



KATSUMI KASHIMURA | ASSOCIATED PRESS

Yuji Kawaguchi, Honda Motor senior chief engineer, said trimming the fuel-cell stack to 106 pounds makes the car easier and cheaper to produce.

Honda introduces auto fuel cell that runs at freezing temperatures

By Yuri Kageyama
ASSOCIATED PRESS

TOKYO — Honda Motor Co.'s next-generation fuel cell for cars is cheaper, smaller and overcomes a major problem of past models — it can operate at freezing temperatures.

Fuel-cell cars are virtually pollution-free. They run on electricity produced when hydrogen stored in a tank combines with the oxygen in the air leaving water as byproduct.

The world's major automakers, including General Motors Corp. of the United States and Japan's Toyota Motor Corp., are working on fuel-cell vehicle development.

But fuel-cell cars have had

problems running at chilly temperatures because hydrogen fuel freezes.

By using metal parts not used in past fuel-cell stacks, Honda's new version runs at temperatures as cold as minus 4 degrees Fahrenheit, Honda said as it unveiled the cell yesterday.

It said the new metal helps because it heats up faster.

Honda simplified the design of the fuel-cell stack to require half the number of parts of Honda's 2001 model.

It also trimmed its weight to 106 pounds from 161 pounds. It will be easier and cheaper to produce and can be recycled, Honda said.

"We have come up with a

top-grade fuel-cell car," said Yuji Kawaguchi, Honda senior chief engineer.

"We expect to cut costs drastically."

Kawaguchi declined to give specifics on the expected cost cuts. But he said a car with the new fuel-cell stack will begin test runs soon in Japan and northeastern United States. The car will be ready for leasing soon but no plans have been finalized, Kawaguchi said.

The car, loaded with two of the new fuel-cell stacks, delivered a quiet ride that is as smooth as a regular gasoline-engine car in a test drive for reporters. It can go 245 miles on a full tank, up from 220 miles.

THE NEW YORK TIMES

FUEL CELL ADVANCE



The Honda Motor Company has developed a fuel cell for cars that can operate at freezing temperatures. Fuel-cell cars run on electricity produced when hydrogen stored in a tank combines with atmospheric oxygen, leaving water as a byproduct. The world's major automakers are working on developing

fuel-cell vehicles. But fuel-cell cars have had problems in the cold because hydrogen fuel freezes. Employing metal parts not previously used in previous fuel-cell stacks, Honda's new version runs at temperatures as cold as minus 4 degrees Fahrenheit, Honda said as it introduced the new cell yesterday. The new cell is also lighter and cheaper to produce, the company said. "We have come up with a top-grade fuel-cell car," said Yuji Kawaguchi, Honda senior chief engineer. "We expect to cut costs drastically."

(AP)

FCX with Honda FC Stack

Evaluation to be done in Japan and Northeastern U.S.

- **Start-up tests below 0 °C & public road driving in cold weather**



Work in progress...

NEW GENERATION



KATSUMI KASAHARA — Associated Press

HONDA'S FC STACK FCX, loaded with two of the next-generation fuel cell stacks, makes a test ride in a Japanese-style garden as the new fuel cells were unveiled Friday in Tokyo.

Honda unveils improved fuel cell

■ New model cheaper, can handle freezing temperatures

By Yuri Kageyama
ASSOCIATED PRESS

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Past fuel cell cars also required a wait before they could take off, but Honda's new version is ready to drive about 10 seconds after turning the ignition switch, a fifth of the old wait.

The widespread use of fuel cells may take decades because of high costs and the scarcity of hydrogen-fueling stations.

See **HONDA**, Business 6

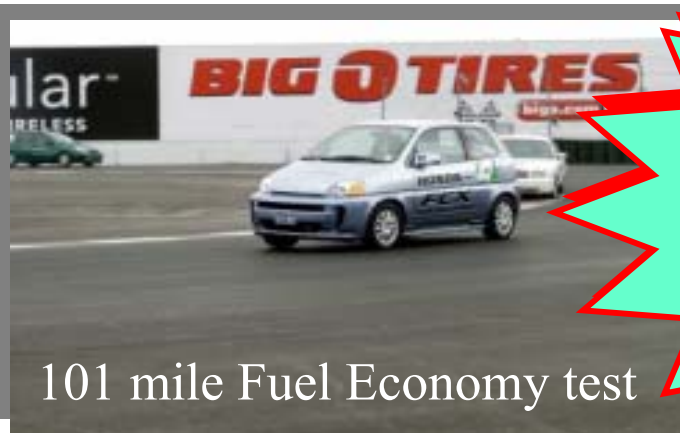
HONDA

Michelin Bibendum Challenge - 2003

FCX: Top Scoring Production Vehicle

FCX: 4 Gold,
1 Silver
(Top awards of any
production vehicle)

101 mile Fuel Economy test





HONDA

Fuel Cell Vehicle Scores at the Top



Award categories

No	Year / Model	Propulsion system	Participant	Acceleration	Braking	Slalom	Emissions	Efficiency	Noise	Local CO ₂ emissions
Category: small cars										
Production vehicles										
40	2003 Honda FCX	Electric (Fuel Cell)	American Honda Motor Co.	D	B	C	A	A	A	A
16	2003 Honda CIVIC GX	ICE-CNG	American Honda Motor Co.	C	B	B	A	B	B	A
52	2003 Honda Civic Hybrid CVT	ICE-G + Battery (Hybrid)	American Honda Motor Co.	C	C	B	A	B	B	A
33	2003 Toyota Prius	ICE-G + Battery (Hybrid)	Toyota Motor Sales, USA, Inc	C	C	B	A	B	B	A
32	2003 Honda Insight	ICE-G + Battery (Hybrid)	American Honda Motor Co.	C	B	C	A	B	B	C
	2004 Nissan		Nissan North							

CHALLENGE
BENEFIT U M



Arianna Huffington drives the Honda FCX



HONDA

PAPA JOHN'S



PAPA JOHN'S
Better Ingredients. Better Pizza.





HONDA

Special

CIVIC \$ 8



HONDA
FCX
FUEL CELL POWER



Fuel Cell Vehicle Salesperson:

DEALER

THE DEALER THAT
COULDN'T DESCRIBE
HIS COMPANY'S PRODUCT

IT INTEGRATES
THE RESOURCES...



www.dilbert.com scottcawthon@aol.com

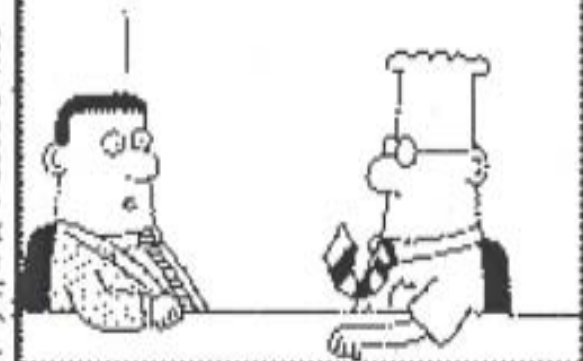
TO OPTIMIZE THE
PERFORMANCE OF
TECHNOLOGY.

YEAH, BUT
WHAT
IS IT?



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HEY, IF YOU DON'T
WANT YOUR RESOURCES
TO BE INTEGRATED,
JUST SAY SO.



San Francisco Honda – First Dealer Delivery of a FCV



**Mike Doerner, San Francisco Honda AFV Sales Manager, delivers
Honda FCX keys to Jared Blumenfeld, City of San Francisco**

H₂ Infrastructure Evolution

Current Phase

Initial fleet placements:
base station (central
refueling) supports early
customer use

Fleet Customer
H₂ Support

Sacramento
(CaFCP)



H₂

H₂ UC Davis

AC Transit

H₂

City of San Francisco

City of LA

H₂

H₂

H₂

H₂

Sunline

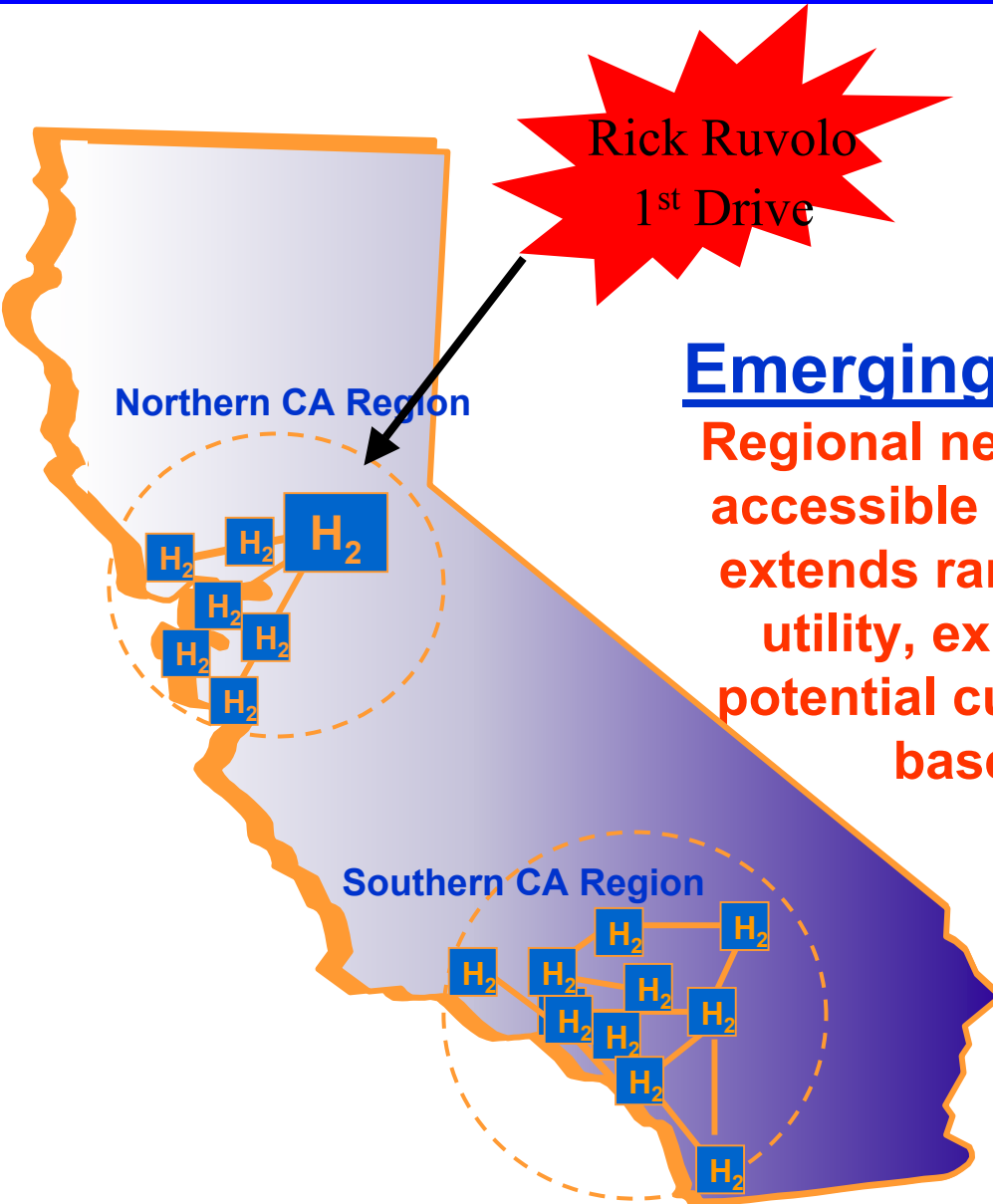
Torrance

H₂

UC Irvine

H₂

H₂ Infrastructure Evolution



Rick Ruvolo
1st Drive

Emerging Phase

Regional network of accessible stations extends range and utility, expands potential customer base

Fleet Customer
H₂ Support

Regional Network
of H₂ Stations

H₂ Infrastructure Evolution

H₂ Highway Vision



Future Phase

Link regions as demand & utility is demonstrated

Fleet Customer
H₂ Support

Regional Network
of H₂ Stations

H₂ Highway
Links

135+ miles Torrance to Rancho Mirage or San Diego Nonstop, >30 miles of fuel remaining !

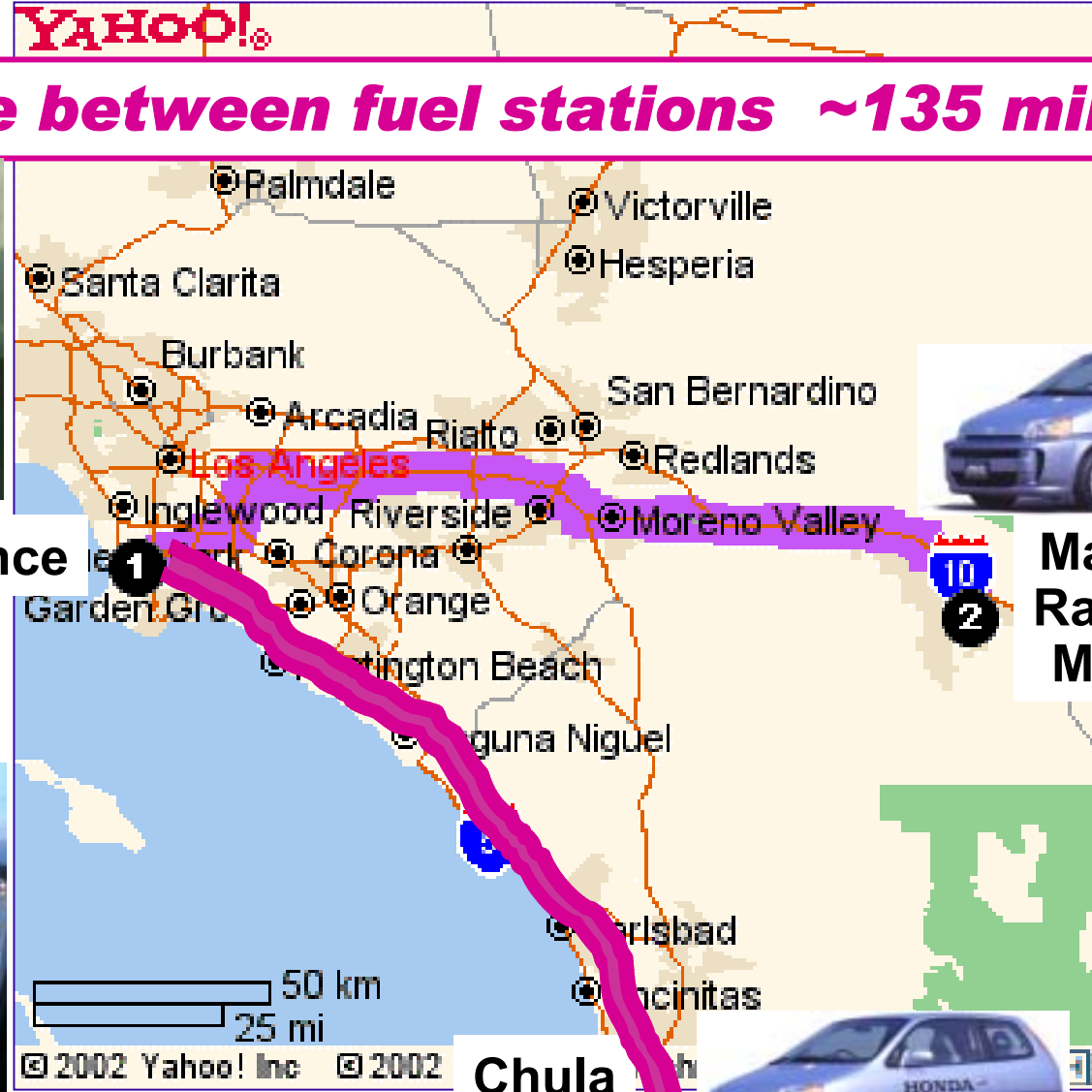
YAHOO!®

Distance between fuel stations ~135 miles



1 → 2

1 → 3



Marriott
Rancho
Mirage

Chula
Vista



HONDA

Hydrogen Fuel Solutions

(Air Products & Chemicals inc.)



HONDA

Honda's Torrance CA Stations (R&D)

Honda Solar - Electrolysis Hydrogen Station



In operation from 2001

Both stations provide 5000 psi fast fills for our local fleet vehicles

In operation from 2003



Honda & Plug Power Home Energy Station (HES)

HONDA



HONDA

HONDA

FCX

Something new for widespread FCV use

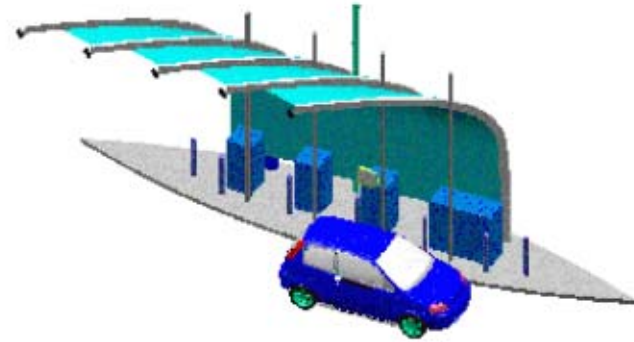


Complete Vehicle:

- Durability
- Environmental Adaptability
- Driving range
- Cost

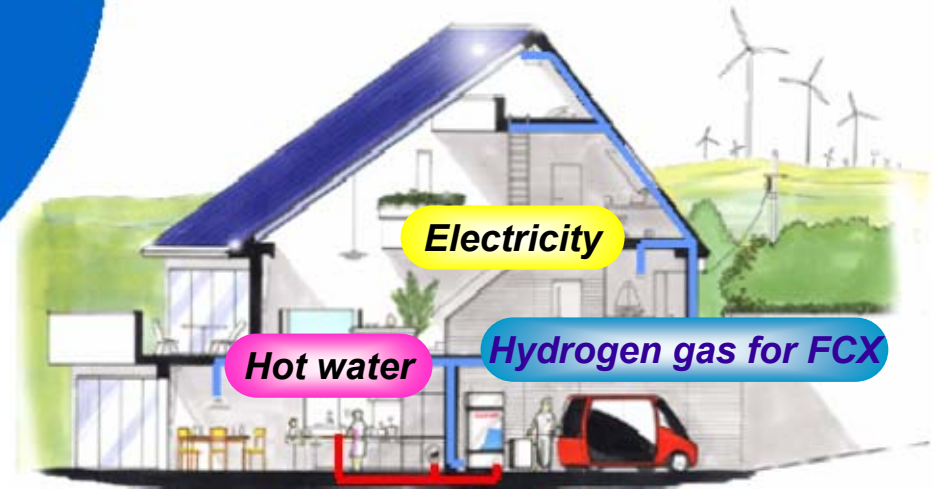
Attractive Commercial Characteristics:

- Drivability & Response
- Silent
- Clean
- Spacious
- Etc.



- Construction of fuel infrastructure
 - Establish legislation and standards
- +

New value from Fuel Cell





4386

JVC



HONDA



HONDA

The power of dreams.™

HONDA

The power of dreams.™