Power-saving measures increase the demand for installation of ENE-FARM

Arranged by T. HONMA

1. National measures

(1) Ministry of Economy, Trade and Industry

The next-generation energy and social system promotion council of Ministry of Economy, Trade and Industry integrated intermediately the current status and the future direction of the smart community including the smart grid and the directionality in the future on June 23 and clarified the contents of the demonstration project in four domestic regions that would start in a full scale. By the fact that the necessity of the decentralized energy system after the East Japan Great Earthquake has been pointed out strongly, the project was held sooner and the directionality that construction of the smart community for the restoration of the disaster area was possible was shown. Concretely it means to evolve the technology in the past micro grid demonstration etc. further, and control cleverly the individual equipment such as the heat pump, FC, and storage batteries while taking the demand restraint and creation to customers through the economical incentive and construct HEMS, BEMS, FEMS, and the transportation system. (Architectures, Constructions & Engineering News, the Chemical Daily, June 24, 2011)

(2) Liberal-Democratic Party

The growth reproduction strategy idea which the first subcommittee of the National Strategy Headquarters of the Liberal-Democratic Party integrated was clarified on June 30. The idea described clearly the necessity of the thorough reexamination of the energy policy including nuclear power as the conversion for the growth and reproduction and came up with existing N-plant nuclear power plant activity maintenance and LNG reinforcement, etc. were on the assumption of the execution of the safely reinforced plan until, the enough electric power generation is secured by the renewable energy positioned as the pillar of new energy. The idea also pointed out to put staff and funds into the storage battery and FC field, etc. intensively, and placing the agriculture as the powerful growth industry, proposed to bring "positive attitude" like the abolition of the production adjustment to the fore. (The Nikkei, July 1,'11)

(3) Ministry of the Environment

On July 4 the Ministry of the Environment adopted "Businesses of the technology development for controlling global warming etc." in the fiscal year 2011 that consigned or executed by assistance the experimental study of the CO_2 emission control technology etc. of the energy origin which led to coexisting environment and economy. The business scale is about 2,200,000,000 yen in total and the period is three years at most. In FC-related is included the system demonstration that combined FCV and the small solar hydrogen station that Honda works with Saitama Prefecture, Iwatani International Corporation, and Honda Technology Research. (Nikkan Jidosha Shimbun, the Chemical Daily, July 5, '11)

2. Measures by local government

(1) Yamanashi Prefectural Government

Yamanashi Prefectural Government invited engineers who were familiar with the structure etc. of FC to decide to appoint them as advisers for raising FC related industries. The technical sales consultation intended for part suppliers in the prefecture is held, and advisers are asked to give necessary advices in case the product of one's own company is utilized in FC. About six staff are scheduled to be elected as advisers from the engineers who had the experience to be involved in the development manufacturing of the products which uses FC. (T The Yamanashi

Nichinichi Shimbun, June 24,'11)

(2) Tokyo Koto Ward

The Toyosu green Eco Island plan which Tokyo Koto Ward is examining has been set. The latest natural environment and the energy technology, etc. are introduced targeting about 110 ha in Toyosu wharf, and the environmental up-to-date base is formed. In the energy-related are introduced energy-saving technologies such as the storage battery and the heat storage system, FC and hydrogen technologies, and heat pump, and are used the reproducible and unused energies such as the sunshine, the solar heat, the wind force, the ocean heat difference, and the gas pressure difference, etc., starting over-all use such as the district heating and cooling, the point heat supply system, and the energy flexibility between buildings and the cogeneration system, etc.(Architectures, Constructions & Engineerings News (Daily), June 27,'11)

(3) Hyogo Prefectural Government

On June 27 Hyogo Prefecture Corporate Office sold in a lump 22,814m^2 partially of the reclaimed land "Shioashiya" in the bayside area in the Ashiya-city to Panahome. This company constructs state-of-the-art environment-friendly houses provided with the eco equipment such as heat pump water heaters and domestic FC besides the sunshine panel. (The Kobe Shimbun, June 28,'11, the Nikkan Kensetu-Kogyo Shimbun, June 29)

(4) Osaka Prefectural Government

For the joint statement by 13 companies such as Toyota, Nissan, Honda, and Osaka Gas that " we will market FCV centering on four large metropolitan areas (metropolitan area, Chukyo, Kansai, and Fukuoka) in 2015", Osaka Prefectural Government decided to establish the subsidy system targeting the enterprises in the prefecture which works on the hydrogen infrastructure technology development. The name is "subsidy for the development supporting project of the hydrogen infrastructure etc.", and the maximum of the subsidy is 8,000,000 yen. The application is available between July 11 and 26. (Nikkan Jidosha Shimbun, July 13,'11, the Nikkan Kogyo Shimbun July 14)

(5) Nagano Prefectural Government

Nagano Prefectural Government established the conference which aimed at diffusion of the next generation eco car such as EV. Japanese-style hotels, hotels, bus and taxi companies, and automakers, etc. participate in it. The maintenance of the social infrastructure is indispensable for the diffusion of EV. It appeals the advantage etc. of EV to citizens of the prefecture, and also advances the maintenance of the charge equipment aiming at diffusion. The setting of the numerical target is also examined about the quantity of diffusion and the installation location of charging equipment. The diffusion of PHV and FCV which can be charged with the domestic consent besides EV is promoted. (Nikkei Industrial News, July 20,'11)

3. Business development of PAFC

On July 19 Fuji Electric announced that they contributed PAFC"FP-100i" to the Tohoku Welfare University (Sendai-city) through the Miyagi Prefecture Disaster Countermeasure Headquarters as part of the disaster area support of the East Japan Great Earthquake. It is scheduled to begin the operation at the end of July, and supply electricity and heat to the nursing welfare facilities adjacent to this university. The city gas with medium pressure is used for the fuel of PAFC. It has high reliability as the supply did not stop even at the occurrence of the earthquake, and it is said to be suitable for the medical treatment nursing facilities where the stable power supply is necessary. The output is AC 100kW and the heat generated when electricity is generated is used by the hot-water apparatus of the facility. About PAFC made of this company it was installed at the Yamagata-city Purification Center in January-March of '11 and succeeded in the outdoor working demonstration in winter using sewage digestion gas. Also at the occurrence of the earthquake in March, power generation using digestion gas had been continued for two days until commercial electric power was restored. (The Nikkan Kogyo Shimbun July 20 '11, Nikkei Industrial News July 21)

4. Development and business development of SOFC

(1) Sumitomo Precision Products Co., Ltd.

Sumitomo Precision Products Co., Ltd. starts commercialization of SOFC for industrial use which is expected to grow as non-utility generator for the next generation by the end of current year and brings it up

to the leading business of the annual sales 10,000,000,000 yen. While the company has kept researching SOFC since 2001, it found a chance to develop using technology etc. of the existing industrial heat exchanger in addition to the demonstration data obtained by joint development with NTT etc. The company promotes the sales of the SOFC system of the output of power generation 5kW class to the enterprise consuming large quantity of electric power such as information and communication corporations by the end of the current year. Of course, there is the maximum problem of low cost in this product. Now the cost is about 3,000,000 yen/kW (output of power generation), which is about seven times that of the general gas engine dynamo, whereas the reformation of the mass production technology is hurried up, the yield rate improvement etc. are also necessary for achieving 400,000 yen/a kW in the fiscal year 2015. (Nikkei Industrial News, June 27,'11)

(2) Kyoto University

Prof. Shimakawa of Kyoto University and graduate student Matsumoto succeeded in controlling oxygen ion at 300℃ or less by using compound stratified, that is called artificial superlattice. It is expected to be useful for the expansion of SOFC usage by the use of this superlattice as the solid electrolyte. The calcium iron oxide and the titanic acid strontium were alternately accumulated by thickness of about 1nm by using the thin film growth technology of pulsed laser evapolation method to make the artificial superlattice. It was confirmed that heating this artificial superlattice and alkali hydroxide together at 200-300℃oxygen ion came out only from the layer of calcium iron oxide. (The Nikkan Kogyo Shimbun, the Kyoto Shimbun, July 1 '11)

(3) JFCC

Japan Fine Ceramics Center (JFCC) established the technology that evaluated quantitatively the point defect concentration in the solid electrolyte under the prescribed temperature and the atmosphere condition by applying first-principle calculation technology to the theory analysis of SOFC. The point defect is one of important points that rule the characteristic of the ceramic material including SOFC, and the contribution of SOFC to the generating capacity improvement can be expected by grasping this amount quantitatively. As the result of the technology development paying attention to zircon acid barium ($BaZrO_3$) which was the solid electrolyte of proton-conductive type the amount of the point defect which contributed to ionic conduction according to the condition when synthesizing changed greatly, and according to circumstances, it was clarified that the amount of the point defect decreased to even 1/10 or less of the optimum conditions. In synthesizing the electrolyte ceramics, it is shown that it is indispensable to control the producing condition accurately. (The Chemical Daily, July 7,'11)

(4) Hitachi Metals Co., Ltd.

On July 11 Hitachi Metals Co., Ltd. announced that they had developed the high performance material which improved the oxygen resistance, high temperature strength, and electroconductivity as interconnector material for SOFC. It had thermal expansion coefficient close to that of zirconia ceramics, and had improved various characteristics further against existing development material (ZMG232L) of ferrite stainless steel excellent in various characteristics at 700-850. Newly developed ZMG232J3 and 232G10 contribute to life improvement of SOFC due to excellent acid resistance at the operation temperature and contribute to maintenance for a long time of FC structure due to great high temperature strength. Also the voltage reduction in interconnector is reduced because contact resistance at the operation temperature is low, which contributes to the improvement of characteristics of power generation. In addition, G10 controls the evaporation of chrome by adding special element, and has the effect to decrease chrome evaporation which becomes the degradation factor of the cell. The company begins sample supply in July, and aims at increasing the sale to 500,000,000 yen in the fiscal year '15 and 5,000,000,000 yen in the fiscal year '20. (The Nikkei Business Daily, Japan Metal Daily, the Chemical Daily, July 12, '11)

5. Development of PEFC element technology

(1) Nagasa Co., Ltd.

Nagasa Co., Ltd. (Tokyo) developed the low-cost process of the metallic separator for PEFC. The number of process has been shortened by applying the processing method of the metallic thin board (diaphragm) used for various valves and parts of

pumps. Processing cost of the stainless steel material was suppressed to about 20 yen (processing of axis about 120mm) which was a few tenth in the existing rate with other companies. The processing time can be greatly shortened compared with the past. The flatness is improved further, and the technology development will advance to be processed even by a large size in the future. (The Nikkan Kogyo Shimbun ,June 27,'11)

(2) Nakayama Precision Co., Ltd.

Nakayama Precision Co., Ltd. (Osaka-city) starts metalworking at 10nm level of processing accuracy. The company newly establishes the factory for special use with the investment of about 1,000,000,000 yen in Kikuyo-machi Kumamoto Prefecture. The order of the stainless steel used for the separator for FC and the metal mold for manufacturing aspherical lens for the camera are expected. (The Nikkan Kogyo Shimbun, July 15,'11)

(3) Tanaka Precious Metals

Tanaka Precious Metals announced that the shipment of the catalyst for FC in the fiscal year 2010 recorded high. With the result in the fiscal year 2004 to be 100 the result in the fiscal year 2010 was 198, and only automotive was 162, which was the second best in the past. Diffusion of ENE-FARM and the research and development of FCV pushed up the shipment. (Steel Newspaper, the Chemical Industry Daily June 29 '11, Dempa Shimbun, Nikkan Jidosha Shimbun, June 30)

6. Business development of ENE-FARM

(1) ＦＣＡ

ENE-FARM is sold well. About 6,000 sets is sold during April-June, which exceeded the last year's result. They say that It is because people have concerned with "power generation in the home" due to the power shortage by the earthquake. As for JX Nippon Oil & Energy Corporation ENE-FARM is sold by 3.5 times the pace compared with the previous year, and as to Tokyo Gas Co., Ltd. 2,000 sets have been sold since April, and as to Osaka Gas Co. they were sold in April and May 1.5 times as many as compared with the same period of last year. The industry group want to sell it at about 3,000,000 yen and the government subsidizes 1,050,000 yen at maximum. There are only 8,000 budgets at the current year, and the budget is possibly lacking in September. (Asahi Shimbun July 7,'11, Chemical Daily July 12)

Fuel Cell Association (FCA) calls on to state that concerning introduction support subsidy of FC for consumer use in the fiscal year 2011 the application for the subsidy will stop at 17 o'clock of the day when the total amount applied for the subsidy exceeds the range of the budget even before the closing date (January 31,'12)(Dempa Shimbun, July 12,'11).

(2) Lemmon Gas Co., Ltd.

On July 19 major LPG company Lemmon Gas Co., Ltd. (Kanagawa Prefecture) announced that they would construct the electric heat supply type housing complex where LPG cogeneration had been set up. They intend to optimize the energy use, installing with used storage battery, ENE-FARM and photovoltaic generator at EV of Nissan Motor, at the same time appeal high degree of security due to speedy restoration of the disaster compared with city gas to intend to expand a similar concept house.

At first they aim to construct the showroom and apartment houses of 15 units (six floors on the ground and first floor in the underground) in Sagamihara-city to complete in March, 2012.

As for the concrete specifications besides installing two sets of gas-cogenerators 5kW (1 for reserve), the solar photovoltaic system 8.3kW and ENE-FARM the lithium-ion battery 24 kWh which was unable to be used in EV of Nissan Motor is provided without compensation. Also car sharing for citizens by 3 EVs "Leaf" is carried out. Sekisui House CO., constructs them at the total cost of about 500,000,000 yen. (The Denki Shimbun, the Nikkan Kogyo Shimbun, Architecture, construction and engineering News, July 20 '11, Nikkan Kensetsu Sangyo Shimbun, Nikkan Kensetsu Kogyo Shimbun, Nikkan Jidosha Shimbun, the Chemical Daily, July 21, the Nikkei Business, Daily, Jutaku-Shimpo, July 26)

(3) Shizuoka Gas Co., Ltd.

Shizuoka Gas Co., Ltd.constructs the low carbon house installed with the photovoltaic generation and ENE-FARM in Shizuoka-city.

This lot of land of the low carbon type is the second place following 22 units in Mishima-city and the company aims to expand such "Mishima type" eco-town at the new energy age. (The Shizuoka Shimbun, July 22,'11)

(4) Nihonkai Gas Co., Ltd.
Nihonkai Gas Co., Ltd (Toyama-city) deploys the campaign to set the purchasing price of 1 kilowatt-hour as 34 yen with adding 9 yen to the users of "Double power generation" where ENE-FARM and the photovoltaic generation are combined for houses that have strong movement to all-electric. (Kitanippon Shimbun, July 22,'11)

7. FCV & EV front
(1) Nissan Motor Co., Ltd.
On June 17 Nissan Motor Co., Ltd. clarified the policy to sell 1,500,000 EVs in total together with Renault until the fiscal year 2016. Though the number of sales of EV "Leaf" is presently 8200, to meet wider needs, they expand kinds of models and put into the market newly seven models following Leaf. About the feeding power function from EV President Ghosn says that electricity at home can be supplied with one EV for two days, clarifying that the company is going to test for practical use. Moreover, he says that the company aims to cooperate with Daimler in Germany about FCV for the market 15-16 years later. (The Sankei Shimbun, The Denki Shimbun, the Nikkei Business Daily, Nikkan Jidosha Shimbun and Fuji Sankei businesses i, June 28, '11)
(2) Mitsubishi Motors Co., Ltd.
Mitsubishi Motors Co., Ltd. announced that the substantial purchase expense of a low-priced type of EV"i-MiEV" scheduled to sale on July 6, 25 became 1,880,000 yen. This model will be greatly remodeled this summer, preparing for two types of models and the distance to empty of one type marketed in August extends from 160km to about 180km per one charging compared with the present car. On the other hand, the price of a low-priced type vehicle assumes 2,600,000 yen, and using the upper limit 720,000 yen of the government purchasing subsidy, the substantial purchasing expense becomes 1,880,000 yen. The one of the type based on the present car is 3,800,000 yen. This company also opened the prototype of the power supply feeder supplying power to the home where a lot of electricity is consumed as supplying power to rice cookers from EV on July 6. (The Nikkei, July 6, 7 '11)
(3) Toyota Corolla Kyoto Co., Ltd.
Toyota Corolla Kyoto (Kyoto-city) held " Motor Festival 2011" designed for the 50th anniversary of establishment at Pulse Plaza on July 2, 3, where about 11000 people entered and 201 cars were sold. In the exhibition of cars, EV "Tesla Roadster" which is unusual in the country. attracted attention (Nikkan Jidosha Shimbun, July 7,'11)
(4) Nagoya University
On July 8 the ceremony of the anniversary of establishment of "Research Center coordinated with Green Mobility" that researches the next generation car such as EV and FCV comprehensively was held at Nagoya University. It will work on the technology development and the talent promotion of the next generation car in the future. Under the assistance of Ministry of Economy and Industry and at expenses of about 1,500,000,000 yen, the building with 2800m2 in total, and of four floors on the ground and one floor under the ground was completed in the university premises in February. (The Chunichi Shimbun,July 9,'11)
(5) Suzuki Co., Ltd.
Suzuki Co., Ltd. produced experimentally EV based on the light commercial vehicle "Every" and started the running experiment in the public road. The company rents 13 EVs to Suzuki agencies in the whole country including Hamamatsu-city and uses 10 EVs for the demonstration experiment of "Hamamatsu next generation environmental vehicle society experiment conference" held in the city this autumn. EV Every has riding capacity of two persons and can load luggage up to 250kg. The lithium-ion battery of 13 kilowatt-hour in capacity was installed, and the mileage 100km at the full charge was secured. (The Shizuoka Shimbun, July 13,'11)

8. FC movable bodies other than vehicle
Airbus and German Aerospace Center succeeded in the experiment having aircraft driving on the ground using FC. In the examination FC and the electric motor were installed in small size aircraft A320 of Airbus, and the aircraft was running with the front wheel driven on the ground. When the aircraft moves between the terminal and the runway this technology is used. Airbus applies this technology to the aircraft of the next generation. Airlines authorities in Europe hold up the aim to decrease CO2 emission from the aircraft to half of the present in 2020. (The Nikkei

Business Daily, July 12,'11)

9. Hydrogen station business

The High Pressure Gas Safety Institute of Japan starts the investigation of the restriction situation of the hydrogen station and regulatory control etc. of car air conditioner refrigerant in America and European countries. The purpose of investigating of the hydrogen station is to refer to the case with Europe and America in inspecting comprehensively the necessary restriction for the spread of FCV, concretely to collect information on the distance between equipments when linked with the compressed natural gas stand and the distance between the public road and dispencer. Moreover, its purpose is to searches for the ideal way of charging action of self charging hydrogen stand and the charging place corresponding with gas shortage on the public road. This business was contracted as the commissioned project in the fiscal year 2011 of Ministry of Economy and Industry which amount to about 22,000,000 yen in total. (The Nikkan Kogyo Shimbun, July 22,'11)

10. Development and business development concerning hydrogen production and refinement

(1) Hokuriku Green Energy System Society

Hokuriku Green Energy System Society (Takaoka-city) executes charging by field service of the electric assistance bicycle rent in Tokyo Bunkyo Ward for one month from August 1. Hydrogen is generated by reacting high-purified aluminum made from the paper pack with aluminum collected in the cooperation of the resident and the municipality with sodium hydroxide. It is a method to convert the obtained hydrogen into the electric power by FC to use for charging. FC of output 100W can be operated for one hour with high- purified aluminum 60g. (The Hokkoku Shimbun, June 28 '11, Fukui Shimbun, July 26)

(2) University of Oxford

The research team of University of Oxford Department of Chemistry developed the catalyst which took out hydrogen, decomposing formic acid at room temperature not using the solvent or the additive. A single-layer atomic thin film of the palladium atom is arranged in the nanoparticle of silver, the catalytic action of palladium is improved by electronic effect of silver, and the formic acid is decomposed into hydrogen and CO2. The hydrogen produced from the formic acid with this catalyst can be used as mini FC fuel for the cellular phone and the notebook computer. The achievement of hydrogen FC of pocketable size can be expected in the future. (The Nikkan Kogyo Shimbun, July 5,'11)

11. Development and business deployment of FC accessory technology

Nitto Seiko Co., Ltd. of the major industrial screw maker developed a stainless screw uniting the rust prevention ability and the performance of screwing. It was made feasible by combining austenitic stainless steel used as anti-rust measures with the newly developed compound surface treatment technology. This stainless screw is proposed
to the enterprise of air conditioner outdoor machine that set up in outdoors often and increase of the number of installations will be expected in the future, enterprise of FC for household use and EV charging equipment-related enterprise.

This stainless screw is marketed by the name of "El Rifa". (Nikkan Jidousha, the Kyoto Shimbun, June 24 '11, Dempa Shimbun, June 29, The Nikkan Kogyo Shimbun, June 30)

12. Development and business development of FC and hydrogen-related measurement observation equipment

Aichi Tokei Denki Co., Ltd. (Nagoya-city) puts the electromagnetic minute flow sensor "VNR" which measures minute, liquid flow of 1-12mL per minute on the market on July 1. It is excellent in durability because there is no obstacle in flow passage compared with usual heat ray type etc. The flow passage was miniaturized to 0.3mm in height and 3mm in width by MEMS technology. The price is 80,000 yen and sales of 500 sets are prospected for medical application and FC-related at the first year. (The Nikkan Kogyo Shimbun, June 30,'11)

-This edition is made up as of July 27, 2011-

A POSTER COLUMN

Ten major companies start up "HEMS Alliance".

Ten major companies (KDDI, Sharp, Daikin Industries, Tokyo Electric Power, Toshiba, NEC, Panasonic, Hitachi, Mitsubishi Motors, and

Mitsubishi Electric) announced that they started up the joint discussion system "HEMS Alliance" concerning HEMS (Home Energy Management System) on July 12. The discussion concerning environmental maintenance of HEMS and smart household electronic equipment spreading like the mechanism etc. of the HEMS application which connects and controls smart household electronic equipment of different makers mutually is advanced. A constant result is scheduled to come out in three years, and they aim to create two or more functions to achieve conservation of energy in the house next summer.

To promote the optimal use of energy in the house, connecting mutually smart household electronic equipment group of each company with the home controller and HEMS application, making visible the electric power use state of each equipment, and the achievement of smart house where the power demand is optimized at the entire house through automatic control are indispensable.

A necessary mechanism framewoking for, to say nothing of the technical standard, interchangeability of smart household electronic equipment, the application development and circulation, and the maintenance of smart household electronic equipment, etc. becomes the issue of the achievement of smart house.

They cooperate properly with each group such as Smart Community Alliance (JSCA) and the house makers when examining. They work on the problem solution for the establishment of the HEMS market with a key word “safety and security”. Moreover, they consider expanding the object besides household electronic equipment such as the gas equipment and FC.

(The Chemical Daily, July 13,'11)

Example of demonstration experiment of energy management in building and house

(1) Tokyo Institute of Technology

The building for the research which aims at self sufficiency by the solar battery and FC is completed at Tokyo Institute of Technology, Ohkayama Campus. It has seven floors on the ground, one floor under the ground with 9500m2 in total area, and is scheduled to open in March, '12. The power supply consists of the solar battery (4500 pieces of panels, 650kW) and FC(100kw), and the solar battery panel is set on the whole sides excluding the northwest of the building. Moreover, the nature power such as "cool heat pit" sent in the building after cooling down the hot air of the outdoor in summer by the space in the building underground has been used at maximum. (Tokyo Shimbun, June 26,'11)

(2) Aqurahome

Aqurahome started the demonstration experiment aiming at the development of an independent house with the storage battery lowering the price in Saitama prefecture. It is equipped with energy-vreating equipment such as photovoltaic power generation system and ENE-FARM and low-priced storage batteries with comparatively small capacity. Aqurahome cooperates with the Waseda Environmental Institute. Moreover, Aqurahome also develops at the same time the combination with HEMS which make the electricity output and the quantity consumed visible. (Jutaku-Shinpo, June 28,'11)

(3) Toyota Motor Co., Ltd,

On June 30 Toyota Motor Co., Ltd, announced that they completed the house that introduced the energy management system (EMS) that the construction was carried forward in Aichi Prefecture Toyota-city was, and began the experimental operation of the system. Toyota Motor introduces HEMS into the house, and photovoltaic power generation, FC, domestic storage battery, EV, PHV, and smart household electronic equipment, etc. are tied up, and they aim at the optimization of the power supply and the equipment control. The system which supplies the electric power saved in the storage battery of the vehicle with the house is demnstrated. (Nikkan Jidousha Shimbun ,July 1,'11)

(4) KDDI

KDDI develops applied software to control household electronic equipment with different standards collectively with one controller. The research and development union body (consortium) is working on the demonstration experiment " Toyota-city low carbon social system demonstration project" which is advanced in Aichi Prefecture Toyota-city looking steadily at the spread of the energy-saving house "Smart house". Two or more special hardwares for the

household electronic equipment control are made unnecessary by building software into the set-top box (converter of the broadcasting signal), and the cost reduction and space -saving are aimed at. (The Nikkan Kogyo Shimbun, July 25,'11)

(5) Mitsui Fudosan Co., Ltd.

Each real estate company is giving its name successively to the development of the environmental type city "Smart city" which considered energy saving. Mitsui Fudosan constructs the condominium and the office building in the core division of "kashiwa no ha campus city" with about 24,000m2 in area. The amount of the investment is about 17,000,000,000 yen and the completion is scheduled in the spring in 2014. The electric power made from the sunshine, the wind force, and the bio-power generation is managed collectively by IT control in the city. The mechanism that residents and persons who work in the office can always confirm the energy demand and supply by the monitor anytime is adopted, and with a target to urge saving electricity to reduce energy quantity consumed by half at maximum, the smart grid by which the power supply can be efficiently adjusted is introduced, and the mechanism where energy is accommodated each other in the region is also adopted in the future. (Fuji Sankei Business i,,July 27,'11)