

MIRAI

FUEL CELL VEHICLE



TOYOTA

ALWAYS A
BETTER WAY



MIRAI

BRINGING THE FUTURE INTO THE PRESENT

We've always imagined a time when driving a car would leave no mark on the planet we live on.

Twenty years ago, our vision took a step closer to reality when we pioneered hybrid technology. The flexibility of our hybrid architecture means it can be adapted to different powertrains – from plug-in hybrid to hydrogen fuel cell – offering us a wealth of opportunities for new developments in the future.

Toyota Mirai is at the forefront of a new age of hydrogen fuel cell cars. Hydrogen energy enables us to enjoy zero-emission driving, unlimited energy supplies from various sources and provides an intelligent solution to store energy.

Hydrogen technology truly represents a turning point in our future mobility and for our environment. Toyota is making a start today, bringing the future into the present.



WHAT IS A FUEL CELL VEHICLE?

Think of a fuel cell vehicle as a hybrid car where the petrol tank and combustion engine are replaced by a hydrogen tank and a fuel cell stack. This revolutionary new system does not operate with petrol, but with hydrogen – a fuel with fascinating qualities and vast potential for the future.

The hydrogen is stored in two tanks under the cabin of the Mirai and reacts with oxygen from the outside air to produce electricity. This electricity powers a motor that drives the wheels; and the best news is that the only by-product of this process is water, which exits through the Mirai's tailpipe.

As well as only producing water from its tailpipe, which means less impact on our planet, Mirai's feel-good driving experience is guaranteed to leave a lasting impression, on every journey.



0 EMISSIONS



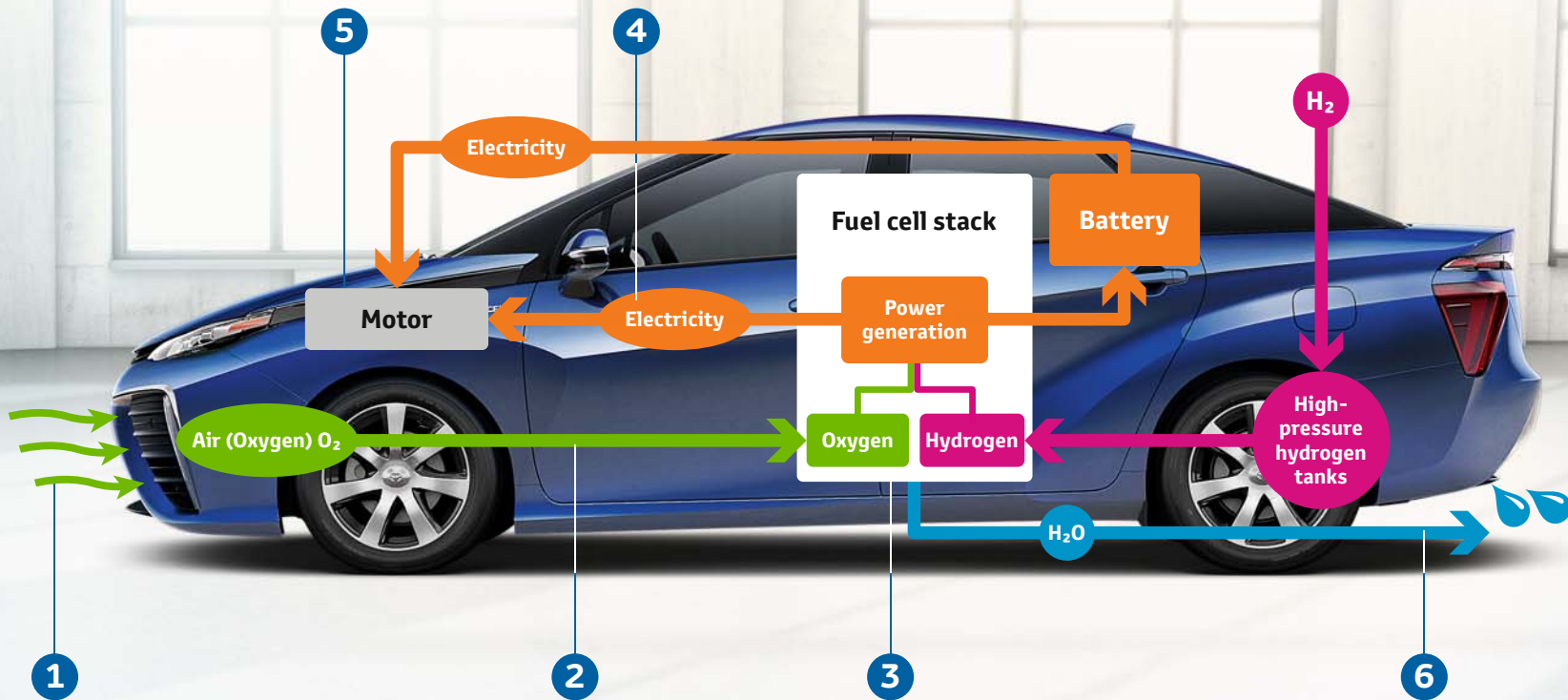
**REFUELLING TIME
3 MIN**



**RANGE
550 KM**

HOW IT WORKS

- 1** Oxygen from the air enters Mirai's air vents.
- 2** Hydrogen is delivered to the fuel cell stack.
- 3** Electricity and water are generated through a chemical reaction.
- 4** The electricity powers the motor.
- 5** The motor is activated and the vehicle moves.
- 6** The only by-product of this process is water.



SIMPLE TRUTHS

Q HOW DO I REFUEL A FUEL CELL CAR?

A You can refuel in approximately three to five minutes at a hydrogen station using a pump – much like a petrol station's – with no odour or risk of spillage.

Q HOW MUCH WILL IT COST TO FILL A FUEL CELL CAR'S TANK?

A. Today the cost is comparable to that of filling a petrol car's tank.

Q ARE FUEL CELL CARS COMPLICATED TO DRIVE?

A. No, a fuel cell car such as Mirai is as easy to drive as any other car. Mirai's incredibly quiet and smooth drive combined with responsive power and intuitive controls, means it's a particularly rewarding companion for long-distance drives.

Q ARE FUEL CELLS BETTER FOR THE ENVIRONMENT?

A Yes, due to the fact that they emit no harmful gases and other pollutants whilst driving (like CO₂, NO_x, HC and particulates) and only water from the tailpipe.

Q WHERE DOES THE HYDROGEN COME FROM?

A. Hydrogen is found in nearly everything, but it binds to almost anything, so before we can use it we have to strip it from other substrates including biomass, natural gas or electrolysis (from water). Hydrogen can be produced by the energy generated by wind, solar or hydro sources. This variety of origins provides us with a source of energy diversity and security.

Q IS HYDROGEN SAFE TO USE?

A While hydrogen should be handled carefully, a tank of pure hydrogen is safe: it is so small and light it disperses in the air very quickly. In fact, a leak of hydrogen gas would disperse quicker than a cloud of petrol or diesel vapour.

Q IS IT TRUE THAT FUEL CELL CARS DON'T WORK IN COLD CONDITIONS?

A This used to be true of earlier fuel cell systems, but a next generation car such as Mirai can start and operate normally in temperatures as low as -30°C.

Q HOW MANY HYDROGEN STATIONS ARE THERE IN EUROPE?

A By the end of 2015, we expect at least 80 stations to be in operation across Europe.

FUEL CELL SAFETY

For over 20 years we've been testing our fuel cell technology to ensure it meets our very strict safety standards, only then could we be sure it's as reliable as the technology in every other Toyota. Now, after covering millions of kilometres in some of the world's harshest environments, passing the strictest crash and fuel tank experiments and thousands of refuelling tests, we are ready for our fuel cell story to begin.

From the incredible strength of the carbon fibre hydrogen tanks and carbon fibre reinforced plastic fuel cell stack frame, to the impact-absorbing safety structure and intelligent hydrogen monitoring sensors – safety is such an important part of the Mirai that it sets new standards.

In addition, the Mirai comes equipped with a range of leading active and passive safety systems including: Pre-Collision System*, Lane Departure Alert, Rear Cross Traffic Alert, Auto High Beam, Blind Spot Monitor (BSM), eight airbags and extensive pedestrian impact-absorbing body panels.



* Technical name: Pre-Crash Safety System.





EXPERIENCE QUIET DRIVING FROM A PREMIUM POSITION

Step inside the Mirai. The futuristic cabin effortlessly combines comfort and convenience with innovative technology, lasting quality and everyday practicality.

Navigation, audio and hands-free calls are handled by the impressive 7" touch screen Toyota Touch® 2 with Go Plus navigation system, incorporating premium 11-speaker JBL sound. Located high up on the dashboard – at an easy glance from the heated leather steering wheel – are the comprehensive four-zone information meters. These provide the driver with clear shift status, warning light indicators and two 4.2" colour TFT screens with a range of configurable displays from speed and power meters, to audio and navigation instructions.

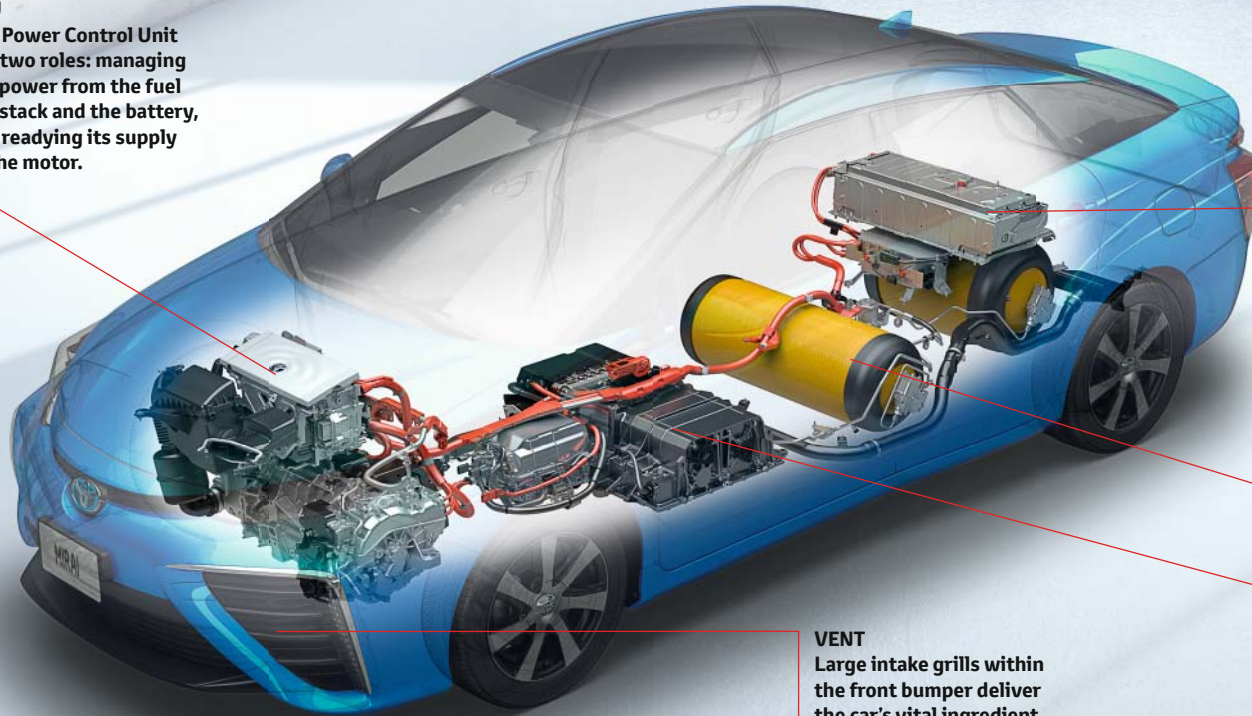
Four adults are able to relax in a quiet interior offering wide heated seats and a high-tech cabin with flowing curves, rich carbon details and a practical boot space. A wireless phone charger tray, and a 4.2" air control display with electrostatic switches – that let you adjust the cabin's temperature at the slide or touch of a finger – finish off an unmistakably high-tech interior.

A FUTURE WITH HYDROGEN MADE POSSIBLE BY HYBRID

With decades of hybrid technology expertise behind us, we've built the perfect platform with which to develop proprietary technologies, such as the fuel cell stack. We know we can't start an alternative fuel revolution on our own though, so we've made over 5,000 fuel cell patents available for other carmakers and industries to use, royalty-free.

PCU

The Power Control Unit has two roles: managing the power from the fuel cell stack and the battery, and readying its supply to the motor.



BATTERY

The Mirai's nickel-metal hydride battery stores the energy that is recovered while decelerating, and also assists the fuel cell stack when you need more power during acceleration.

TANKS

Two high-pressure carbon fibre tanks store the hydrogen as fuel. These lightweight tanks feature a world-leading power density and are capable of withstanding incredibly high forces.

VENT

Large intake grills within the front bumper deliver the car's vital ingredient, air, to the Mirai's fuel cell stack.

FC STACK

The Toyota fuel cell stack features a compact size and a world-leading power output for responsive performance.

SPECIFICATIONS

ELECTRIC MOTOR

Maximum power output (DIN hp)	154
Maximum power output (kW)	113
Maximum torque (Nm)	335

PERFORMANCE

Maximum speed (km/h)	178
0–100 km/h (secs)	9.6
Cruising range (km)*	550 (approx.)
Drag coefficient	0.29

HYBRID BATTERY

Number of cells	34
Capacity (Ah)	6.5

FUEL CELL STACK

Volume power density [§]	3.1 kW/l
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HIGH-PRESSURE HYDROGEN TANKS

Number of tanks	2
Fuel tank capacity (litres)	122.4 (front 60.0 / rear 62.4)
Nominal working pressure	70 MPa (700 bar)
Tank storage density [°]	5.7 wt %

SUSPENSION

Front	MacPherson strut
Rear	Torsion beam

BRAKES

Front	Ventilated disc
Rear	Solid disc

LOAD CAPACITY

Luggage capacity (litres)	361
Luggage room length (mm)	728
Luggage room maximum width (mm)	1612
Luggage room height (mm)	554

DIMENSIONS & WEIGHTS

Exterior length (mm)	4890
Exterior width (mm)	1815
Exterior height (mm)	1535
Front tread (mm)	1535
Rear tread (mm)	1545
Front overhang (mm)	1075
Rear overhang (mm)	1035
Wheelbase (mm)	2780
Ground clearance (mm)	130
Interior length (mm)	2040
Interior width (mm)	1465
Interior height (mm)	1185
Number of seats	4
Gross vehicle weight (kg)	2180
Kerb weight (kg)	1850

* Estimated, according to NEDC Cycle. As measured by Toyota when refuelling at a hydrogen station supplying hydrogen at a pressure of 70 MPa under SAE J2601 standards (ambient temperature: 20 °C; hydrogen tank pressure when fuelled: 10 MPa). Differing amounts of hydrogen will be supplied to the tank if refuelling is carried out at hydrogen stations with differing specifications, and the cruising range will therefore also differ accordingly. Possible cruising range may vary largely due to usage conditions (weather, traffic congestion, etc.) and driving methods (quick starts, air conditioning, etc.).

[§] As of November 2014, Toyota data.

[°] Hydrogen storage mass per tank weight.



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TOYOTA-EUROPE.COM/MIRAI

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THE ONLY TAILPIPE EMISSION FROM MIRAI IS WATER

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