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FCX Clarity: Bring on the hydrogen stations

By James R Healey
USA TODAY

SANTA MONICA, Calif. — Wind-flicked waves slap the beach. Cloud-dulled sun warms the Pacific air to 69 degrees. Honda FCX Clarity fuel-cell car scampers along disturbing nothing but the air around it.

Hydrogen, not petroleum, fills its tank. Electricity, not internal combustion, slings it forward.

Only the notable whine from an air compressor disturbs the picture, changing pitch intrusively as the motor changes speed. Honda pledges to reduce that before putting Clarity sedans into users' hands in the Los Angeles area next summer. General Motors has done a better job quieting the compressor on its Chevrolet Equinox SUVs modified to run on fuel cells (Test Drive, Nov. 9).

That compressor whine and slightly skittish steering are the only things worth a general gripe about Clarity, the first regular-production fuel-cell car aimed at individuals. Previous FCX cars have been intended for fleet users. Only two are driven by individuals.

Honda plans to lease maybe 100 of the new cars for three years at $600 a month, including collision insurance and maintenance.

The automaker can't afford to have them become a hit just yet because it's losing a relative fortune on each one. Honda won't say, but figure at least $300,000 to build each one. Clarity is a ground-up design that could be mass-produced should the cost collapse and the number of hydrogen stations balloon. But even in lead-the-way California, only three stations are open to the public, Honda says.

Hydrogen fuel-cell cars are rare and new. How they work: A compressor pulls in air, which moves through fuel-cell membranes along with hydrogen from the car's tank. As the gasses pass through the membranes, they create an electrochemical reaction that generates electricity for the motor and water as exhaust. No petroleum use, no harmful emissions.

Examining Clarity strictly as a car, not as a harbinger of a hydrogen future, these are the impressions from a morning drive. The test car was an early-production version of the car that will be available next summer.

▸ **Power.** Sufficient, about even with a midsize sedan powered by a 2.4-liter gasoline engine.

Clarity is a tad sluggish off the line under full throttle, and it's no jet in upper speed ranges. But it's feisty, punchy in middle speeds where most people drive most of the time. Not a dog otherwise, just not as peppy as hoped.

▸ **Interior.** Premium. Looks and feels like a near-luxury car. Roomy front and back.

Honda used the vast forward reach of the dashboard to design the instrument panel and center stack of controls and features so they appear to float above the floor console, leaving room underneath for storage.

No leather, only Honda's bio-fabric, made from plants. Comfortable and carbon-correct, but it lacks the eye appeal and sensuality of dead cow.

Best gauge innovation: a dot in the center of the speedometer. The dot changes color and size to show whether you're hogging or saving energy. No distracting power-flow charts and energy-flow charts and graphs as in other alternative-power machines.

▸ **Changes.** Lithium-ion battery replaces so-called supercapacitor in the previous FCX. The battery mainly is recharged when coasting and braking.

Honda

FCX Clarity: The new Honda fuel-cell car has a blunter nose that the concept car had. Honda plans to lease up to 100 of the new cars for three years at $600 a month, including collision insurance and maintenance.

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Honda says lithium-ion batteries work well in fuel-cell cars because they are supplemental power sources and can be discharged and recharged within a narrow range. They aren't drained, then fully recharged, in the dramatic cycle that can cause overheating and has slowed their use in electric cars and hybrids.

Engine and transmission take up three-fourths the space they did in the previous FCX. A single hydrogen tank with one-fourth the parts replaces two smaller tanks. A single radiator cools drivetrain and fuel cell and acts as air conditioning condenser, taking 40% less space than three separate units.

▸ **Exterior.** Similar to the concept car, (Test Drive, May 18) but tailored for manufacturing and other realities, which means a blunter nose and revised rump.

▸ **Fueling.** Should be simple. Shove a hydrogen station hose onto the nozzle behind the fuel-filler flap.

And relatively cheap. Ben Knight, Honda's hydrogen fuel-cell expert, says some stations in California sell hydrogen for $5 a kilogram. A kg has the same energy as a gallon of gasoline, so it's like paying $5 a gallon. But you go two to three times as far on the hydrogen.

Reality check:

▸ You probably can't find hydrogen fuel unless you live in California, Washington, D.C., or New York state.

▸ The fuel cell itself is very expensive. Cost wouldn't immediately drop simply by boosting volume, car companies caution.

▸ Fuel-cell cars don't pollute, but making their hydrogen fuel does.

▸ Ninety-five percent of hydrogen is made from natural gas, and we don't have much. Energy Information Administration data show the USA has 3.3% of the world's natural gas. Russia, Iran and Qatar have biggest reserves, says EIA data derived from Oil & Gas Journal.

▸ As with other fuels, making hydrogen takes more energy than the hydrogen provides. GM, hustling to have a regular-production fuel-cell car in 2011, calculates that it takes: 1.73 British thermal units (Btu) of energy to produce 1 Btu of hydrogen energy using natural gas; 1.25 Btu to produce 1 Btu of gasoline energy, which powers a vehicle only one-third to one-half as far as hydrogen will.

Honda says founder Soichiro Honda liked to say that engineers are lucky: When they find a problem, they "have an opportunity to solve it."

Judged by that standard, says Masaru Hasegawa, the man in charge of the FCX Clarity, "I am very lucky."

By Makoto Inoue, Honda

Power gauge: Clarity's speedometer sports a dot that changes according to your energy use.

2008 Honda FCX Clarity

▸ **What is it?** Midsize, front-wheel-drive sedan powered by a hydrogen fuel cell. Developed from scratch as a fuel-cell vehicle meeting all government regulations and aimed at individual users instead of fleets. Manufactured in Japan.

▸ **How soon?** Available in limited numbers next summer in Southern California.

▸ **How many?** Up to 100, Honda says, but won't say if that's next year or over several years.

▸ **How much?** Three-year leases only, $600 a month including insurance and maintenance.

▸ **Who'll be driving?** Honda picks who gets the cars and says they'll probably be: 30 to 55 years old, with kids, average yearly income of $150,000, at least one other car; live near hydrogen stations; not have long commutes.

▸ **What's the drivetrain?** Electric motor rated 134 horsepower at about 3,500 rpm, 256 pounds-feet of torque instantly, run by electricity from a hydrogen fuel cell mounted in the center tunnel between driver and front passenger; 288-volt lithium-ion battery to help power some accessories and provide extra jolt for hard acceleration and for other times the fuel cell can't keep up. Single-speed transmission; traction control.

▸ **How zoomy?** Standstill to 60 mph in about 9 seconds, Honda says. Flat out, 100 mph.

▸ **What's the safety hardware?** Expected front, side and side-curtain air bags; stability control, anti-lock brakes. Cutoff circuit stops flow of hydrogen while filling if a leak is detected.

▸ **What's the rest?** Standard features include power steering, brakes, windows; automatic dual-zone climate control; heated and cooled seats (to minimize need for fuel-using climate control); AM/FM/CD stereo with USB plug for iPod; navigation system; adaptive cruise control.

▸ **How big?** Midsize, though designed to carry only four; 190.3 inches long, 72.7 inches wide, 57.8 inches tall on a 110.2-inch wheelbase. Weight is listed as 3,582 pounds, about 100 pounds lighter than previous, smaller FCX.

▸ **How thirsty?** Honda forecasts the equivalent of 58 miles a gallon in combined city-highway driving. Tank holds enough for 270 miles. Trip computer showed the test car got the equivalent of about 55 mpg, in a mix of suburban and highway driving.

▸ **Overall:** Too pleasing and promising to be patient. Blackmail, threaten, bully or bribe the hydrogen establishment for more public stations.