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Mid-America Trucking Show 2008

The Certainty of SCR

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My topic today is SCR - Selective Catalytic Reduction – our chosen technology path for 2010. Given the recent flurry of press on the subject, the timing seems right for us to expand a little on our position, and to carefully explain why we have such confidence in this technology.

This talk is titled “the certainty of SCR”, because SCR is not some hypothetical, future technology, as some would have you believe. It is a technology that has been thoroughly tested and proven in real world applications. Daimler alone already has over 100,000 trucks in operation using SCR today, and it has proven itself to be sound and effective. Most importantly, it delivers exactly what it is supposed to: Cleaner emissions, improved economics, and reliable performance in the harshest environments, hot or cold.

We’re here to dispel the SCR misinformation being tossed out, and to talk about what we know works, and is in fact working today, in trucks worldwide. And since SCR utilizes DEF - diesel exhaust fluid - which is simply automotive grade urea – or what’s known as AdBlue in Europe, we’ll talk about the advances being made in distribution, too. Because ample distribution of DEF will also be a certainty in North America.

However, before we get into all that, maybe the first thing we need to do is remind ourselves about why we are doing all this in the first place. And the answer to that is that we are doing it because it flat out needs to be done.

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Why We Are Doing This…

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The Certainty of SCR

- **Cleaner Emissions**
- **Improved Economics**
- **Reliable Performance**

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Emissions, Health and our Promise

We hear a lot about how emissions negatively impact the ozone and contribute to global warming.

But the direct health impacts of diesel are also a concern. NOx contributes to smog, and smog contributes to more than 400,000 hospital visits every year for conditions related to asthma, respiratory and heart disease – all of which have been linked to Diesel exhaust. According to the Clean Air Task Force, more than ¾ of all Americans live near concentrated sources of Diesel exhaust.

So we're not really here today to debate technologies. We're here to say we are committed to reducing total emissions from our engines to the lowest possible levels - because that's our responsibility as executives, as parents … as people.

But we also have a goal to provide truckers sound business solutions as well as to produce the most fuel efficient trucks on the road - because that too is our responsibility. It is also our stated corporate strategy, and promise to our customers. And more than anything else, it is the simultaneous pursuit of both of these strategic objectives that underscores the logic, and certainty, of SCR.

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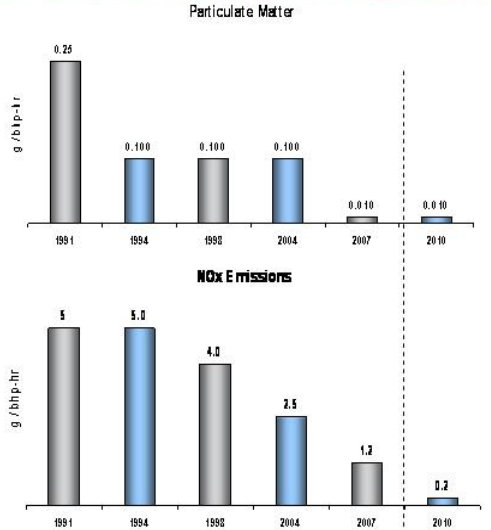
Driving NOx and Particulates To Near Zero



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SCR works for OEMs

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DETROIT DIESEL

VOLVO

Cummins

Mack

PACCAR

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The Technology Challenge

Development for EPA 2010 is upon us, and with it comes the most stringent requirements for near-zero levels of NOx to date.
Given the pace of regulatory and technical change, it makes sense that many are confused by current and future standards, and how they will impact what we produce. Let's take a moment to recap what is going on relative to emissions goals.

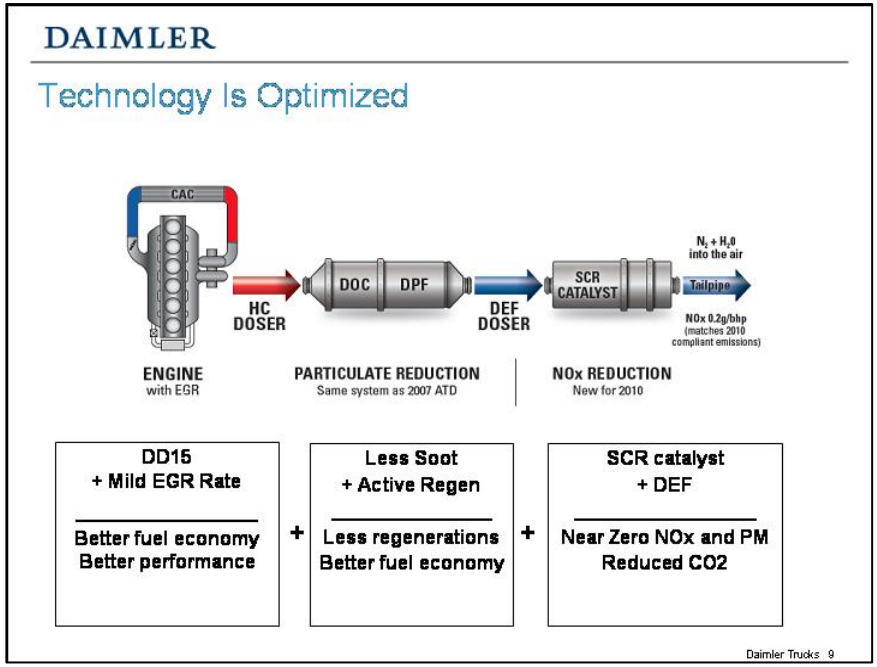
The top chart shows the decline in particulate matter. This problem, with EPA 07, is essentially solved.
The bottom chart shows NOX reductions – the primary concern going into 2010.

Do you do it with a new, enhanced EGR solution - a more intense, advanced version of what exists today – or with the addition of SCR technology? What's the difference, and what are the implications of each? The truth is there are perceived pros & cons either way.

Daimler's Perspective

It's no secret that Daimler trucks, a company with extensive expertise in the development of virtually all of the various truck engine technologies worldwide, has clearly chosen SCR. Why did we make this choice?

Quite simply, it's because SCR works for everyone. It works for OEM's, it works for truck customers, and it works for the EPA.



Why most OEM's like it

We and most other truck OEMs like it a lot because it brings value to our customers without trade-offs. We can hit the most stringent emissions targets and hit our reduced fuel consumption targets at the same time. This happens because every component in the system is allowed to be optimized in doing what it does best.

To better understand the importance of this, lets take a moment to look at exactly how SCR and non-SCR engines work:

To be fair, EGR – exhaust gas recirculation – can reduce Nitrogen Oxide out of the tailpipe. Also, please note that we will continue to have a moderate level of EGR on our own engines going forward. But without SCR, the significant reductions in NOx required for the next EPA round will attempt to push engine technology further than it's ever been pushed before. Increases in exhaust recirculation, heat rejection and altered combustion processes demand trade-offs we're not willing to make. I'm not saying it can't be done, but we know that basic physics will create some challenges relative to heat rejection, particulate build up and fuel consumption that must be overcome somehow. Without aftertreatment in the exhaust stream, whatever NOx comes out of the engine is by definition what comes out of the tailpipe.

This means the engine itself must do all of the work of NOx reduction, whatever the performance impacts may be.

In the case of SCR, the engine is focused on only one thing: optimal performance for pulling freight. There is no other objective. Optimizing engine performance, however, favors the production of higher levels of nitrogen oxides. Enter the Selective Catalytic Reduction system. SCR allows the engine to be configured to relatively high nitrogen oxide raw exhaust emissions, which are then effectively eliminated by injecting DEF into the exhaust stream. The result?

The engine stays focused on producing efficient power and torque over a long life, without also having to reduce emissions. This enhances fuel efficiency. Engine optimization reduces particulate output and, as a result, the particulate filter needs less regeneration, further enhancing fuel efficiency. Then, the SCR catalyst focuses upon reducing NOx in the exhaust stream. That's all it does, and it easily hits even the lowest emission requirements.

Each technology component is optimized by focusing on what it does best. Particulate and NOx are efficiently handled, without stressing the engine itself. That means the engine runs better, stays cooler, and lasts longer. And, perhaps most important at this stage, we already know from experience that the technology is extremely reliable. That's why from the perspective of most of the worlds OEM's today, it's ideal.

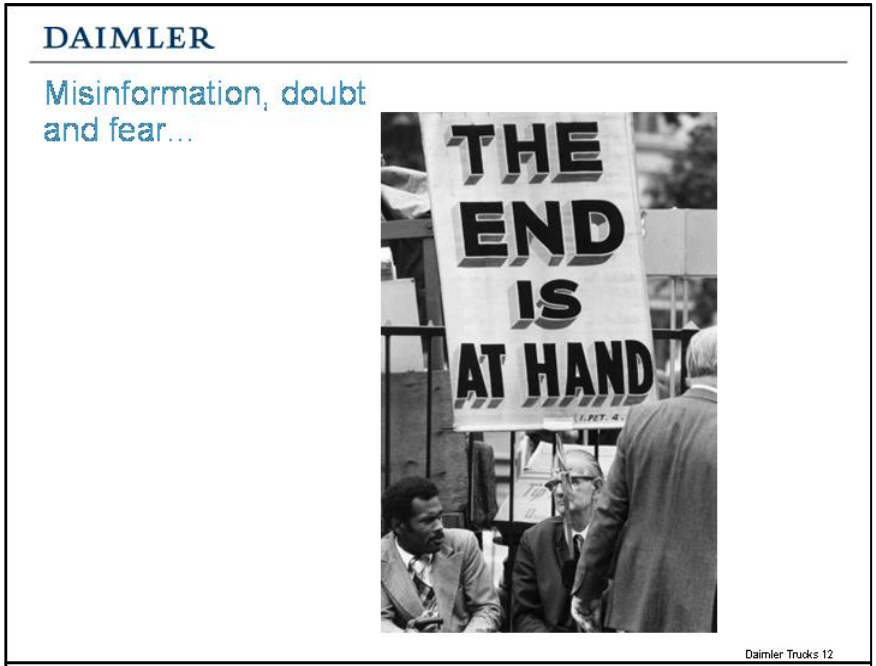
SCR works for customers

But how about from our customers standpoint? In an environment where fuel economy is increasingly critical, it is the ultimate solution. Both testing and real world operations in Europe are showing 3% – 5% improvement in fuel economy. Some customers are reporting more. There is no reason we can't expect similar results here. Considering how hard we work for each and every percentage, and what it's worth given today's fuel prices, we know that's significant to our customers.

SCR works for the EPA

The EPA loves SCR because we can hit the specific, near-zero emissions targets at the tailpipe without degrading fuel economy. Perhaps recent comments about SCR from one of the EPA's leading experts sums it up best when he said:

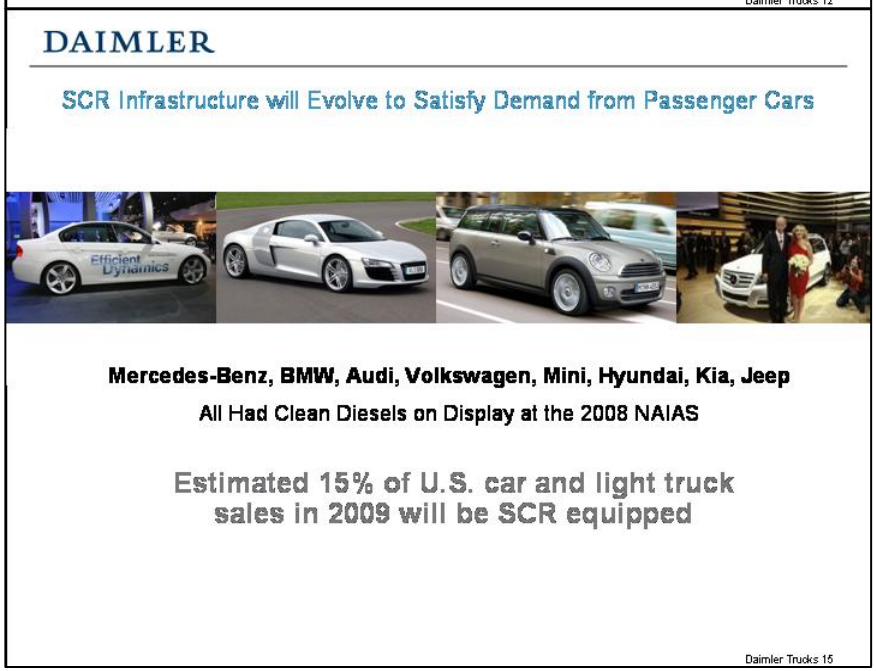
"It's been decades since government requirements led to the introduction of technology that is as <u>good</u> for business as it is <u>good</u> for the environment."



The fine art of creating doubt

What has become clear is that the main challenge we face today as we move toward 2010 is not one of technology, but of education. To many in the industry, just surviving in the face of today's increased fuel prices is all consuming. Who has time to worry about what happens in 2010? Who has time to study the various potential technologies? These things are far down the list of concerns for most truckers right now. Which means the vast majority of North American truckers are not familiar, yet, with the technology issues, and choices, coming down the pike.

And that makes miss-information campaigns, and scare tactics, easy. We saw it in Europe before the SCR launch there, and we are seeing exactly the same thing here now. It would appear, however, that here the practice is being raised to a fine art.

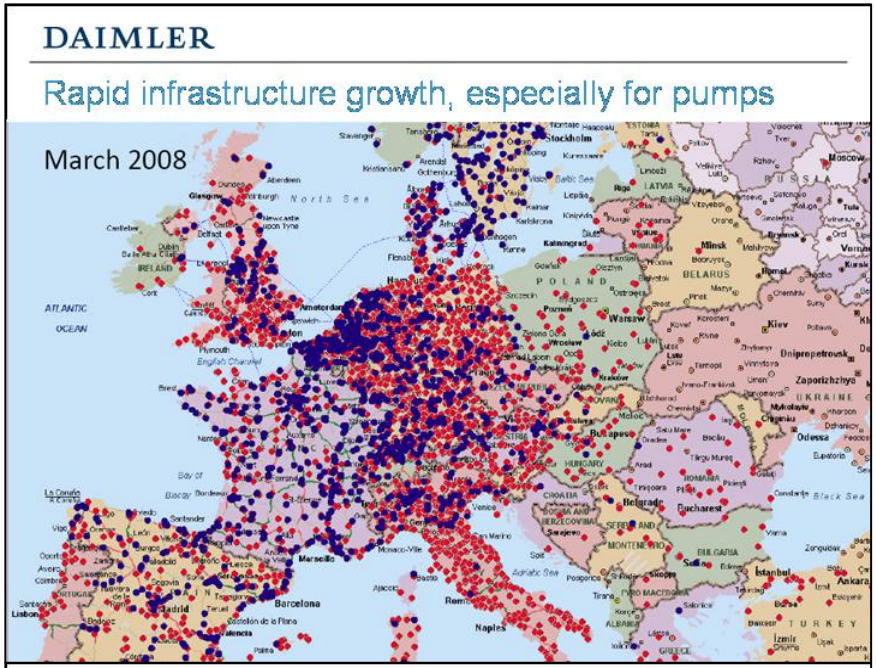


What is just beginning, is the education process.

SCR growth and understanding will be driven in part by applications outside of trucking. The technology is commonplace today in cleaning emissions from power plants. SCR cars and light trucks will also be hitting the highways this year.

In fact, SCR is expected to dominate the light truck scene, and may represent as much as 15% of car sales in the US within just a few years. Point in fact … Clean Diesel was all over the Detroit auto show this year, with SCR playing a leading role. Volkswagen, Jeep, Hyundai, Kia, Audi and BMW all had SCR vehicles on display, in addition to Mercedes.

So there is an education process ahead for many of us. What you can know for certain, however, is that in automotive car, bus and truck applications, Daimler's track record with SCR technology is unmatched.

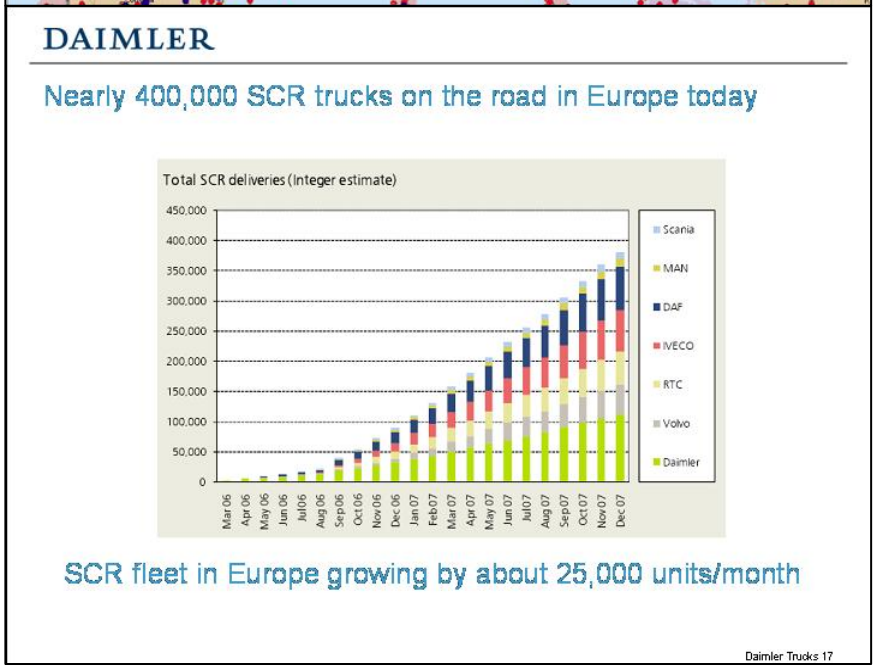


Education starts with addressing the open questions

So let's take a moment to look at some of the questions that have been raised relative to SCR's coming introduction to the North American truck market. I'd like to start with one that seems to be a favorite among those who will not be offering SCR on their 2010 products – DEF availability.

One of the primary arguments against SCR from EGR engine developers is that finding DEF on the road could be difficult. I guess we can't blame people that aren't involved with DEF for being ignorant of the activity behind the scenes, so we look to the ramp up of AdBlue availability in Europe as a case study.

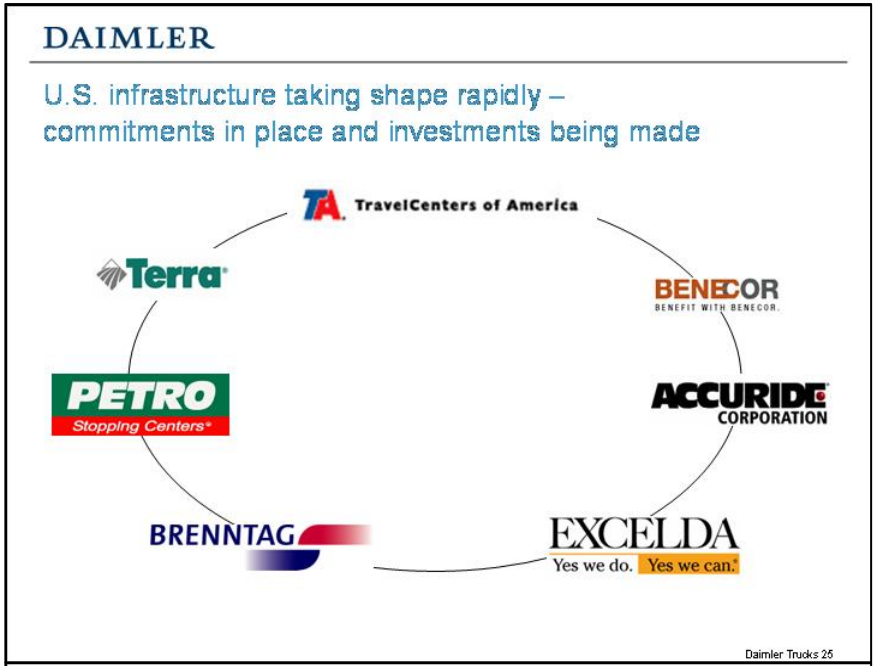
The fact is, most of the perceived SCR issues will simply vanish once the technology actually hits the road.

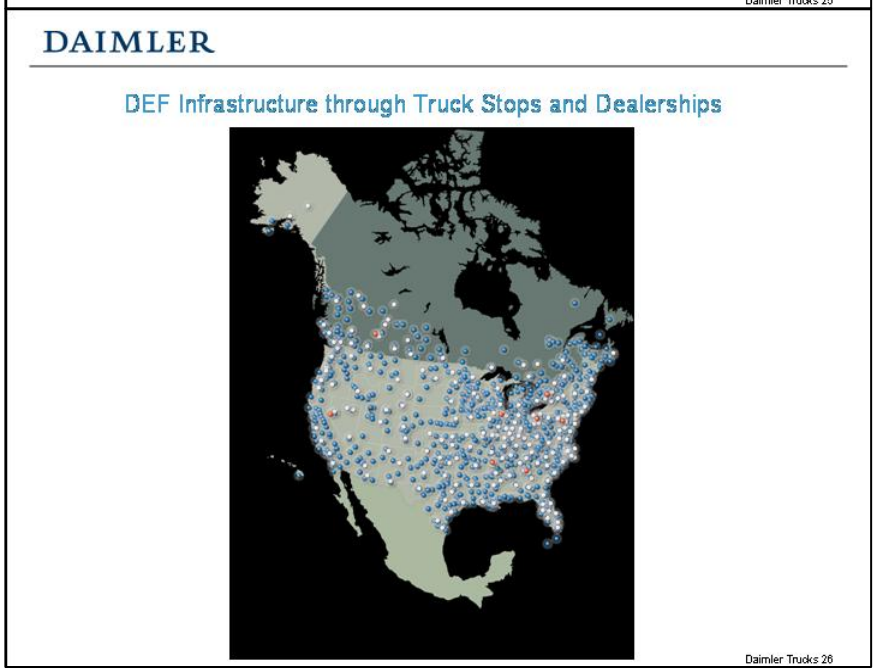


Today, Europe is equipping its trucks with SCR technology at an incredible pace.

Early 2008 reports from Integer-Research show new truck additions (registrations) averaging 25,000 trucks per month. In just two short years, between 2006 and 2008, the industry grew from 30,000 vehicles to more than 500,000 heavy duty SCR trucks. And reports show the SCR adoption rate is continuing to climb as more and more companies upgrade their fleets.

As we look toward the more stringent performance requirements ahead, SCR makes even more sense, especially with fuel prices at an all time high. In North America, as in Europe, being able to say you have the cleanest possible diesel technology while simultaneously pocketing 3-5 percent in fuel savings is simply too good to pass up.





So, how's it going to work in North America?

A number of recent announcements from infrastructure participants about alliances and investments being made to ensure DEF availability underscore the progress being made.

The DEF manufacturers, the distributors that supply liquids to thousands of dealerships today, the packaging companies that do this in their sleep and the truckstops that absolutely understand how to dispense fluids to truckers, all say this is pretty vanilla.

The preparation for 2010 is in full swing and they are all working quietly together to bring this to fruition here by 2010. Look at some of the activities so far. Earlier this year, we took delivery of 9,000 gallons of urea to support first fillings for OEM testing in Detroit. Since last autumn, suppliers have quadrupled their product handling infrastructure and capacity and have added expensive filtration and off-loading equipment to meet the expanded purity requirements for automotive grade DEF. They are also busy establishing relationships with some of the nation's largest oil change and lubrication companies.

The fact is, Daimler Trucks North America has over 850 locations where DEF will be available.

Add truck dealers, diesel distributors and service points of the other OEMs committed to SCR, and there will be over 1700 points of DEF supply going in to 2010. With a range 5,000 – 6,000 miles, or nearly twice the width of the whole country, one would have to work pretty hard to run out of DEF.

But of course there will be many more outlets than that. What about truck stops – you might ask?

In the near term, Daimler Trucks and TA will be working to establish the first two fully functioning DEF supply stations around mid-year. One will be in Detroit, the other on the west coast. These stations will initially support our test fleet vehicles, but will also serve as prototypes to better understand DEF pumping and distribution requirements for heavy trucks.

Putting it all Together

To sum up, at Daimler Trucks North America, and on behalf of our fellow OEMs including Volvo Trucks North America and Paccar, we are 100% committed to bringing our customers the best trucks for business and the environment.

And we're investing heavily to get there. What we began with the advanced aerodynamics and cooling of the Cascadia, and further advanced with the DD15's turbo compounding and ACRS fuel system, we will advance yet again with the introduction of our next generation BlueTec, SCR clean diesel in 2010.

All of these elements – truck, engine, and emissions technology – were designed to operate together as a single, integrated system. That means better fuel efficiency, better cooling, better performance all around.

SCR will play a major role in our industry's future – that's a certainty.

But as I said, the toughest remaining issue is not the technology. And it is not the infrastructure. The only real issue remaining, and the toughest ground to cover, will be education. And that, of course, is why we're here and why we're committed to helping all stakeholders in the SCR community in any way we can.

Thank you.