

## As energy bills soar, Japanese test fuel of future



This file picture dated April 2008 shows Japan's electronics giant Matsushita Electric Industrial's the new fuel cell cogeneration system for home use in Tokyo. As world oil prices skyrocket, thousands of households in energy-poor Japan are taking part in an ambitious experiment to use fuel cells to light and heat their homes.

**As world oil prices skyrocket, thousands of households in energy-poor Japan are taking part in an ambitious experiment to use fuel cells to light and heat their homes.**

Since the prime minister's official residence became the first house in the world to be equipped with a domestic fuel cell in 2005, about 3,000 households have signed up to have the grey boxes installed outside their homes.

The project aims to thrust Japan to the forefront of a "hydrogen society" that has kicked its addiction to fossil fuels and produces affordable energy while spewing out far less of the greenhouse gas that is blamed for global warming.

"The principle of fuel cells has been known since the end of the 14th century, but their first practical use was not until 1965, aboard the American spacecraft Gemini 5," said Michihiro Mohri, a senior vice president at Nippon Oil Corp.

The fuel cells produce electricity and hot water through a chemical reaction between oxygen and hydrogen extracted from natural gas or other fuels.

"The hydrogen needed can come from various sources -- hydrocarbons, natural gas, bio mass or rubbish" to create methane, said Mohri.

While the fuel cells do not emit carbon dioxide, some is produced by the system during the process to extract hydrogen from natural gas, although less than traditional forms of power generation.

As well as producing electricity, the fuel cells also ensure a steady supply of hot water for households. With no motor inside, the machines -- about the size of a small cupboard -- are also silent.

"Households with the system are also no longer at the mercy of power cuts during natural disasters," said Mohri, an obvious plus for people living in one of the most earthquake-prone countries in the world.

Japan, with almost no natural energy resources of its own, is seeking to reduce its dependence on crude oil imports by developing energy efficient appliances and alternative forms of power generation.

Oil prices posted their biggest ever one-day gain on Friday, hitting a new record of 138.54 dollars a barrel in New York, up five-fold since 2003 amid supply worries and rising demand in emerging economies.

Far behind in meeting its obligations under the Kyoto Protocol to cutting emissions, Japan hopes to drastically reduce the amount of carbon dioxide produced by its households.

The government even recently called on households to cut their time in the bath or shower to help meet Kyoto targets.

The government-sponsored fuel cell scheme involves a clutch of Japanese energy and technology heavyweights including Nippon Oil, Tokyo Gas, Sanyo Electric, Toshiba, Matsushita Electric Industrial, Mitsubishi Heavy Industries and Toyota Motor.

Some provide the source of hydrogen, others batteries or other components.

The government estimates there could be demand for 550,000 domestic fuel cells a year in Japan within a few years. There are 48 million households in Japan, of which 25 million live in individual houses.

For now, however, the system is expensive at about two million yen, or some 19,000 dollars, excluding installation. Research is underway to make the machines as economical as possible thanks to less expensive sources of hydrogen.

Thanks to reductions in the cost of components, the companies involved in the project hope to reduce the price of the equipment to one million yen as soon as possible to boost demand, and to cut it further to 500,000 yen in 2015.

Japanese automakers are also chasing the fuel cell dream, working to create a viable car which would produce power through a chemical reaction between hydrogen and oxygen and leaving water as the only by-product.

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