

Plant Producing Hydrogen from Wasted Wood Has Been Completed

Arranged by T. HOMMA

1.National Policies

On September 20, 2011 the above ministry announced budget draft for 2012. Total requested budget of general account and specific account for energy is 1.762 trillion yen. The energy specific account is increased by 11.1 % compared with initial budget for 2011 fiscal year and it is 817.4 billion yen. In relation with resources and energy 51 billion yen is in the draft for early recovery of the disasters such as accidents of Fukushima plants and improved safety measures of conventional nuclear power plants. Considering disasters, the budget is mainly allocated for spread, technology development and resources exploration of renewable energy and energy saving. In a series of advanced technology development, for demonstration of high efficiency power generation, i.e., combined coal gasification, FC and separation and recovery of CO₂, 1.4 billion yen is included in the draft. In relation with town gas, introduction of gas co-generation system is supported. Support of introduction of Enefarm is also in the draft. For subsidy of Enefarm 9.6 billion yen is estimated and it is 900million yen increase. [The Denki Shimbun (electricity) , Sept. 30, 2011]

The above ministry was going to reopen subsidy for Enefarm introduction since Oct. 3, 2011. The initial budget was 8.6 billion yen and it was exhausted on June 7, 2011. The ministry collected 3.9 billion yen from other items to cope with subsidy increase. The selling price being decreased, the upper limit of subsidy is decreased by 50,000 yen, but those who applied on the day when the budget was exhausted will get subsidy of 1.05 million yen. The ministry requested the similar amount budget in the complimentary budget for 2011 fiscal year. [The Nihon Keizai Shimbun Oct. 1, 2011 and The Nikkei Sangyo

Shimbun(economy and industry) Oct. 4, 2011]

The ministry announced on Oct. 21, 2011 budget items requested in relation with the ministry in the third complimentary budget for 2011 fiscal year, and the draft will be presented to the diet in the present meeting. The requested budget is 1.6526 trillion yen including requested by other ministries and agencies. The ministry announced energy related items, and they are (1) measure for electric power demand, (2) obtaining natural gas for stable electric power supply, and (3) fuel supply system enduring disaster. For measure of demand and supply electric power saving and ecological subsidy will be newly created (200 billion yen). The items of this measure are solar photo-electric generation for residences (119 billion yen, energy management system (30 billion yen), batteries (21 billion yen), FC (5billion yen), gas air conditioning (5 billion yen) and modification and maintenance for electric power saving (15 billion yen). [The Denki Shimbun (electricity) and The Kensetsu Tsushin Shimbun (construction) Oct. 24, 2011]

(2) NEDO

Considering that FCV spread to general users starts about 2015, NEDO will investigate possibility of hydrogen supplying infrastructure, and its operating organizations are selected as follows; Yamaguchi Prefecture, Yamaguchi University, Chugoku District General Research Center (Hiroshima city) (???), and Universal Energy Research Institute (???) (Tokyo prefecture). Areas where advanced construction is anticipated are four, i.e., Capital area, Chukyo, Kansai and Fukuoka, and the investigation will be done for area following the above areas. Number of FCV, demand for hydrogen and their necessary site numbers are estimated. Supply ways and anticipated price will be examined and tasks will be

shown. The scale of the budget is less than 5 million yen. [The Kensetsu Tsushin Shimbun (construction) Oct. 14, 2011]

2.Policies by Local Governments

(1) Osaka City

For promotion of smart houses to improve energy self-sufficiency and efficient energy use, division of construction and maintenance of Osaka City office will sell city owned lands at Yokotsutsumi in Tsurumi ward for citizens applied with good proposals to well use the lands. The division is soliciting proposal of designs and construction of detached houses for models of urban eco-house. The maximum ratio of area occupied by the house to total land area should be 80 %. The volume ratio should be 200 %. Under the conditions of small site and close distance to the next houses and, also, introduction of solar photo-generation, FC and batteries, they are looking for maximum effects in energy saving and creation. Models for advanced urban eco-houses are required. [The Mainichi Shimbun, The Nikkan Kensetsu Sangyo Shinbun (construction) Sept. 27, 2011]

(2) Sakai City

In "Harumidai Eco-model Town Creation" is now planed by the City. The site is a ruined primary school. The city announced that Daiwa House Industry Corp. (???) was selected as representative company and it got priority negotiation. In the proposal batteries, solar photo-generation and FC are introduced into all house, while EV car sharing is also introduced. [The Sankei Shimbun, The Nikkan Kogyo Shinbum (business and technology) Oct. 10, 2011 and The Nikkan Kensetsu Sangyo Shinbun Oct. 12, 2011]

3.Development of FC Elementary Technologies

(1) Business and Related Research of PAFC

In collaboration with Fuji Electric System Corp. Tokyo Gas Co., Ltd. developed system for recovery and reuse of CO₂ from PAFC. The method of recovery is based on a point that specific channels are made to separate only CO₂ from reformed gas by pressure control with a mixed gas separator. By conventional PAFC CO₂ exhausted at the rate of 1230 kg per day. By the experiment 800 kg can be

recovered from the above amount of CO₂. In conventional FC air is mixed so that the air concentration is low and hard to recover. Recovered CO₂ is cooled to very low temperature to make dry ice. [The Nikkei Sangyo Shimbun Oct. 14, 2011]

4.Technology Development and Business of SOFC

(1) JX Energy

On Oct. 3, 2011 JX Nikko Nisseki Energy announced that it is going to make demonstration of combined home use SOFC and EV in collaboration of Nissan Motor Corp. The EV used is "Leav" by Nissan with an electric supplier to home. It is used as batteries charged during low load for SOFC, when it is parking and thus operational factor should be increased. The demonstration is going to start in 2012 fiscal year at an experimental house "ENEOS Energy Creation House," of JX Energy. In the demonstration a lateral two-way inverter is used, and home use SOFC is charged EV during night of low power needs, while in day time power is supplied from EV to the house. Nissan is developing home use EV for V2H and it is going to presented to the demonstration. [The Denki Shimbun (electricity) Oct.4, 2011, The Nikkan Jidosha Shimbun Oct. 6, 2011, The Chemical Daily Oct. 11, 2011 and TheNikan Kogyo Shimbun (business and techniky) Oct. 13, 2011]

(2) Oosaki Coalgen Plan

Chugoku Electric Power Co., Ltd. and Power Source Development Co., Ltd. are now carrying Oosaki Coalgen Plan with support by Agency of Natural Resource and Energy. Since 2012 fiscal year, construction of demonstration of IGCC of 170 MW scale will be started as the first stage in Oosaki Power Plant (Hiroshima prefecture) of Chugoku Electric Power Plant. In the second stage (CCS), recovery and storage of CO₂ will be combined with IGCC. In CCS water steam is added to CO produced in IGCC, and they are converted t CO₂ and hydrogen by shift reaction. CO₂ is recovered. In the third stage SOFC will be attached to the system to use hydrogen from IGCC and CCS for power generation in order to make triple combined cycle (IGFC) aiming at zero emission. This is a large scale project and the

total cost is over 100 billion yen. Agency of Natural Resources and Energy gets 1.37 billion yen in budget draft and will support 1/3 of the cost. The demonstration is planned to start in 2018 fiscal year. [The Chemical Daily Oct. 14, 2011]

5. Business of Enefarm and Eco-Houses

(1) Hisoshima Gas Co., Ltd. and Panahome (???)

These two companies opened model houses in which “ECO Mane System” is installed to show energy consumption etc. Together with consumption of gas and electric power, power generation by Enefarm and Solar photo-generation are displayed in real time. The companies are anticipating this would be accepted energy saving-conscious homes. [The Denki Shimbun (electricity) Sept. 28, 2011]

(2) JX Energy

JX Nikko Nisseki Energy starts exploration of overseas market of home use FC. Assuming to be done in 2013 it is planning to export them to Korean market, and it begins demonstration test with Korean Gas Public Corp. to get licenses of safety, and assembling final products. The company has plan of reducing home use FC price from 2.7 million yen at present to 500,000 yen in 2015 fiscal year. [The Nihon Keizai Shimbun Oct.3, 2011 and The Chemical Daily Oct. 14, 2011]

On Oct. 18, 2011 JX Nikko Nisseki energy set forth that it starts sale of SOFC type Enefarm and it was installed in a ecology conscious house “Green First” In Hikari city of Yamaguchi prefecture. On Oct. 17, 2011 it was installed, and comparing PEFC the volume was by about 40 % reduced, and the electric generation efficiency is increased by 7 – 10 % to 45 % (LHV) which is advantage over PEFC for general home of higher power demand. JX Energy (???) itself has a plan to supply system combined with batteries and solar photo-generation. [The Denki Shimbun (electricity), The Nikkan Kogyo Shimbun (business and technology) and The Chemical Daily Oct. 19, 2011]

(3) DOL, Kishimura Industry and Nissan Motor Corp.

In cooperation, Design Office Line (DOL) (Tokyo prefecture), Kishimura Industry (Yokohama city) and Nissan Motor Corp. have developed houses of

energy saving type using batteries of EV “Leave” (???) by Nissan Motor Corp. Solar panels of output 2 – 5 kW on the roof is connected with EV parking at the lot to charge the batteries of 2 kWh. Enefarm of 700 W output by JX Nikko Nisseki Energy is also installed. Thus 3 – 10 kW of power can be obtained without any external power supply. [The Nikkei Sangyo Shimbun (economy and industry) Oct. 4, 2011]

(4) Pana Home

Oct. 5, 2011 Panahome announced sale of houses “CASART TERRA” which are net zero CO₂ emission houses and it was going to be sold since Oct. 6, 2011. Making use of underground heat, the houses are thermally insulators like thermos. Combing Eco-navi installed ventilation system, solar photo-generation system and Eco-Quto (???) and Enefarm, CO₂ zero emission is realized and expenses for heat and light are reduced to large extent. The price is about 690,000 – 710,000 yen/m² and it is planned that 2,000 houses would be sold. [The Nihon Keizai Shimbun, The Denki Shimbun (electricity), The Nikkei Sangyo Shimbun (economy and industry), The Nikkan Kogyo Shimbun (business and technology), The Dempa Shimbun (radio wave) Oct.6, 2011, The Jutaku Shimpo Oct. 11, 2011. The Dentsuho Oct. 17, 2011 and The Sankei Shimbun Oct. 22, 2011]

(5) Sekiwa Fudosan and Tokyo Building

Sekiwa Fudosan and Tokyo Building, both are in Sekisui House group, begin sales of detached houses with solar photo-generation system and Enefarm as standard installation and they sell them in Kanagawa prefecture. The first period of sales will begin in the end of November. [The Nikkei Sangyo Shimbun (economy and industry) Oct. 17, 2011 and The Jutaku Shimpo Oct. 18, 2011]

(6) Panasonic Corp.

Panasonic revised forecast of Enefarm sales from 5,000 sets to 6,000 sets. The sales were steeply going up due to the electric power crisis. Although subsidy was ended in July, it restarted in October. Depending on subsidy policy, 10,000 sets would be possible. [The Nikkan Kogyo Shimbun (business and technology) Oct. 18, 2011]

6. Forefront of Next Generation Eco-cars

(1) Toyota Motor Corp.

Toyota Motor Corp. changed PHV sales start from February to January. In accordance with this, chargers will be put at dealers. In representatives meeting it was announced. Making full use of about 5,500 dealers, convenience would be improved of PHV in long distance run. [The Nihon Keizai Shimbun Sept. 29, 2011]

(2) Osaka Sangyo University

On September 30, 2011 the university set forth that they got license for public road running of hydrogen FCV assembled by students. Assembling is done by total about 50 students and it started in 2002. The licensed car is the fourth one and a 2 passenger open car. It is the first licensee except major motors companies. Prof. Yamada and students in the Engineering Faculty did it. The length of the body is 3.8 m and gradual tear drop shape. It is said that the maximum speed is 80 km/h and it can run 200 km by one charge of several minutes. [The Yomiuri Shimbun, The Mainichi Shimbun, The Nihon Keizai Shimbun, The Sankei Shimbun Oct. 1, 2011, The Nikkan Kogyo Shimbun (business and technology) Oct. 3, 2011, The Nikkan Jidosha Shimbun (automobile) Oct. 5, 2011, and The Nikkei Sangyo Shimbun (economy and industry) Oct. 17, 2011]

(3) Nissan Motor Corp.

On Oct. 13, 2011 Nissan Motor Corp. announced that it developed charging system of non-contact type for EV. When EV parks over the system, the charging is done automatically. They expect real use within several years. FC was also developed for FCV. Comparing with the conventional one, the volume became half and used platinum amount and varieties of parts are 1/4. The cost in mass production stage is less than 1/6. The output, the volume and the weight of the new model are respectively 85 kW, 34 L and 40 kg. [The Mainichi Shimbun, The Nihon Keizai Shimbun, The Nikkei Sangyo Shimbun (economy and industry), The Nikkan Kogyo Shimbun (business and technology) Oct. 3, 2011, The Nikkan Jidosha Shimbun (automobile) and The Shizuoka Shimbun Oct. 14, 2011]

(4) French Air Liquid

The largest industrial gas company, French Air Liquid, starts research and development for FC in Japan. Till now research was done mainly in Europe, but it concludes that hydrogen gas research is necessary in Japan, where it is expected from automobile makers. Research group will be organized. [The Nikkan Kogyo Shimbun (Business and technology) Oct. 14, 2011]

(5) Toyota Motor Corp., Tokyo Institute of Technology and High Energy Acceleration Research Organization

The above three made next generation batteries using new compound in trial. When it is installed in EV, large current necessary for acceleration can be supplied. It is "all solid batteries" without inflammable liquid and materials for preventing inflammability are unnecessary, and thus the structure becomes simple and the cost can be reduced. It is easy to form sheet. The electric capacity per volume is several times larger, and continuous running distance increases from present about 200 km to 1000 km. It is anticipated that it would be realized in 2015 – 2020 after further improvement. [The Nihon Keizai Shimbun Oct. 17, 2011]

7. Use of FC to Ecological Equipments

"AQSOA desiccant air conditioner," developed by Mitsubishi Resin Co., Ltd. (???) is accepted in ecological energy innovation building under construction in Tokyo Institute of Technology. Zeolite is used for absorbing water vapor. Exhausted heat from FC (about 50°C) is used in air conditioners, and it is a characteristic point that absorbed water vapor can be released at low temperature. This point is highly appreciated from view point of energy saving. Making full use of its strongholds in Tokyo, Osaka and Nagoya, sales and maintenance will be done. [The Nikkan Kogyo Shimbun (business and technology), The Nikkan Kensetsu Shimbun (construction) and The Chemical Daily Sept. 27, 2011]

8. Business and Technology for Hydrogen Production and Purification

"Index Eco-Energy," a 100 % subsidized company of Shin-Idemitsu (ppp) (Fukuoka city) has

completed hydrogen producing plant using bio-mass, which is ordered to Hitachi Ship Building Co., Ltd. The ceremony of completion was held on Oct. 17, 2011. It is a commercial plant producing hydrogen from wasted woods in construction sites, and since November the trial operation will be started. Full operation is expected in April of 2012. The plant is a tower type of 36 m height and the area is about 9,000 m². Waste woods chips in construction and from thinned forestry are gathered from Kumamoto, Saga and Fukuoka. The woods are thermally decomposed and gasified, and hydrogen producing plant is sited to the next. From woods of 15 ton highly pure hydrogen of 7,200 m³ is produced per day. [The Nishinihon Shimbun Oct. 18, 2011, The Denki Shimbun , The Chemical Daily Oct. 21, 2011, The Nikken Kensetsu Sangyo Shimbun and The Nikkan Kogyo Shimbun Oct. 24, 2011]

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