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## Automobiles

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### GREENTECH

# Hydrogen Car Is Here, A Bit Ahead of Its Time



**TIME TRAVEL** Honda says its FCX Clarity fuel-cell car is production-ready...

By **NORMAN MAYERSOHN**

SANTA MONICA, Calif.  
**O**FTEN, it is the smallest of gestures that deliver the most powerful messages. I was reminded of this last month when I settled into the driver's seat of the FCX Clarity, a sedan powered by fuel cells that Honda will begin leasing to a handful of private customers next summer. Fresh from a briefing that detailed the car's NASA-grade complexity, I wondered what procedures might be required to start the reaction of hydrogen and oxygen and bring the power supply to life.

In fact, it took nothing more than inserting an entirely conventional metal key into a normal-looking switch and pushing a power button much like the one that starts the Honda S2000 sports car. The familiarity of the steps — deliberate gestures, I think, to convince drivers that the cars of our future aren't so frightening after all — reinforced the message of the meeting I had just left: the FCX Clarity is ready now.

Scanning the dashboard for unmarked switches, mysterious buttons and puzzling controls, I looked for the inevitable loose ends of an engineering prototype being hus-

bled toward production. Seeing nothing unfamiliar beyond a dazzling 3D dashboard display — a large power meter where my eye expected a tachometer, with a glowing ball in its center to track hydrogen consumption — I noted essentials like the parking brake and seat adjustment, all familiar operations. There really wasn't going to be much out of the ordinary about the way this car drove, at least.

That theme was repeated by another, less apparent gesture: no engineer or technician from Honda came along on my test drive, both a sign of confidence in the car's road-readiness and an indication of how normal it is.

Normalcy is a recurring, and intentional, theme of the FCX Clarity. It is refueled using a high-pressure connector tucked behind a typical gas-cap door on the rear fender. It has a handsome exterior, a nice audio system and plenty of knee room in the back. Anyone who has driven a Toyota Prius will feel at home with the dash-mounted gear selector and the park button.

Honda has not announced who will get the FCX Clarities or how many will be available in Southern California, where the program begins. Households will be select-

ed, in part, for their ready access to hydrogen stations. Honda is realistic about the slow growth of a hydrogen infrastructure as well as the viewpoint that fuel cells may not seem to make much sense using current methods of hydrogen production.

But there are practical matters to consider as well: compared with alternatives like plug-in hybrids, the onboard energy supply is quicker to replenish and has a better travel range, 270 miles. Moreover, in Honda's full-cycle calculation, a fuel-cell vehicle can reduce carbon dioxide output by half compared with a gasoline vehicle. In the United States, where much electricity is produced from coal, it is even better than a battery-electric car, Honda says.

It will be a while before drivers selected for the three-year, \$600-a-month Clarity lease program (it includes insurance and maintenance) will think about such topics. Instead, they will revel in its extraordinary silence. It drives away from a stop so quietly that it seems to be holding its breath, much as a hybrid does before the gas engine starts. Accelerating onto Interstate 10, though, incites a turbinelike zing — quite pleasant, really, if not as satisfying as the guttural bark of a V-8 — and

the Clarity blends effortlessly into traffic. The sound of a pump at work breaks the silence occasionally, but it has none of the clicking and whirring evident in the previous-generation FCX.

Honda says the performance is on par with a similar-size car powered by a 2.4-liter engine, and it should know, as the 2008 Accord LX has just such an engine. The comparison is apt. The FCX motor produces 134 horsepower and 189 pound-feet of torque; the Accord's in-line four makes 177 horsepower and 161 pound-feet. The Clarity weighs nearly 3,600 pounds, and while that is 400 pounds lighter than its predecessor, the Accord is some 300 pounds lighter yet. The wheelbases of the Clarity and Accord are identical at 110.2 inches.

On a drive up the Pacific Coast Highway to Malibu, the Clarity lacked nothing except engine noise, and it easily kept pace with traffic when I turned off and headed up into the canyons. It wouldn't be smart (or useful) to look for the edge when driving what is probably a million-dollar handbuilt car, but the FCX handled curves admirably and effortlessly. The electric power steering was a bit quick for my taste, but more than making up for that were the marvelous brakes showing none of the coarseness of the Prius's regenerative braking.

In fact, the degree of refinement was impressive throughout, from the polished look under the hood to the absence of rattles and squeaks one might excuse in a car that is still far from an assembly-line product. The FCX is no lab rat.

While the FCX seems fully qualified for local duties, its practicality for longer trips will have to wait on the availability of hydrogen. In this latest version, the range is a reasonable 270 miles on a single refill of the 5,000 p.s.i. tank behind the rear seat. Most fuel-cell vehicles using compressed hydrogen are now built around 10,000 p.s.i. tanks for greater range.

Honda chose to take a different route, emphasizing efficiency over capacity.

For instance, the 100-kilowatt fuel-cell stack is a Honda-built vertical-flow design, more powerful than the previous design, yet smaller — about the size of a carry-on suitcase — and lighter. The engineers reduced the load on the air-conditioning system by bringing climate control directly to the occupants, using fans in the seats to blow air cooled or warmed by thermoelectric elements.

Honda calculates its hydrogen consumption as the equivalent of 68 miles a gallon, all the more impressive considering the car's excellent performance and accommodations for four — and the fact that it is fitted with the same tires as an Accord V-6, rather than special high-mileage rubber.

Until now, writing about fuel cells has been a no-risk proposition, with no reality

**COOL CAR** Seats in the FCX Clarity include fans to heat and warm occupants, reducing the energy drain of the climate-control system. Concave interior surfaces add to a sense of spaciousness.



check looming, no looking back when the cars arrived in showrooms to see whether one had been embarrassingly optimistic. Way back in the 1990s, a physicist assured me that fuel-cell cars were 20 years away — and always would be.

Honda has a different timeline; it considers this version of the FCX a production car, ready to roll into showrooms from a manufacturing and operational standpoint. Issues like fuel supply — po-

tentially addressed by a grow-your-own solution called the Home Energy Station — remain unsolved, as does the matter of cost. The FCX Clarity still costs several orders of magnitude more than it will have to when true retail sales, without a Honda-subsidized lease, begin.

Maybe it's not yet time to call back the pessimistic physicist — it's my cousin Howard, actually — but the day is drawing closer.

## Design Notebook: Honda FCX Clarity

After breaking ground with the unabashedly futuristic Insight, Honda installed hybrid powertrains only in conventional models like the Civic and Accord. The FCX Clarity fuel-cell car signals a shift in Honda's design strategy.

The new direction takes some cues from the Toyota Prius, which is offered only as a hybrid. That car's separate nameplate and signature shape clearly identified its buyers as being environmentally conscious. The FCX Clarity takes a similar tack – trying to make the technology appealing, not invisible – and even its overall shape is reminiscent of the current Prius. Yet it is also a clever design in many of its details.

**A-PILLAR** The shape of the front roof support, which typically ends at the base of the windshield base, extends into the fender with a distinct bulge – think of a tree root poking through the ground – to suggest strength.

**DOOR WINDOW** Like many recent models, the FCX has a small fixed window at the forward end of the door. Rather than surround it with thick molding, designers used a thin frame for a better view.



**REAR OVERHANG** Because there is no gasoline engine under the hood, Honda designers were able to give the FCX a short nose. But a large hydrogen tank behind the seats dictated a relatively long area behind the rear wheels.

**COAXIAL MOTOR-GEARBOX** The basketball-size electric motor is positioned in-line with the gearbox. This compact powertrain lets designers maintain crush space despite the short nose.

**AERODYNAMIC WHEELS** Making the wheels of forged aluminum let designers keep the spokes narrow and the weight low. But airflow between the spokes caused turbulence, so plastic inserts were added to narrow the gaps.

**CHROME TRIM** The bright strip along the bottom of the side windows also wraps around the housing of the outside mirror, neatly tying together otherwise separate elements.

**EXTRA WINDOW** The car's rear glass gives little view of what's behind, so there is a window in the trunk lid, similar to the Civic CRX of the 1980s. A privacy film keeps items in the trunk out of sight.



**FRONT GRILLE** Why would a car with no engine need a grille at all? Well, there are actually three radiators behind this opening to serve the fuel cell, electric powertrain and air-conditioning.

**NO TAILPIPE** With no low-mounted exhaust system, the underside of the car is nearly flat, which lets air flow smoothly to minimize drag.

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