KENSHIKI FORUM 2022

PLENARY SESSION

ROBERT TICKNER

Welcome / Housekeeping / Schedule / Embargo timing

MATT HARRISON

Good afternoon, ladies & gentlemen, and a very warm welcome to our fourth annual Kenshiki Forum.

As the global automotive sector witnesses a 'once in a century' decade of transformation, it is clear, when it comes to societal shifts, and ambitious mobility and environmental goals, that Europe is the most rapidly changing region in the world.

The pace of change we are seeing in both customer expectations and regulatory obligations is quite simply, unprecedented.

And it comes at a time when we are already facing many other significant challenges.

The seemingly never-ending impact of Covid ...

The prolonged conflict between Russia and Ukraine …

The continued supply chain disruption resulting from the global semi-conductor shortage …

And hyper-inflation at a level that we have not seen in decades.

These factors are impacting businesses and private con sumers alike, and there is no doubt that they are now having a major effect on confidence, investment, and spending.

It's against this challenging backdrop that we must consider our responsibility to meet these consumer needs ... and deliver for the environment.

Back in 2015, at the timing of the Paris Agreement, Toyota set out its commitment to be carbon neutral globally by 2050.

And earlier this year, Toyota was certified by the Science Based Targets initiative (or SBTi) as meeting the 1.5 degrees standard for its global Scope 1 and 2 reduction targets.

This independent confirmation illustrates that we are on the right path to meet our global carbon neutrality commitment for 2050.

When you consider our global footprint, which includes many countries where the implementation of the necessary environmental initiatives is not so straightforward, this is a massive commitment.

However, here in Europe, it is clear that many of the key enablers are being put in place to support a faster transition.

As such, we have an opportunity to accelerate our plans ... and today, for Europe, I can confirm that our ambition is to reach full carbon neutrality by 2040 – a decade earlier than Global Toyota.

There are essentially three key phases to that journey.

The first is to be carbon neutral across all our manufacturing plants and corporate facilities by 2030.

The second is to be ready for 100% of our sales in the EU, UK and EFTA markets to be zero emission vehicles by 2035.

And the final step is to secure carbon neutrality across our purchased goods and services … and our logistics operations by 2040.

This means that for elements that are totally within our control – i.e. Scope 1 and 2 – we will already be carbon neutral in Europe by 2030.

However, to achieve Scope 3 by 2040 – which includes those areas outside of our direct control – the challenge is much greater, and we need strong external collaboration to get there.

This is one of the reasons that we have established our annual Sustainability Forum … with a diverse range of key stakeholders … including suppliers, think tanks, academia, Government representatives and NGOs to openly discuss these challenges and the innovative ideas that are required to solve them.

Between now and 2040, we in Europe must travel the fastest and the furthest of all Toyota regions.

As such, we have an important role to play in leading the electrification acceleration and carbon neutrality ambitions for Toyota globally … and let me confirm to you that we are excited to be the pioneers in finding the answers to some of the biggest questions facing our industry, and our global organisation.

Solutions that will deliver a sustainable business, as well as our commitment to the environment and to society.

To realise these ambitions, here in Europe we have developed a comprehensive, cross-company business strategy … and it is called 'Going Beyond for 2030'.

Today we will focus on two key elements of that strategy …

The first is Carbon Neutrality and how we plan to achieve it across all areas of our business.

And the second, as we transition from a manufacturing and sales company to a provider of mobility services, is the future of Mobility.

To explain our approach to Carbon Neutrality, I am delighted to be joined by Gill Pratt – Toyota's global Chief Scientist … by Kylie Jimenez, our Senior Vice President of Corporate Affairs here in Europe … and by Marvin Cooke, our European Executive Vice President of Manufacturing and Supply Chain. This is so we can give you an insight into both our global thinking … but also the concrete actions we are taking locally here in Europe.

Later, I will also be joined by Dr James Kuffner, CEO of Woven Planet Holdings and Chief Digital Officer of Toyota Motor Corporation, to talk about how we see the future of Mobility.

But, before we look forward, let's begin with the current realities that we are facing … and with a quick overview of our business performance and short-term outlook.

Like everyone else, we failed to anticipate not just the magnitude of continued supply chain disruption … but also the major geopolitical and economic events that lay ahead.

These have led to a significant downturn in the market.

But against this backdrop, we have shown incredible resilience and determination, and I'm very proud to say that we expect our 2022 full-year sales result – for Toyota and Lexus combined - to be close to 1.1 million vehicles.

This represents a small but important improvement in sales compared to last year, despite the European market falling by nearly 12%.

I'm particularly pleased with our market share.

We have continued to outperform the market and expect our CY22 market share be close to 7.3%, which is 0.9 points above last year … a record for us … and confirms Toyota as the #2 automotive brand in Europe.

In this respect, we have already achieved our 2025 market share ambition that I previously shared with you.

Looking forward to 2023, due to the uncertain supply outlook, I am reluctant to give you a sales forecast commitment – but I can say that we expect to see further volume and market share growth.

On reflection, we have been able to perform better than many of our competitors through this period of turmoil … and I believe one of the key contributors to our success has been our multi

technology approach … which has enabled us to meet a very diverse range of customer needs in this fast-changing environment.

There are, however, some areas of our business that have been severely impacted by this supply disruption.

For Lexus, there's no denying that 2022 has been a very tough year, with sales significantly lower than last year.

This is a result of two key factors.

In the East, the conflict in Ukraine led us to stop all sales in Russia – previously our largest market for Lexus in Europe … accounting for more than 25% of our Lexus sales.

Sales were also temporarily suspended in Ukraine, but successfully restarted in the summer, thanks to our resilient Ukrainian network … and amazingly, today they are operating at about 50% of last year's volume.

In the West, we have simply not been able to keep supply in line with demand due to parts shortages.

With all Lexus models for Europe produced in Japan, we have experienced significant production cuts on key models … including the new generation NX … a model that was central to our growth aspiration this year.

Our order banks however remain high, so we are confident that when supply limitations ease … our Lexus growth momentum in Europe will continue.

Next year we will start deliveries of the new generation RX – our flagship SUV, which has been completely reinvented … and also of RZ, our first BEV on the e-TNGA platform.

Together with NX, these three models represent our strongest offensive yet in the D-E premium SUV segment … and form the heart of our growth strategy … by providing a choice of plug-in hybrid, electric, and hybrid.

On top of this … in this privileged group, I can also share with you that there will be some very exciting product news coming from Lexus next year… with a special focus on Europe.

Looking forward … you can also expect more technological leadership from Lexus.

Last year, Akio Toyoda explained that Lexus will lead our corporate electrification efforts … and this is much more than a powertrain story.

How do we reinvent the driving experience in an electric era?

How do we make enthusiast drivers smile at the wheel of electric cars by providing something truly fun to drive?

This has become the mission of Lexus and its engineers.

Today, I'd like to show you one of the vehicles that they're working on.

You will see… that when we say that driving pleasure is central to our thinking … we mean it!

Ladies and Gentlemen … let me introduce you to the Lexus Electrified Sport!

< Reveal – Lexus Electrified Sport >

This amazing concept is our vision for a full electric high-performance sports car … capable of accelerating to 100 km/h in little more than 2 seconds.

It also showcases a new evolution of our design language … matching superior aerodynamics with intriguing elegance and attention to the smallest details.

When you have the chance to take a closer look at this model later today you will see – it is a work of art!

The dynamic capability of the Electrified Sport will of course be developed on the racetrack … and benefit from our relentless search for ultimate performance in motorsports.

During the Lexus deep dive session later, we will share more information about our next generation electrification technologies … and for that we are very pleased to have the Chief Engineer of Lexus Electrified, Mr Takashi Watanabe with us today.

Watanabe-san, thank you very much for joining this Kenshiki event.

Although Lexus will lead our global thinking in terms of electrified technology development and implementation … it's the Toyota brand that will bring volume and accessibility … through the rollout of our bZ electric vehicle line up.

Last year, when we premiered the bZ4X, I told you that it was just the beginning.

At that time, I was not able to share any details – or clarify how many bZ models there would be … or by when we would launch them.

However today I can confirm that we plan to have 6 bZ models on sale in Europe by 2026.

More than that, I can also give you a preview of one of them.

Ladies & Gentlemen let's take a look at another future member of our bZ family – the bZ Compact SUV Concept.

< Reveal - bZ Compact SUV Concept reveal >

This bZ Compact SUV Concept illustrates our desire to develop vehicles that are not just battery electric powered, but also created using low-impact, sustainable materials.

Cars that bring dynamic performance … leading technology … and stylish design.

The design language of this concept SUV is purposefully futuristic … and pushes the wheels to the corners to create an aggressive stance.

Short overhangs and body creases are intended to make it stand out as an advanced technology vehicle.

It includes sustainable, eco-friendly touches, like seating that is made from plant-based and recycled materials.

Both of these cars – the Lexus Electrified Sport and the Toyota bZ Compact SUV – indicate our clear commitment to battery electric vehicles.

There is no doubt that BEVs will play an ever-increasing role in the transition to 100% zero-emission vehicles by 2035 in Europe.

But we believe it's too early, and perhaps too risky for the environment … and for our customers … to put all our ZEV eggs in the BEV basket.

Furthermore, in the transition decade that lies ahead, we believe it's important to continue to offer low emission solutions to all our customers, so that nobody is left behind.

We will therefore maintain our strategy of deploying as many technologies as possible … and offering an increased range of hybrid and plug-in hybrid solutions.

This strategy began 25 years ago with the launch of the first-generation Prius.

And I think it's fair to say that there were some doubts that hybrid would become mainstream.

Nevertheless, we continued our journey … and the technology and know-how that we developed over the last 30 years now enables us to offer an increasingly wide portfolio of accessible and efficient electrified products.

Today, hybrid remains a trusted and powerful differentiator for Toyota - especially here in Europe.

And in the future, we believe the same will be true of hydrogen technology.

The opportunity for hydrogen goes way beyond light vehicles and we're seeing a marked acceleration in interest across all transport sectors, especially from markets that are looking to secure energy independence, like Germany.

To learn more about that (and the importance of a diverse electrified line-up), let me welcome Gill Pratt, our Chief Scientist.

GILL PRATT

Thank you, Matt.

Today I'd like to address two questions.

The first is why we see so much promise in hydrogen, particularly for larger vehicles like trucks, which carry 77% of all freight transported over land in the European Union.

The second is why we believe that in order to reduce carbon as much as possible, as soon as possible, it is essential to both make millions of ZEVs by 2035, and to offer other electrified powertrains that fit diverse circumstances.

Before I get to these questions – I want to clearly state – Toyota is committed to Battery Electric Vehicles. And BEVs will play an important role in helping us get to carbon neutrality. Yet other electrified powertrains are also necessary to reduce carbon emissions as much as possible, as soon as possible.

Now let's talk about hydrogen.

As these figures show, hydrogen has benefits where lithium batteries are weak and visa-versa.

Grey hydrogen, shown on the bottom left, is produced today at an enormous scale to make fertilizer – enough for millions of vehicle fill-ups yearly.

We know that grey hydrogen will need to be replaced with more environmentally friendly options.

Luckily, there are several alternatives that show promise from turquoise to green.

So, we are confident hydrogen will become one of the important tools used to combat climate change.

Beyond its uses today, we believe hydrogen will be used in the future in steel- and cement-making and for storage of renewable energy, where it is ten times less expensive at scale than batteries.

This is because, unlike batteries, hydrogen decouples the scale of the storage tank from the scale of the energy conversion device.

At Toyota, we also see significant potential in vehicles, particularly larger vehicles, where hydrogen's lower mass and faster refuelling are essential.

Let's do some simple math to see why.

To compete with diesel, a typical large European truck needs around 1 MegaWatt-hour of propulsive energy storage.

This is 10 times what is required by a long-range lightweight BEV.

As a result, large truck BEVs take ten times more average power to recharge.

European trucks take around 6 minutes to fill at a typical pump, whereas a comparable BEV takes 60.

So, to handle the same demand, each diesel pump will need to be replaced by ten electrical chargers, each ten times higher power than a lightweight BEV charger, for a total average power of 10 MegaWatts.

Many truck stops have several diesel pumps, which raises the equivalent electrical power to several 10s of MegaWatts.

How much power is that? Here's a way to get a feel for it.

A home's average electrical use during the day is about 2.5 kiloWatts. So, 10 MegaWatts of power is the equivalent of 4,000 homes.

And that's just for one diesel pump equivalent. Remember that a truck stop may have several.

The current electrical grid was not designed to deliver this level of power to truck stops and will require tremendous investment and time to evolve.

By contrast, hydrogen can refuel a truck as quickly as diesel, with the same number of pumps.

This is one of the reasons Toyota believes in the promise of hydrogen.

Now let's turn to why, despite our firm commitment to ZEVs in some parts of the world, we believe other electrified powertrains are also necessary.

Let me start with a sobering reality about some of the critical materials used to make battery cells.

Lithium prices are presently at an all-time high – over $50,000 per ton, a factor of 10 higher than just two years ago.

Some of this is because of geopolitical events, but mostly it is because of quickly rising demand, underinvestment in mines over the past decade, and the time it takes to bring new mines online.

As Simon Moores of Benchmark Mineral Intelligence said in the Wall Street Journal, "It takes 4 to 7 years to build a lithium mine. It takes only 24 months to build a battery plant. These two parts of the supply chain don't live in the same time zone."

What are the repercussions of these shortages on climate change?

Can we wait until the battery materials supply improves?

Unfortunately, the answer is no.

The carbon we emit now will not only harm us – it will also harm our children, and grandchildren, and our great-great-grandchildren.

This is because carbon dioxide remains in the atmosphere for a long time - up to 100 years.

So, we must lower carbon emissions as much as possible, as soon as possible.

How can we reduce carbon now, in an era of battery material shortages and less-than-adequate charging infrastructure?

By purposefully distributing the limited numbers of battery cells we produce where they will do the most good – in BEVs where that is most appropriate, but also in a diversity of other electrified powertrains where that is best.

Here's why.

Many of you have seen charts like this one, from the ICCT, comparing the lifetime carbon emissions rate of different types of vehicles.

But it is only when battery materials and energy charging infrastructure are plentiful that it makes sense to take this kind of microeconomic view and focus.

When battery materials, as well as renewable energy charging infrastructure, are scarce, we need to employ systems thinking and consider things from a different perspective …

… a macroeconomic perspective.

Let's take a look at a specific example.

Let's start with 100 non-electrified vehicles, shown in orange, with a typical lifetime emissions rate, considering both manufacturing and operating emissions, of 250 grams of CO2 per kilometre.

Now let's take 100 kiloWatt-hours of lithium battery cells, and consider three different scenarios for distributing those cells:

First, let's use those battery cells to replace one of the hundred non-electrified vehicles with a long-range BEV, shown in blue, whose lifetime emission rate is 100 grams of CO2 per kilometer.

That blue BEV looks great, doesn't it?

But because we've used up our entire battery supply to make just 1 BEV, the result is a fleet average of 248.5 grams of CO2 per kilometer – nearly that of a non-electrified vehicle.

Now let's consider an alternative scenario - let's use those same battery cells to replace 6 of the hundred non-electrified vehicles with an 18 kiloWatt-hour PHEV, shown in pink, whose lifetime emission rate is 150 grams of CO2 per km.

The result is a fleet average of 244 grams of CO2 per km. This is better than 248.5, but the vast number of undisplaced non-electrified vehicles still dominates the result.

Finally, let's use those same battery cells to replace 90 of the hundred non-electrified vehicles with 1.1 kiloWatt-hour HEVs, shown in green, whose lifetime emission rate is 200 grams of CO2 per km.

The result is a fleet average of 205 grams per km - close to the carbon emissions of the HEV and the lowest average by far.

Besides utilizing their batteries better, HEVs are also more affordable, easier to recycle, and don't require charging infrastructure – a good match for a large part of the world's population in the coming 15 years

We can debate the lifetime average carbon emissions numbers for each vehicle type, but the result won't change significantly because the dominant factor is the different numbers of non-electrified vehicles displaced, not the exact lifetime emissions of each powertrain type.

This is the fundamental rationale for Toyota's diverse approach. We want to distribute the limited supply of battery materials where they will reduce carbon emissions as much as possible, as soon as possible.

During the coming 10-15 years of battery materials shortages, precious battery cells should not be squandered in long-range BEVs driven short distances between. Rather, battery cells should be put where they will do the most good.

Does this mean that hybrids and plug-in hybrids should be used instead of ZEVs everywhere and forever?

No.

There is plenty of lithium and other materials in the earth, and after fifteen years or so, we expect the output of mines and refineries to catch up. Recycling will also come into play. And as time goes by, we expect renewable energy charging infrastructure to increase significantly, making ZEVs more practical.

In parts of the world like the Netherlands that already have ubiquitous renewable energy charging infrastructure, it makes sense to go ZEV sooner, as long as battery packs are sized to maximize cell utilization.

The point is that around the world, vehicle owners are incredibly diverse. They use their vehicles in different ways. They live in markets with different energy supply mixes. And they have access to very different levels of charging infrastructure.

Amidst this diversity of circumstances, one cannot expect a single powertrain to offer the optimal solution everywhere.

In summary, I hope you can see why Toyota's plan for the next 10-15 years is to offer diverse powertrains for diverse circumstances, to reduce carbon emission as much as possible, as soon as possible.

That is why we say that carbon is the enemy, not a particular powertrain type.

With that, let me turn it over to Kylie.

KYLIE JIMENEZ

Thanks, Gill.

The power of diversity is something we're embracing all across the entire business, not only in powertrains...

On our journey to develop a different kind of business – a business that seeks to create mobility and happiness for all - we need to make sure we maximize the range of mindsets, perspectives and thought processes. How to do this? Well, for us, it means an increased focus on diversity, equity and inclusion. In fact, we believe it is such a competitive advantage that it has become a top priority in our regional strategy and our ambition is to become the global leader for DEI within Toyota.

And it's why all our leaders across Europe have DEI in their business plans, with concrete actions covering a broad range of diversity priorities from LGBTQ, to age, race and ethnicity, physical disability, neurodiversity, and gender.

And there are already proof points to illustrate our progress.

For instance, our hiring ratio of women has risen from 36% to 45% over the last 2 years.

But we recognize that the talent pool of female candidates for engineering in automotive is scarce.

There simply aren't enough women choosing STEM careers.

In fact, only 18% in Europe!

So, while we are targeting the women and other diverse groups in our attraction strategy, we are also focusing our efforts on increasing the pipeline of women in STEM because just 26% of schoolgirls are interested in STEM subjects.

Studies have shown that this can almost double when kids have a role model!

So, knowing this, what did we do?

Well, through our girls STEM the future program, we have been working to change stereotypes for girls in schools.

Our own female Toyota role models interact with schoolgirls in classroom sessions, on-site visits at our Research & Development centre and innovation camps to see what it's really like to work at Toyota and raise young girl's aspirations.

And... despite only 18% of women choosing STEM careers in Europe, our efforts are paying off!

Last year 37% of our hires in R&D were women!

But what might surprise you is the results we are getting in our manufacturing plants.

In Poland, we have reached 30% female representation from entry level, right through to shop floor leadership.

Turkey took up the challenge this year and within just this year we have moved from 3% women on the shop floor to 11%.

Which means that just over 1 in every 3 new hires was a woman.

It's my hope that when people think of the success, we are having at TME, it will be understood that it's *because* of our diversity advantage.

This is not the only area where Toyota Motor Europe is taking the lead.

As Matt mentioned earlier, our ambition in Europe is to reach Carbon Neutrality a decade earlier than global Toyota, which means... 2040.

With that in mind we have established bold carbon neutral vehicle and manufacturing commitments.

Firstly, when talking about vehicles, as Gill mentioned, we believe the enemy is carbon, not any particular powertrain.

The real goal is to reduce carbon emissions as much as possible, as soon as possible.

Toyota is one of only 2 global companies selling in over 170 markets around the world…. and I believe it's clear that not all of those markets will be ready for zero emission vehicles at the same time.

For instance, here in Europe – one of the most affluent regions in the world - the speed of transition varies greatly.

In Greece, where GDP is relatively low, the infrastructure is currently at less than 1 charging point per 100 km.

Even in Poland, where GDP is higher, the number of points per 100km is still less than 1.

And, in Norway, where you might believe there is wide availability, the northern region of Finnmark has only 5 charging points per 100km, and the resultant take-up of BEVs is very much lower than in Oslo, which has 162 per 100km.

So, how should we respond to customers in Greece, Poland and the north of Norway today?

Our belief is that the most responsible thing to do is provide them with an appropriate solution that allows them to reduce their carbon footprint NOW.

AND that's why we offer: battery electric vehicles,

AND fuel-cell electric vehicles,

AND plug-in hybrids,

AND hybrids.

We call this the 'power of AND' because rarely does one size fit all, especially when you consider the diversity of customer needs and infrastructure readiness.

This approach ensures that nobody is left behind in the quest to reduce carbon emissions and illustrates why we see an ongoing key role for hybrid and plug-in hybrid technology in the years to come.

...And what better way to illustrate that commitment than with the vehicle that started the hybrid revolution - and went on to sell over 5 million worldwide?

Please join me in welcoming the all-new Prius.

< Reveal Prius Unexpected >

Wow, what a great looking car!

As you can see, it has a bold and attractive style that connects to Prius heritage.

But also brings it bang up to date with Toyota's design language, as highlighted by the hammerhead front face.

It's slippery too – which, of course, helps to minimise consumption and maximise range.

But it's what's going on under the skin that has the biggest impact on efficiency.

Reinforcing its role as the 'halo for hybrid', the new Prius is the first vehicle in our portfolio to combine our new 5th-generation hybrid technology with plug-in capability.

The result is around 70 km of EV range, which is more than enough for the majority of daily journeys - and beyond.

Of course, it's our hybrid halo, but we also think of Prius as an EV - with the backup and reassurance of an incredibly efficient hybrid system if needed.

We believe that's how many of our customers will see this car.

The new Prius will allow them drive as an EV for the vast majority of their journeys.

And, at the same time, remove anxiety when they're not able to plug-in for any reason.

Yes, it's yellow, so let's address the yellow elephant in the room…

And I'm not talking about my jacket. You might be thinking "how hard was it to find a jacket the same color as the car?" … Well, not so hard actually! I bought it about a couple of months ago before I even knew the color we'd have for the Prius.

The truth is that the color is super "on trend". Now some of you who don't follow the trends might have thought 'New York taxi' – I know, I did when I first saw it…

And… indeed, you're right…. many mobility providers have previously chosen Prius due to its legendary efficiency and durability.

But today mobility providers are able to choose from a wide range of vehicles in our portfolio such as Corolla, Camry, RAV4 plug-in, bZ4X and Mirai – depending on their local environment and their customer's needs.

This again illustrates why it's important and beneficial to have a diverse range of low carbon solutions – this time ensuring that no mobility provider gets left behind….

Likewise, on the journey to carbon neutrality, we're committing that no area in our business will be left behind, including our manufacturing facilities where we have accelerated targets and have brought forward some really creative ideas.

To tell us more about that, please welcome our Executive Vice President, Marvin Cooke…

MARVIN COOKE

Thank you, Kylie.

As you've heard, our commitment to reducing carbon goes beyond the vehicles we sell.

On our European path to full carbon neutrality by 2040 we have a key target of bringing all of our manufacturing facilities to be carbon neutral by 2030.

When you consider the geographic spread of our facilities, and the diverse environments in which they operate, I'm sure you can imagine how the techniques we develop here could be implemented all around the world.

So, let me give you an overview of what we've achieved so far.

Our general approach is to minimise energy consumption as much as possible, and at the same time, switch to renewable energy.

Our actions are already having a dramatic impact, and this year we expect to reduce our overall carbon dioxide output by around 4750 tonnes.

Let me give you a few examples of what we've done.

In our plant in Walbrzych Poland, we've implemented a heat recovery system that ensures as much thermal energy as possible can be recycled.

The implementation of special rotors and highly-efficient fans means that we've been able to reduce our energy consumption by 82%, which is around 12000 megawatt hours – or, in other words, enough energy to power and heat over 1000 homes for 1 year.

And, of course, 82% reduction in energy consumption means 82% saving in carbon emissions.

Similarly, in our plant in Burnaston, UK, we've implemented a heat recovery system in our paint booth that allows us to reduce energy consumption by 96%, which again directly translates into a 96% saving in carbon emissions.

This last initiative recently received a global award for best Kaizen idea within Toyota.

These innovative ideas are already being implemented in other plants to similar effect – and not just here in Europe.

In parallel, we've been working to secure our much-reduced energy need from zero emission or carbon neutral sources.

A good example of this is our approach to our plant in Deeside, UK.

There, we have installed solar panels equivalent to 10 football pitches to give us a good supply of zero emission electricity, and we're collaborating with a local company to process more than 90% of our waste to generate biogas which will be used to produce green electricity and biomethane.

We can see that this approach is working very well. In fact, in the case of Deeside, we expect this plant to be carbon neutral as early as the end of 2025.

So, I'm confident we will deliver on our commitment of carbon neutrality for all of our European plants by 2030.

But maybe now you're wondering what we're going to be producing in that timeframe….

Well, let me give you a glimpse into one of our next steps…

For many years we've been producing hybrid vehicles in Europe, with an increasing number of locally manufactured hybrid systems and components.

Today, we're announcing that for the first time we're also going to start assembling batteries in Europe.

We are now preparing for the supply of plug-in hybrid batteries for a new model to be launched during the course of next year.

I can't tell you the details of the battery size, nor the volume we intend to produce.

But what I can do is give you a preview of the all-new model that will come with a plug-in option…

When we set out to design the new C-HR, we made a promise that we would stay true to everything that has made it an icon.

By making a bold car even bolder, and even more attractive.

Right now, I have the opportunity to show you that this is a promise that we are keeping.

Ladies & Gentlemen, please welcome the new C-HR prologue

< Reveal C-HR prologue >

'prologue', as I'm sure you know, is typically an indication of what's to come next.

And that's exactly what we want to convey with this model.

Just like Aygo X prologue from last year, this C-HR prologue model gives you a strong indication of how the next generation C-HR will look.

And, as I suggested earlier, we're ready to confirm that the new C-HR will come with a plug-in hybrid variant with a battery pack assembled here in Europe.

There will also be a hybrid version that will use our latest hybrid technology.

You've probably noticed that C-HR prologue has a clear connection to the bZ Compact SUV Concept.

This is not by accident.

These two vehicles will be launched into the largest and most competitive market sector in Europe – the segment we call 'C-SUV'.

C-HR prologue will appeal to those looking for hybrid or plug-in hybrid solutions.

And the bZ Compact SUV Concept will appeal to those looking for a full electric solution.

Together, they confirm a continuation of the wider electrification strategy of leaving nobody behind that Kylie mentioned earlier.

And, as previewed earlier, we believe hydrogen is certain to play a stronger role in our strategy.

To tell us more about our strategy for hydrogen, let me welcome Matt back on stage.

Thank you.

MATT HARRISON

Thank you, Marvin.

You've just heard about how our manufacturing area is making great progress towards carbon neutrality.

And now, I'd like to elaborate on how we are planning to leverage hydrogen on that carbon neutrality journey.

Gill shared why we see so much promise in hydrogen … Why it is increasingly clear that hydrogen is going to form a key part of Europe's energy strategy … And why there is a growing appetite to accelerate.

To help speed up the expansion of hydrogen technology, we are pursuing a strategy that extends far beyond passenger cars … and is based around three main pillars – Light vehicles, B2B and the creation of new Ecosystems.

Regarding light vehicles, our Mirai fuel cell sedan is now in its second generation, and there are a growing number of localized fleet applications where Mirai is being used to great zero-emissions effect.

For example, Paris has the world's largest fleet of zero-emission hydrogen-powered taxis with over 600 Mirai's. Similar initiatives can also be found in Copenhagen, Berlin and Hamburg.

And we are now also exploring expansion of hydrogen technology to other passenger vehicles where fuel cell can deliver a competitive advantage.

At the end of this week, we will announce the prototype development of a fuel cell Hilux, in conjunction with four UK engineering partners and supported by the UK government.

Development is progressing well and we're moving ahead with preparing small-scale production in our plant in Burnaston.

The second pillar is heavier duty b2b applications – where Gill has already highlighted the significant benefits.

We have many projects under way – particularly in the truck, bus, rail and maritime sectors … as well as stationary power generators.

Our automotive partnerships include developing a fuel cell city bus with Salvador Caetano and the supply of our 2nd generation fuel cell stack to Daimler, for their Mercedes-Benz Ecitaro bus.

Turning to the maritime sector, we also recently worked with Energy Observer Development (or EODEV) to successfully integrate our fuel cell technology into the Energy Observer boat, ahead of its emissions-free crossings of the Atlantic and Pacific Oceans.

We also partnered with EODEV to create hydrogen power generators - an example of which was recently used to light-up the Eiffel Tower in Paris.

The third pillar in our hydrogen strategy is to create new Ecosystems.

This means teaming up with like-minded partners to establish sustainable hydrogen partnerships and solutions.

One good example is in Germany, where we are working with the green hydrogen provider, GP Joule, and our bus partner, Salvador Caetano to expand supply and infrastructure.

It's a model which we would like to repeat elsewhere – with two objectives in mind.

Firstly, accelerating the distribution of preferably green hydrogen … together with the required infrastructure.

And secondly, enabling the development of mobility-related applications with each stakeholder.

By working with partners to create this interdependency, we can develop a stronger business model and support communities that want to further expand into fully fledged hydrogen corridors.

Our hydrogen ambition is clearly resonating with an increasingly wide group of customers and our fuel cell business unit is inundated with requests for collaboration.

To meet this increased demand, we are already assembling our 2nd generation fuel cell modules in Brussels and plan to expand local production into one of our European manufacturing plants as the demand increases.

This is why Hydrogen leadership is a key pillar of our Going Beyond roadmap … and our strategy to achieve Carbon Neutrality by 2040.

Now, I can't close the hydrogen topic without mentioning the other opportunity that we are exploring.

I'm talking of course about hydrogen combustion.

I'm sure that those of you who joined our last Kenshiki forum remember the hydrogen GR Yaris.

For certain, you recall the noise, and the excitement – almost like we had discovered the holy grail … keeping everything we love about driving today but delivering it in the zero emissions world of tomorrow.

Since then, our engineering teams have been working hard to further develop the technology and have been testing at a number of endurance races.

Here in Belgium, I joined Akio Toyoda at the WRC Ypres Rally a couple of months ago, where he personally drove the hydrogen GR Yaris along the rally route during the weekend.

Let's hear what he had to say …

I think the smile on his face tells you all you need to know about how the car performs and, importantly, how it sounds.

The progress in hydrogen combustion technology development has been rapid over this last year.

For instance, during this season's highly demanding endurance races in Japan, we were able to increase engine power by 24% and improve torque by 33%.

And we were able to significantly reduce the refuelling time from 4m40s to 1m30s.

We're now at the point where we're transferring our learnings from motorsport into a prototype road car for everyday use.

By combining fuel cell packaging technology from Mirai, and state-of-the-art high pressure direct injection combustion technology from our Gazoo Racing activity, we have created a hydrogen combustion version of the Corolla Cross.

It can accommodate 5 passengers – and, because the hydrogen tanks are installed under the floor, it can accommodate their luggage too.

We are probably about 40% along the path to commercialization … and I don't know if we'll reach all the way to 100% … but clearly, it's too early to stop trying; and definitely, there's a big opportunity in motorsports.

If we do get there, then – like the Corolla Cross - maybe there's also a hydrogen combustion solution that can contribute to meeting the future ZEV mandates.

I'm sure you have many questions about hydrogen combustion; and I'm therefore delighted that we're joined today by Minami-yama san from Gazoo Racing to provide answers to your questions during this evening's dinner.

Our Gazoo Racing organisation is at the forefront of our hydrogen combustion development activity.

Led by Koji Sato, under the direction of Akio Toyoda, Gazoo Racing continues to enjoy great success on the world's motorsport stage.

At the beginning of this year, Nasser Al-Attiyah and Mattieu Baumel secured the Dakar rally title in their GR DKR Hilux.

They went on to win the inaugural World Rally Raid Championship titles – a fantastic achievement against some very capable opposition.

Then, in the World Endurance Championship, we again secured Driver and Constructor titles … including a fantastic 1-2 finish for the GR010 hypercar at Le Mans.

Personally, I'm very excited at the prospect of an expanded hypercar entry list for next season and can't wait to see the cars in action in the Le Mans centenary race.

Winning the world championship titles in World Rally Raid and World Endurance this year is already reason enough to celebrate.

But it's the addition of the World Rally titles too that gives us cause to be especially proud.

What a remarkable performance from Kalle Rovanpera in his #69 GR Yaris R1.

Just one day after his 22nd birthday, Kalle became the youngest-ever WRC Driver's Champion.

We knew he was good – but, wow, what an achievement.

Congratulations to Kalle and his co-driver Yonne, and of course to the team that so ably supported them both on the way to bringing home the WRC Manufacturers title.

A triple crown of success for Gazoo Racing in 2022 … and an exciting future ahead as we cascade our learnings and technologies from motorsports to help us make ever-better cars.

Now, you may have noticed that Kinto is a key sponsor for our motor-racing activity … and it's a different kind of mobility that I'd like to talk about next.

As I mentioned earlier, as a company we are in a transition phase – from a manufacturing and sales organisation to a mobility provider.

As part of that process, we're developing Kinto – our dedicated mobility brand.

Kinto aims to be a one-stop-shop for mobility services, offering customers a broad choice of solutions tailored to suit wide ranging mobility needs.

There are currently around 500 employees working at Kinto and we have subsidiaries in Spain, Italy, Germany, UK, France, Poland, and Portugal.

Kinto One, our full-service leasing business that represents the cornerstone of our operations, is already active in over 10 countries across Europe, with a portfolio of more than 150,000 units on operation.

I'm very pleased with the progress that we've made … and that the decisions we took have already helped us create a profitable business.

But let me explain where we want to take Kinto next.

After a period of evaluating several pilots in different European countries, we are now entering a phase of 'Focus & Scale'.

Kinto One, Share and Flex, our respective full lease, car-sharing and flexible vehicle subscription solutions, are the ones we will prioritise over the next three years … and we will work to standardise these selected services throughout Europe.

Regardless of where a customer is, or whatever their mobility needs are, each one of them should have a similar and seamless experience.

And that experience should come at a price that is fair and affordable.

We believe affordability can only be achieved by thinking differently about vehicle ownership over its life.

This is something we refer to as Vehicle Lifetime Value.

Customers of Kinto One, our full-service leasing activity, increasingly expect us to handle more of their mobility transactions – to get to the point where they simply have to pay a monthly fee and not worry about anything else.

This is an opportunity to optimise cost, improve customer experience and reduce environmental impact.

We have big ambitions with Kinto.

And key to scaling our Kinto businesses, and leveraging the opportunity of Vehicle Lifetime Value, will be our long-term partners and our wide retailer network.

Together, we intend to double the Kinto business from 150,000 units in operation today to 300,000 by 2025.

This is what we're doing here & now … with existing vehicles, infrastructures and environments.

But, as you're aware, Toyota is already looking way beyond today and towards the future of mobility.

To explain more, please give a warm welcome to the CEO of Woven Planet Holdings, James Kuffner.

JAMES KUFFNER

Thank you, Matt.
Good afternoon, everyone.

Today, I am excited to introduce Woven Planet to you, and to share with you a glimpse of Toyota's automotive technology strategy and where Toyota is headed in the future, particularly with regard to software.

For thousands of years, humans have been moving, building things, communicating with each other, and thinking.

Transportation technology has dramatically improved how people move – allowing us to move much further and faster than our biological limits.

Manufacturing technology has dramatically changed the precision and scale with which humans can build things.

And we have all lived through the recent information technology revolution that has transformed how we communicate with each other – instantly anywhere, anytime, around the world.

And finally, new technology for artificial intelligence is fundamentally transforming how humans think and process data.

If you put all these things together, you get intelligent, connected, automated vehicles.

This is why it is such a tremendously exciting time to be working in this industry today.

What lies at the heart of this revolution is the computer.
The computer is what many consider to be the most complex machine that humans have ever created. In fact, today's computers cannot be built without a computer.

But it is more than just a single computer. We have created data centers – millions of networked CPUs and data storage units.

The modern networked data center, or “cloud”, allows us to compute solutions to problems that were unthinkable even a short ten years ago.

If we add the power of computers to electromechanical systems, we can create programmable physical machines that can reason about and interact with objects in the physical world.

And of course, I am talking about robots in their many forms - from industrial arms - to anthropomorphic service robots - to connected, autonomous vehicles.

And these intelligent machines can now leverage the incredible computing infrastructure of the cloud.

Distributed fleets of connected vehicles and connected robots can now wirelessly access near limitless amounts of remote computation and cloud data storage.

And what powers this amazing new computing infrastructure? Software.

Software and digital technology is revolutionizing the automotive industry and the future of mobility.

What do we mean by mobility?

At Woven Planet, we think about three different types of mobility - the Mobility of People, Mobility of Goods, and Mobility of Information.

Throughout the COVID pandemic, people have embraced new kinds of digital technology to support remote work, remote learning, and on-demand delivery of food and packages.

But mobility is more than just physical mobility.

I think what is also very important is the emotional aspect of mobility, which is, “I am moved.” Toyota has always strived to build products and services that bring people joy and happiness.

In other words, how do we move people’s hearts?

Our vision is Mobility to love, Safety to live.

We aim to deliver the safest, most reliable human-centered mobility for all. Mobility that customers love and trust.

But Toyota and our entire industry is facing an enormous challenge: How can we deliver high-quality automotive software at scale?

I would like to share with you, our approach.

One - we are creating new software platforms and tools, processes, and a culture shift to software-defined development for Toyota. This will improve productivity by delivering software that allows for scalability and the reuse of code across the hundreds of Toyota and Lexus models.

Two - we are providing Toyota with the ability to deliver end-to-end

digital experiences to customers.

We are developing state-of-the-art automated driving and advanced safety technology that complements human driving skill.

In 2021, we launched the Lexus LS 500 hybrid and 2nd-generation Mirai fuel cell electric vehicle with Woven Planet's Teammate automated driving technology, which enables Advanced Drive and Advanced Park functions on these vehicles.

Advanced Drive provides ramp-to-ramp Level2+ automated driving on highways with hands-off capability, fully integrated with our advanced safety systems.

In addition, all Advanced Drive software can be updated via wireless communication over-the-air, making it possible to improve usability and provide the latest safety technology even after the vehicle is delivered to the customer.

In 2022, Woven Planet Teammate Advanced Drive won the Japan Industrial Technology Award for innovation that helps reduce driver fatigue and enhance awareness.

We are also developing next generation production solutions for advanced safety and autonomy for both personally owned vehicles as well as future mobility-as-a-service Level 4 autonomy products.

However, through our experience in developing and launching these products to the market, we learned that it is not sufficient to develop solely the automated driving software components in isolation.

Instead, a robust software development platform and tools are needed to enable automotive engineers to efficiently deploy high-quality software across multiple vehicle models without compromising safety and security.

Woven Planet is building such a platform.

We call this platform 'Arene'.

Arene embraces a “Software Defined Architecture” approach to designing vehicles that solves some of the industry’s biggest challenges such as managing the rapid increase in software complexity at a massive scale, and the costs associated with the development of advanced automotive software.

Software Defined Architecture – or SDA – enables software and hardware components to be developed independently and reused, shortening the lead time of product development, and unlocking potential new value to customers over the vehicle lifetime.

This approach has already revolutionized the PC industry, the mobile phone industry and soon – it will transform the automotive industry.

Arene’s SDA design enables Toyota and Lexus to deliver powerful new features, improved satisfaction and happiness to customers worldwide, all without compromising our tradition of quality craftsmanship, safety, reliability, and long-lasting value.

But perhaps nothing better captures Toyota’s bold investment in the future of software and technology to support human-centered mobility than the Woven City project.

Woven City aspires to become a unique proving ground to accelerate innovation and deliver the world’s future mobility at scale.

Officially announced by President Akio Toyoda in 2020. Woven City is a seven hundred thousand square meter site at the base of Mt. Fuji.

The ground-breaking ceremony was held in February 2021, and the building construction is now underway, and we expect to complete construction of Phase 1 by 2024 and begin mobility testing by 2025.

When completed, Woven City will be a unique, human-centered, ever-evolving “living laboratory” that will allow us to accelerate development and testing of integrated solutions for our increasingly digitally connected cities.

As a test track, it will speed development of mobility technology, smart agriculture, clean energy, and healthy living all powered by software with security and privacy built-in to its design.

We have exciting plans to test new services such as electric personal mobility, automated goods delivery, flying mobility, and smart sustainable energy generation and storage.

Last year, we announced a partnership with ENEOS to explore the utilization and application of hydrogen energy at Woven City, and ultimately leverage renewable hydrogen to make Woven City a model of sustainability.

Some of you may be wondering what is the meaning and significance of the name “Woven”...

The name Woven is a tribute to Toyota’s rich history as an automated loom company, and the founding spirit of striving to create technology and products to help other people.

When technology amplifies human potential, oftentimes that technology or product is beloved by people, because they feel gratitude to be helped.

Many Toyota customers love their cars - cars that provide safety, security and amplify their ability to move. Some customers even name their cars.

Through software and services, we will expand mobility and continue to make products that people love, and we will work together to create benefits for society.

In closing, to be human is to move. Throughout history, mobility has propelled social progress.

And together, with Toyota we will never stop innovating around mobility.

I look forward to sharing more about our unique approach to transforming mobility through software during the upcoming deep dive session.

Thank you so much for your attention. Back to you, Matt.

MATT HARRISON

Thank you, James.

I believe we all agree that mobility is a basic human right.

Some go further and say that humans have an intrinsic need to be mobile…. and without that ability there is a risk to wellbeing.

In this regard, Toyota is committed to putting customers first and serving society as a whole.

This mission stems from Toyota's earliest values and principles and explains why we are focused on the future of sustainable mobility.

This is what we mean when we talk about 'Mobility for all' and 'Happiness for all'.

As James explained, we are working at speed on the key technological enablers of future mobility – including higher levels of autonomous capability, fully-digital evaluation environments, and Woven City – a working laboratory or 'test-course', where new technologies and developments can be validated in the real world.

Arene, our forthcoming software platform, is central to this activity and will help us accelerate the rollout of future zero-emission products.

Today there are millions of cars and drivers around the world, including approximately 450 million here in Europe.

We want to serve all of those people in the best way possible.

Many of them cannot afford a zero-emission vehicle today.

Or they don't yet have reliable access to a charging or refuelling infrastructure.

We also know today that the industry cannot build a BEV for everyone given the time required to increase the supply of lithium and other key elements.

But, as Gill highlighted, in order to minimise carbon emissions, everyone in the world must participate - now.

We need ecological solutions that are accessible to everyone.

Because carbon is the enemy, not any particular powertrain.

Environmentally friendly cars can only contribute to the environment if they are popularised.

And from that viewpoint, our range of hybrid and plug-in hybrid cars also have an important role to play.

They are cars for the masses, not for the few.

Beyond zero emissions, a brighter and happier mobility future awaits us all.

But the journey needs to start today, not tomorrow.

Whether the technology is battery electric, plug-in hybrid, fuel cell, hybrid, hydrogen combustion or some yet-to-be-discovered technology, we commit to make every effort to offer better mobility solutions for the majority of people in Europe and around the World.

Thank you for taking the time to join us here in Belgium today, and I hope you enjoy the deep dive sessions.

ROBERT TICKNER

Embargo & deep dive instructions