

KENSHIKI FORUM



LEXUS: INTRODUCTION

BY SPIROS FOTINOS, DIRECTOR, LEXUS EUROPE

Hello and Welcome to Lexus.

2020 marks an important milestone for our Brand in Europe as it has been 30 years since we entered the most competitive automotive market in the world.

In 1990... Lexus debuted in Europe with a single model - the LS 400 - which at that time, redefined what a luxury car should be - in terms of craftsmanship, performance, and advanced technologies.

30 years later, we celebrate over 1 000 000 units sold in our region.

And almost half of them - electrified!

Our advanced hybrid powertrains - introduced with the RX back in 2005 have paved the way in making electrification an attractive solution for European luxury consumers.

Today, hybrids account for 96% of our sales in Western Europe.

And that growing demand for electrification is one key factor that has helped drive 6 consecutive years of volume growth.

In this challenging year, our quick response to the pandemic in combination with the strong customer focus and resilience of our retailer network allowed us to consolidate our market share and set the foundations for the post-COVID environment.

Through the pandemic, we have seen an increased consumer focus on reliability, quality, craftsmanship and personalized service - all of which are core Lexus strengths.

This has further boosted loyalty among our customers... and fuelled record levels of brand consideration.

Our growing product desirability and a class leading guest experience delivered by the industry's most customer focused retail network have resulted in even higher conquest rates, as we continue to increase the amount of first time Lexus owners.

30 years ago, we set out to redefine what buying, driving and owning a luxury car feels like.

And, to this day, the most important question we ask at Lexus is - how do we make you feel?

As the world shifts and consumers seek more emotional connections with brands, our DNA has never been more powerful.

And this makes us excited and ambitious when we look at our future in Europe.

We are ready to meet the opportunities of electrification and new mobility - with several new or renewed models planned for the upcoming years, including plug-in hybrids and of course, the expansion of our EV offering.

We will also bring new and exciting technologies, which will give a unique personality to Lexus vehicles.

And to give you a very exclusive preview, let's head to our Headquarters in Japan, and hear about them from the source.

LEXUS: DEEP DIVE

BY:

TAKASHI WATANABE, CHIEF ENGINEER, ELECTRIFIED VEHICLES

KOICHI SUGA, GENERAL MANAGER, LEXUS DESIGN DIVISION

TOSHI HAYAMA, MODERATOR

Watanabe:

Thank you, Spiros-san!

Hello everyone! My name is Takashi Watanabe and I'm in charge of the Lexus Electrification project.

Today, with the help of our moderator, Toshi Hayama, I'd like to share my vision of Lexus Electrified with you.

Europe is leading global electrification and an important market for Lexus, so we wanted to share our electrification plans with you first.

Hayama:

Hello and welcome everybody.

My name is Toshi and I'll be the moderator today.

It's actually been one year since Lexus announced their electrification plan at last year's Tokyo Motor Show.

Since then Lexus has released the UX EV, which has gotten a lot of attention.

But today I'd like to dive a little bit deeper into Lexus's broader plans for electrification.

And I had the rare opportunity to drive some of the development vehicles on a track.

But in order to find out what their ideas and plans are, we invited one of the key people behind it, Mr. Watanabe, who is in charge of electrification.

And we'll dive a little bit deeper into an interview to find out what he has to say.

Hello Watanabe-san.

Watanabe:

Hello and thank you for today.

Hayama:

OK, let's begin, what is the goal of developing electrification?

Watanabe:

At Lexus, we want to use electrification and related technologies to create vehicles that elevate the original potential of the car.

We focused on natural acceleration that is tuned to the senses, as well as vehicle movement and response according to steering.

We'd like to continue improving this performance.

The biggest characteristic is the use of a new drive force technology that takes advantage of the excellent response from the motors, and independently controls the four wheels to enhance vehicle dynamic performance.

We'd also like to evolve this traction technology.

We call it, DIRECT 4.

DIRECT 4 stands for "DIRECT 4 Wheel Drive Force Control" and it allows us to change vehicle movements by controlling motor torque of the four wheels at will.

In addition, we'd like to involve the Lexus DNA of comfort, and the creation of a relaxing environment that evokes a sense of confidence.

Hayama:

So, what exactly is DIRECT 4 technology?

Watanabe:

Put simply, it's a system, that controls drive force created by the electric motors and channels it to the front and rear wheels.

That's why it's not just limited to EVs. For hybrids, a front engine with hybrid transmission combo is essentially an engine plus motor set-up on the driving wheels.

For the rear, we can use an electronic axle, or e-Axle.

With this, the front and rear can now produce electric driving force, and that is how we can apply DIRECT 4 to hybrids.

Hayama:

Now, as we dive deeper into Lexus electrified, I'm standing in front of two experimental development vehicles, with DIRECT 4 technology installed into current generation chassis.

Today we are going to have Watanabe-san explain to us what DIRECT 4 is and how it will affect the future of Lexus driving signature.

I can't wait to get on the track right now, so let's get straight into it.

Watanabe:

Right now, you're driving in front wheel drive, or front-wheel drive mode...therefore, it's a standard front-wheel drive car and will tend to understeer...

Hayama:

You're right.

Watanabe:

We'd like to use this electrification technology and drive force control to further advance performance and the dynamic Lexus Driving Signature.

Hayama:

I changed the settings for the four wheels to add more driving force to the rear, so give it a try.

Wow, I can't believe this is the same car! Amazing!

What a strange feeling. It's like driving a totally different car.

Watanabe:

We can change the ratio of drive force too.

Hayama:

Wow!

The turning characteristics... What!?

Watanabe:

The vehicle movements change considerably according to drive force.

Hayama:

I need to change the timing of turning the steering wheel.... What is the torque split on this now?

Watanabe:

It's about 50:50

Hayama:

It handles completely differently.

I can't believe this is possible.

Watanabe:

Isn't it cool? Now, we switched again, so the rear will use even more drive force.

It's about a 2:8 ratio and 3:7 when you're on the throttle.

Hayama:

Ahh, it is different.

The feel of the cornering G 's...exiting the corner feels totally different.

It's just like a Rear-wheel drive.

Watanabe:

Your driving line will definitely change too.

The nose will dive smoothly giving you a good slip angle, then the rear will push you forward.

It looks like you prefer a setting closer to rear-wheel drive.

Hayama:

Really?

Well, it feels really good...DIRECT 4 technology.

I understand that the difference in driving force changes the car so much, but how do you actually control it?

Watanabe:

Being able to use a large amount of torque at will, and another big point, there is only one drive shaft per motor that directly connects to the wheel.

By taking advantage of immediate motor torque that is transferred to the wheels as driving force, vehicle movement can be controlled based on this.

This is the main feature of DIRECT 4.

Hayama:

So, I know you are developing DIRECT 4 applications and this time, I was able to see a development vehicle.

This has a powerful motor in the front and rear correct?

It looks like a very fun car. So, are front and rear motors more powerful?

Watanabe:

Since torque is instantly transferred to the wheels after pressing the throttle, it can definitely produce powerful driving performance.

Hayama:

So does that mean it's easier to precisely control EVs?

Watanabe:

Electrified vehicles can offer responsive drive force control, so I think the world will be full of hybrids and EVs.

Hayama:

I now understand that electrified driving will become more interesting, but will all cars eventually become EVs?

Watanabe:

For regions where EVs are not the easiest to use and infrastructure is lacking, there are still many areas like that, so, according to the appropriate needs of those regions, Lexus will focus on hybrids in order to provide choices for the customer, with PHV, EV, and eventually multi-fuel options such as FCV for the future.

We would like to further advance technology with electrification at its core.

Hayama:

The evolution of Lexus Driving signature and dynamic performance through electrified technology...

I'm looking forward to all the new products coming out.

Watanabe:

Yes, thank you.

Hayama:

So, we've just heard how electrification will affect the driving performance of vehicles, but let's take a look on how electrification has the potential to change design.

So, we've actually invited a key person today, and so let's talk to him about the future of Lexus's design.

I spoke to Watanabe-san about the impact of electrification on driving performance but how will that affect design?

Suga:

Design is not only about styling, it's also based on engineering and expressing it as a shape.

That's what we consider design to be. But with electrification, I wanted to take a step closer to the essence.

The spindle grille I discussed earlier, well, until then, people said Lexus had no face but after lots of trial and error, the spindle grille shape became the unique, functional expression of Lexus.

But with electrification, Toshi, as you may already know the engine cooling radiator is eliminated because there is no engine.

So, making something new with our designs, something never seen before... I think it's a chance to express our unique designs.

Hayama:

Yes, I wonder how they'll express that.

Suga:

Rather than a specific shape or something, it's more about expressing the technological foundations in three dimensions.

That's what we are working on, so I think there's a lot to look forward to.

Hayama:

Yes, I'm really looking forward to it, I'd like to see it.

Suga:

Yes. Also, with regards to performance.

I think it's an opportunity to think about Lexus design.

The modelling expression that comes from driving force is not something we would think of right away, like from a train or something.

It's not that simple.

Gaining inspiration from Lexus driving for a unique modelling expression is exactly what I'm working on with my team now.

The new vehicle movements made possible by electrification are something you are now trying to express as a shape.

Yes, since we not only use words, but try and express that as a shape, the concepts that we spoke about today might have a chance to be seen in the near future.

Hayama:

Yes, that would be very exciting.

Thank you so much for all the great stories.

Suga:

No, thank you for the opportunity.

Hayama:

So, what do you think?

Today we got a first glimpse into electrification technology at Lexus.

But moving forward, we'll be sharing with you more about all of the technologies that Lexus is working on.

And we are very excited to bring that to you.

So once again, thank you for today, and we're looking forward to seeing you soon.

ENDS.