Claudia Fuhrmann [48:16 - 48:29]** *There is an addition to this question: What role do you see in immersive cooling regarding megawatt charging? And are there any issues with the charging cable getting hot regarding the charging time of 45 minutes?*

**Andreas Kammel [48:29 - 48:59]** To be fair, such a cable has to be cooled, liquid cooled typically. So that has some requirements on the charging cables at those speeds, not the MCS standard per se, but if you go to a megawatt or more, you will have to have that cooling and you will also need to have a certain maximum length to limit losses in that cable. So typically, you see something like a 4-meter or so cable. One of the reasons why we have a standardized location on the truck on the left-hand side for recharging. So, the stations are optimized for this, of course.

**Claudia Fuhrmann [49:00 - 49:19]** *Okay, thank you. And then we have another question. I think that's one for you, Frederic. When will the battery trucks become more affordable for transport operators? And in addition, how does charging time influence the TCO when operators cannot use the vehicle the whole day. Maybe it's also one for you (Andreas). Who wants to take it?*

**Fredrik Allard [49:20 - 50:34]** No, but the first question, when will it be affordable? I mean we are really aiming, that's what I was talking about with the clear targets of volume. I mean we need to get up we need to come up in volume, and by that, we will get the economy of scale on the track as such. So basically, I mean, we are aiming to come down to probably two times the price of a diesel truck in a few years, but we are really dependent also then on the development of the battery, of course. But we see a good development of that as well. And I think that the TCO parity with a truck that is more or less twice as expensive as a diesel truck, and then with the electricity price that is 10% to 20% of the cost of diesel, we will have a good TCO parity. When will it happen? Yes, it depends on the combination of the two. But I would say that within 3-4 years, we will have a good reduction of the price of the truck.

**Andreas Kammel [50:35 - 50:55]** And maybe to as a good lead into the second part of that, if we had that mega charging infrastructure at the price of those stations is already today, it would be much easier to be a TCO than it is for some of the less intensively used applications. So again, TCO is effectively going to be easier in long haulage, but of course, the infrastructure is the bigger hurdle there. You've been mentioning a second part of that question?

**Claudia Fuhrmann [50:55 - 51:03]** *Yes. The second part was, how does charging time influence the TCO?*



**Andreas Kammel [51:04 - 51:51]** It does, to quite a large extent at the point where we are right now. So, bringing it down to those 45 minutes is instrumental because in many cases, this means our customers can use their mandatory spirit, sometimes they can't, and then it's still an added amount of time spent, and then it makes sense to go even further below. For example, if you have slip seat driving, meaning two drivers, operating almost nonstop, and then you want to go for higher charging speeds.

And we're typically not there at this point, but those are also only like 5% or 10% of the market. Over time, we will get there though. For the current part of the market that we're focusing on, it's actually about the optimum. You would want to go for 4.5 hours, 45 minutes of charging, 4.5 hours of driving, etc, and ideally do this like 24/7. And then you get to the most intensive usage out of your product.

**Claudia Fuhrmann [51:51 - 52:07]** *If you have any further questions, you can still type them in, and I'll have a look if we have any more. We have one, which is more in regard to battery techniques. How have battery costs evolved over the past 12 months?*

**Andreas Kammel [52:08 - 53:07]** I can get this started. Battery, there are two sides to this. There has been one curve that has basically been unbroken now for decades, where battery cost every year has been coming down and quite a lot per year. And that is mostly due to scale effects due to this becoming more and more of mainstream technology across different utilization factors, not just trucks. At the same time, there is now an ever-growing factor of that cost is the cost for lithium, for cobalt, for manganese depending on your chemistry, all the raw materials in there. So more and more of what we are seeing lately has been basically that part of the material cost coming on top. And for example, 2022 was a spike in lithium and cobalt prices. That also means since then, prices have come down quite quickly, but basically only reverting to the back baseline behind this. So, we expect that on a long-term average, we will just see that scale effect, those learnings coming in, but we will see some bumps in that right depending on raw material prices coming on top.

**Claudia Fuhrmann [53:08 - 53:25]** *And the next question: How will you enable megawatt charging on the vehicle battery side when the vehicle battery also should be downsized to save costs? For example, coping with high C-rates, heat generated and impact on the battery lifetime.*

**Andreas Kammel [53:27 - 54:11]** Maybe one way to answer this is we are talking about C-rates that aren't that high. I mean we are still talking even a downsized battery in haulage still like 600-kilowatt hours or so. And we are talking, if you're talking about around 1 megawatt and 45 minutes is still something 1 point something Cs. We're not talking about three Cs, four Cs, what you typically see with passenger cars. So compared to a Porsche, for example, we're actually charging at rather slow speeds. There is still a bit of an impact on the battery. It's not negligible, but it's far less pronounced than it would be on a

passenger car battery. So, we're not yet talking about really a problematic way. This could be true if we go to the full extent of MCS, which at this point, there is no need for.

**Claudia Fuhrmann [54:12 - 54:23]** *And then one in direction of the fuel cells, does TRATON envision going hybrid or fuel cell, especially for long-haul application in the near or long-term future?*

**Fredrik Allard [54:24 - 54:31]** Yes. I mean we are, if you took hybrids and fuel cell, was that the questions or hybrid...

**Claudia Fuhrmann [54:32 - 54:33]** *Hybrid or fuel cells.*

**Fredrik Allard [54:33 - 55:04]** Yes. I mean, we are right now in the pilot phase, you can say. So we are doing a small series of fuel cells. So, we are basically testing this and following the development. And we believe that if we continue to see that it will stand for some 10% to 20% by 2029, 2030, we will have a product as well by then.

**Claudia Fuhrmann [55:05 - 55:22]** *Thank you. And Stefan, one question for you. What are the regional dynamics indicating, which region is poised to emerge as the primary global hub for battery-electric trucks and which region might experience delays in the short run?*

**Stefan Sahlmann [55:24 - 56:19]** Regions in the North American market. Certainly, they are different. Every state also have independent from the governmental regulation. They are also state regulations. So, there are some states like the state of California, who is pushing the electrification of the complete transport sector forward faster than others, but it's difficult to say if there are regions who were maybe lacking in this aspect because more and more regions and states here in the U.S. are also adapting, for example, regulations from states like California. So, we assume that there will be a governmental regulations that will give the guidance for a complete country. And therefore, we will have a go to a more equal situation over the complete market.

**Andreas Kammel [56:21 - 56:57]** Point to this in the U.S., in the U.S. blue states, the Democratic states, they tend to be stronger on the regulation side and forcing this into the market to some extent, especially the so-called COP states, but most red states think of places like Texas or Nebraska, Oklahoma, they tend to have low-cost electricity and often by half an order of magnitude lower than, for example, California. So, Texas is \$0.08, California is \$0.28 for commercial rates. That means many of those states that don't push it quite as hard from a regulation perspective, still have a great business case. This is why we

expect there not to be too many differences between different applications and different states.

**Claudia Fuhrmann [56:58 - 57:21]** *Okay. Thank you. And then we have, so yes, we have only 2 minutes left. That's the one thing I need to tell you, but we also have some questions left. So next one focuses on charging. When do you expect megawatt charging to be developed in sufficient quantity to allow viable long-distance heavy-duty transport, who wants to take this? Fredrik?*

**Fredrik Allard [57:24 - 58:05]** Yes. I mean, it will be available already from next year as a standard on the vehicle. And then how much of the public charging will be built out with megawatt charging and as Andreas was into before, I think we have one example with Milence that from their 1,700 charge point ordered by 2027, the majority will be megawatt charging standard. So I think, if I should put the year 2027 then would be a year where you will have enough of the public charging with megawatt charging standard.

**Claudia Fuhrmann [58:05 - 58:30]** *Okay. Well, thank you to all of you. And I think we have to finish up at this point in time because time is over. If anyone has a very urgent questions still left which we haven't answered, please feel free to reach out to us at TRATON. You can find our contact details on our website. And thank you everyone, for joining, and I wish you a good rest of the day.*

**Andreas Kammel [58:30-58:32]** Thank you.

**Stefan Sahlmann [58:30-58:32]** Thank you.

**Fredrik Allard [58:30-58:32]** Thank you.