

# 2010 Los Angeles Auto Show - Toyota RAV4 EV Reveal

November 17, 2010

Good afternoon everyone.

I must begin today by offering an obvious bit of history. Fourteen years ago, Toyota staged a press conference right here at the LA Convention Center to unveil its latest battery-electric vehicle ... the RAV4-EV.

The conventional RAV4 had already established a significant place in automotive history when in 1994 it introduced a revolutionary concept the world's-first true car-based SUV. Compact in size yet exceptionally roomy, the RAV4 blended the ride-comfort and handling of a sedan with the sporty image and cargo-hauling-versatility of an SUV. And we saw it as the perfect platform for an all-electric vehicle.

Powered by a massive nickel-metal hydride battery, the RAV4-EV had a range of 80 to 110 miles on a single charge, which with its dedicated 220-volt home charger ... required about 8 hours from fully depleted to fully charged.

The RAV4-EV's arrival to market in 1997 signified Toyota's fully committed response to the California ZEV Mandate, requiring a small percentage of "zero-emission" vehicles to be sold in the state by full-line manufacturers.

In the six years of its run, Toyota was able to lease or sell only 1,484 RAV4-EVs.

Enthusiasts loved it.

Mainstream buyers ... not so much.

Today, nearly 750 are still in operation.

It is relevant that the launch of the RAV4-EV also happened to coincide with the arrival of an even more revolutionary product, the world's first gas-electric hybrid vehicle ... the Toyota Prius.

At less than half the price ...and with no loss of convenience ...Prius was able to convince millions of mainstream consumers that the electrification of the automobile was possible, reliable and affordable.

Back then price and convenience proved to be critical success factors and they remain so today.

But much has changed in the last few years.

Most importantly, the growing level of awareness that sustainable mobility will come at a cost that must be shared by the automakers, government, and the consumer.

Toyota's approach to sustainable mobility focuses on the world's future reliance on mobility systems tailored to specific regions or markets rather than individual models or technologies.

It acknowledges that no one technology will be the winner and that a mobility system in Los Angeles will probably look very different from one in Dallas or New York or London or Shanghai.

Toyota's comprehensive technology strategy is a portfolio approach that includes a long-term commitment to hydrogen fuel cells, plug-in hybrids and battery-electrics all driven by the further proliferation of conventional gas-electric hybrids like Prius as its core technology.

Equally important to this strategy is the allocation of considerable resources to the development of advanced batteries, beyond lithium, low carbon synthetic fuels, the reduction of vehicle weight, coinciding with further improvements in passenger safety and further breakthroughs and major refinements in the efficiency of the internal combustion engine.

To bring these technologies to market is the easier part.

The difficulty has been and will continue to be delivering unconventional products to mainstream customers that are compelling and affordable and that offer an acceptable level of daily convenience.

To that end, Toyota focuses considerable effort on the development of public recharging and re-fueling infrastructure particularly with hydrogen.

In fact, in about a month a collaboration between Toyota, Shell and Air Products will culminate with the grand opening of the world's first public, pipeline-fed hydrogen re-fueling station in Torrance, Calif., adjacent to the Toyota Motor Sales national headquarters.

And tomorrow afternoon, Toyota will stage an environmental seminar in Tokyo where it will offer new information about its accelerated roll-out of conventional hybrids, its global roll-out plans for the Prius plug-in, recent advancements, in solid-state battery technology...a first-drive opportunity with its small EV urban commuter...and more detail about the fuel cell vehicle it will launch by 2015 ... or sooner.

Which brings us to how all of that is related to all of this.

Ladies and gentlemen, it is my pleasure to introduce the second-generation Toyota RAV4 EV ... powered by Tesla.

(REVEAL)

The word unique is meant to stand alone. No modifiers. No additives. Unique is unique.

In my 28 years with Toyota, I consider our collaboration with Tesla a unique project.

When we decided to work together on the RAV4-EV, President Toyoda wanted to adopt a new development model that incorporated Tesla's streamlined, quick-action approach. The result was a hybrid.

A new decision-and-approval process and a development style that our engineers refer to as "fast and flexible." Led by our Toyota Technical Center in Michigan, it is a model that has helped reduce development time without compromising product quality. They have accomplished this by approaching this project as they would a mid-cycle "major-minor" product change. To be more specific ... midway through a generation ... we begin with a fully engineered current-generation RAV4 ... to which we are adding a major powertrain option, along with minor feature and cosmetic changes.

The vehicle on stage is not only a strong product on its own, it represents a point-in-time in both the business relationship and the product development, aiming to bring a vehicle to market in 2012.

Many steps must be taken and milestones met before that happens.

The development team is currently engaged in the initial testing, validation and certification process referred to as Phase Zero.

By the end of this year, 35 demonstration vehicles –like the one we have here today –will be built for use in a Phase Zero demonstration program ... that will run through most of next year.

While Phase Zero vehicles are basically converted RAV4s. The Phase One vehicles we plan to bring to market in 2012 will be thoroughly re-engineered Toyota RAV4EVs.

The development team has been in place and on the job for the last six months.

Tesla is responsible for building and supplying the battery as well as other related parts and components that meet Toyota engineering specifications in performance, quality and durability Toyota is responsible for development and manufacturing leadership and the integration of the powertrain.

From the beginning, the "customer experience" has been the focus. In other words, how to deliver an unconventional product to mainstream customers that is compelling and ... affordable...  
... and that offers an acceptable level of ... daily convenience.

With an EV it all starts with range.

The Phase Zero vehicle is consistently achieving a 100-mile range based on actual road driving patterns in a wide range of climates and conditions.

The final driving range of the 2012 Phase One vehicle will depend on many factors still being considered not the least of which is battery size and design as it relates to useable power.

Extreme heat and cold will substantially affect battery performance.

Our development team has focused on mitigating these effects.

We would like to eventually expand the sales distribution of this vehicle into regions of the US that experience seasonal extremes.

From initial testing under severe conditions we believe this will be possible.

A large part of the team's focus on the customer experience targeted drive-ability.

Does it steer, accelerate, and handle like a conventional vehicle?

In this case the target is to end up with a vehicle with drive-ability characteristics as close to the conventional RAV4 as possible.

For example, the Phase Zero vehicle weighs about 220 pounds more than the current RAV4 V6 yet it will accelerate from zero to sixty nearly as quickly.

This added weight factor also required significant re-tuning of major components and a focus on weight distribution.

Not only were suspension and steering modified significantly major components needed to be re-located to better balance the increased mass.

Providing a compelling product is one thing. Creating an attractive value proposition is another.

The RAV4 EV will need to be competitive with other battery-electric offerings in both performance and price.

We believe it will offer both and that customers will see the RAV4 EV packaging, styling and versatility as a major purchase consideration.

There are many people here today that are directly responsible for moving this project forward.

I would like to introduce three of them who are most responsible for leading the way.

First, the person who helped design this unique collaboration with Toyota ...the President and CEO of Tesla Motors...Mr. Elon Musk.

Second ... the person who heads-up our Toyota Technical Center in Michigan ...Mr. Shigeki Terashi.

Last but not least ... the chief engineer for the RAV4 EV ...Mr. Greg Bernas.

Gentlemen thanks for joining us today.

Toyota has a long-term view of the auto industry. Because we know that new technology requires time to mature and refine. Equally important is the need to inform and educate consumers and prepare them for the arrival of a confusing array of unconventional products.

Yes this will be a very expensive program for Toyota but one of many necessary steps in moving the needle with a broader base of consumers toward sustainable mobility.

As I mentioned earlier many decisions regarding the product and the business model have not been finalized although we hope to do so soon.

Battery size and output for example, as well as Phase One pricing and volume projections, will require more time to confirm.

As for a final-assembly location, we are looking at many options and combinations.

The basic vehicle will continue to be built at our production facility in Canada.

Tesla will build the battery and many powertrain components at its new facility in Palo Alto.

How and where final assembly of the Tesla and Toyota components is conducted is still being discussed, so stay tuned.

I'm looking forward to see how the story unfolds as much as you.

Before we adjourn I'd like to ask Mr Musk, Mr. Terashi and Mr. Bernus to join me on stage and allow photographers to get a few pictures.

Thanks for joining us this afternoon.

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