

Publication of Hydrogen Supply Experiment in Joint Ditch

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1. Background

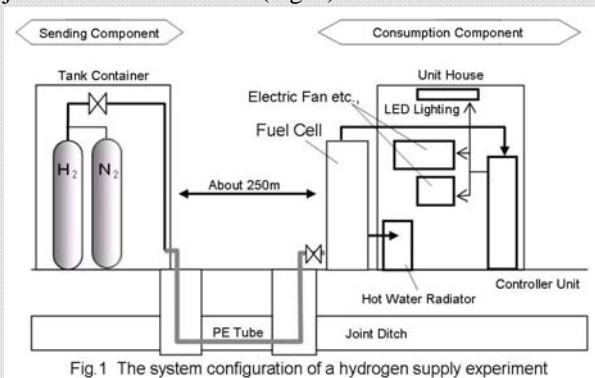
Hydrogen is the promising energy medium which replaces fossil fuel. A fuel cell which is driven directly by hydrogen gas does not discharge CO₂, and because both electricity and heat are utilizable, it is said that synthetic efficiency exceeds 80%.

The National Institute for Land and Infrastructure Management is conducting the technical development for supply and use of hydrogen as a new energy medium in the research project, "Development of the urban system technology towards low carbon and practical use of hydrogen energy in society (2009~2012)."

As part of these efforts, the open experiment which supplies hydrogen using a joint ditch which is the city infrastructure of Tsukuba, and drives a polymer electrolyte fuel cell (PEFC).

2. Outline of Open Experiment

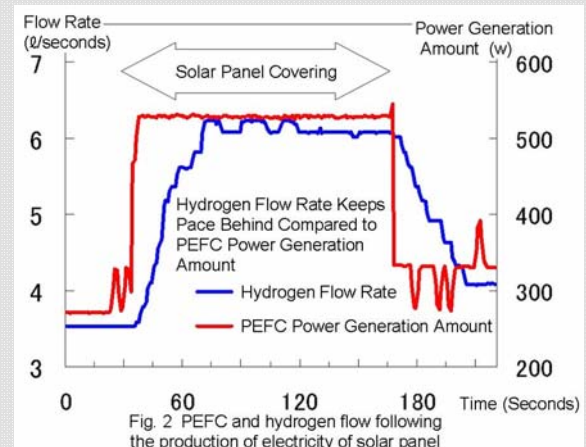
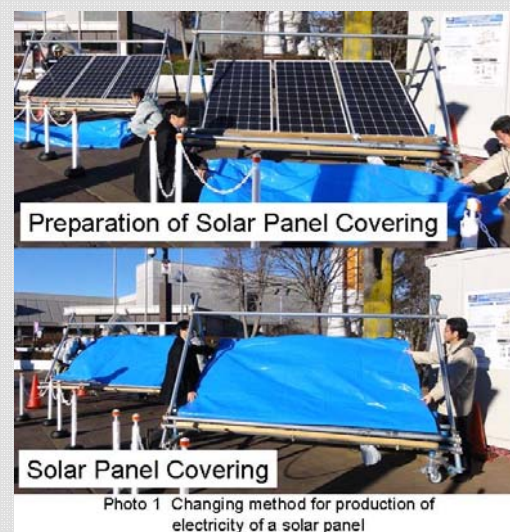
The experiment uses a prepared tank container the supposed gas utilities and a unit house which imitated a near future residence connected in two places with the joint ditches of Tsukuba. (Fig. 1)



For the purpose of using the device in regards to a hydrogen experiment, in addition to a gas-leak alarm machine, the gas leak detecting device by acoustic velocity and constant monitoring of flow rate of the gas, and also the emergency exhaust system were equipped in case of emergency.

At the unit house, imitating a near future residence, the electric supply from an electric power company in addition to a fuel cell, photovoltaic supply, and a storage

battery were equipped, and a operational experiment for each combination was carried out. (Photo 1)(Fig.2)



PEFC has characteristics similar to a battery and the electricity production changes according to electric power load.

Moreover, it is also possible to change the production of electricity according to change in the photovoltaic electricity production.

In addition, while installing the exhibition panel around the Unit House, the experiment was opened to the public and more than 100 people participated. Among them were administrators and researchers having inspection tours of the hydrogen piping inside the joint ditch.