

Toyota Mirai Fuel Cell Sedan Global Media Preview

- Takeshi Uchiyamada

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Thank you John, and good morning everyone.

I am so happy to be here at the Balboa Bay Club...for all the wrong reasons.

I am a sailing enthusiast and of course a car enthusiast.

On one side of the hotel is the ocean and so many beautiful boats.

On the other, we are surrounded by exotic car dealerships.

I know this town has been known for generations as... New Porsche-Beach.

But from what I've seen since I arrived... McLaren-ville might be a better name.

I am going to begin with a story that many of you have already heard, because it is the reason why we are gathered here today.

In the early 1990's, gasoline in the US cost cents per gallon, not dollars per gallon.

It was then that Toyota committed itself to answering the question; *what will mobility look like in the next century?*

The answer, was actually two answers, joined forever along similar paths.

Short- to mid-term, the future would be the gasoline-electric hybrid, and it would all begin with the Toyota Prius.

I was personally challenged to bring to market the world's first gas-electric hybrid with mileage twice as good as a comparable five-passenger family sedan at the time

And I was told that we must do it in 36 months.

We succeeded in meeting this very demanding deadline.

But I knew that the journey we would take along the second path could not be demanding to happen.

Some might say... I was not demanding enough.

However, I knew the challenges ahead.

This was science... and it would take time... If we were to do it right.

Prius means "go before"... and for nearly twenty years, Prius paved the way... by demonstrating to mainstream buyers... that the future in mobility would include electric motors.

But...“the future” that Prius went before... will be the car we will talk about today... the Toyota Mirai hydrogen fuel cell... electric vehicle.

The Toyota Mirai...is a four-door, midsize sedan.

It can be re-fueled at a typical gas station in about three to five minutes... travel about 300 miles between tankfuls...and do zero to sixty in around 10 seconds.

If that sounds a little like the Prius, or any other “normal” car, you would be correct.

The difference, of course is that this car uses no gasoline and emits nothing but water vapor.

The gas-electric hybrid technology in the first Prius blazed a new trail, that many critics said could not be blazed.

The hydrogen fuel cell technology in the new Mirai—will do the same.

So....why hydrogen? Why in the world are we so focused on hydrogen... especially since there’s nowhere to fill up?

Yet...which we will get into a little deeper...later this morning.

The simple answer lies in an *elegant* process that bonds oxygen and hydrogen... to create water and power... and nothing more.

Hydrogen is the lightest element on the periodic table and the most abundant element... in the universe.

It’s easy to find and there are many ways to produce it; most commonly with natural gas, but more recently and more often using renewables such as wind, solar, geo-thermal and bio-waste.

When compressed, it has a much higher energy density than electric batteries... and is easier to store and transport.

Often forgotten, is that... Hydrogen is the primary *gas*... in the word *gaslight*.

And from the early eighteen hundreds into the 20th century, gaslights lit much of the world’s streets and roads... and homes... long before electricity.

Of all gases that could be used back then, Hydrogen was deemed the easiest and cheapest to produce... and among the *safest* to use.

And it’s still that way today.

When compared to drive batteries the rate of cost reduction in fuel cells has been rapid...over the last 10 years.

We believe this trend will continue and that FCV costs will decline faster than BEVs for about the next decade.

We see the Toyota Fuel Cell System in the new Mirai...as simply...a better battery.

Functionally, the system works like a battery...that is constantly being charged by the introduction of Hydrogen and Oxygen.

It has a cathode and an anode, just like a battery.

The stack makes electricity on-demand to power the electric motor.

In the process, it transforms about 10 pounds of Hydrogen into about 10 gallons of zero-emission water vapor.

If we were to build a current-technology Lithium battery pack capable of powering the Mirai 300 miles it would be much larger in size and weight than the Mirai's fuel cell stack and hydrogen tanks...and require hours instead of minutes to recharge.

Hydrogen fuel cell technology is scalable.

We are using small ones in our Toyota forklifts and large ones in our Toyota buses.

They are already being used broadly as stationary generators and most recently in aviation, in place of batteries.

Hydrogen, and Hydrogen fuel cell technology will be a societal and economic game-changer.

Gasoline has been the primary fuel for the first 100 years of the automobile.

I believe that Hydrogen will be the same for the next hundred years.

In fact, I believe we, as an industry are close to realizing a Hydrogen-based society well beyond the transportation sector.

It won't happen over-night.

It took nearly a decade before Toyota hybrid sales hit one-million globally.

Only seven years later...we have sold seven times that.

The biggest issue remaining is the development of convenient and reliable re-fueling infrastructure, well-coordinated with the volume and location of vehicle sales.

In fact, the ultimate success of fuel cell technology, will depend less on the genius of the car, than it will on the *ownership experience*.

Toyota will deliver on both the car...and the ownership experience...especially during the challenging early years of product roll-out.

This will happen region by region, based on a wide variety of market conditions and government regulations.

For example, California—the world's 8th largest economy—is accelerating with funding the build-out of 100 fueling stations in key regions .

Toyota is already assisting in the construction of 19 of these new stations.

Last night, Mr. Lentz confirmed that Toyota will also contribute to the construction of 12 stations in five northeastern states.

In response to these commitments, Toyota will direct a large portion of Mirai's production volume over the first few years...to the California and Northeast US regions.

As demand for vehicles emerges or increases in other regions committed to infrastructure, Toyota will respond.

In fact, we believe our production volume, will steadily increase from about seven hundred in 2015 to the tens of thousands in 2020s.

By that time, we believe that fueling infrastructure will reach sustainable growth as a business model.

Mirai sales will begin in about a month in Japan.

Europe and North America will begin later next year.

Soon, a small assembly line in our Motomachi plant in Toyota City will roll off the first Mirai.

And then, the pieces...will begin to come together... to someday take the form and function of a true Hydrogen Society.

For more than 20 years, Mirai has been a dream... that will soon be a reality.

I am not allowed to say how many, but I can tell you that many brilliant people have spent most of their career at Toyota, working on fuel cell research and development and looking forward to the launch of Mirai.

They believe that Hydrogen will be the fuel for the next century and that the Mirai—"the future", is where we will truly begin.

Thank you.