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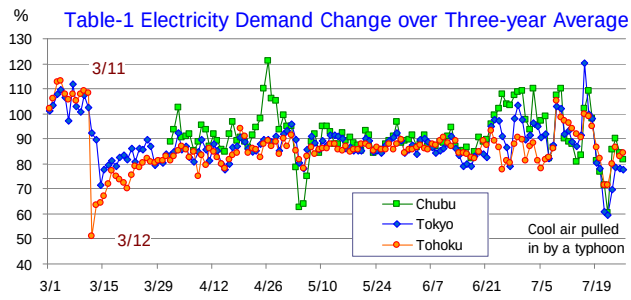
Japan weathering summer with power saving amid uncertainties

High summer has arrived in Japan about a week earlier than usual with the Meteorological Agency declaring the end of the rainy season early July. Japan faces a peak energy demand season, while power generation capacity remains significantly lower as most of the nuclear power stations in eastern Japan are out of service due to the March earthquake and many others are facing difficulties restarting after routine inspections and maintenance due to communal reservation. The Japanese government invoked a 15% power reduction order for large consumers in eastern Japan effective July 1st. Every morning TV news airs "electricity forecast" projecting the peak demand for the day and the maximum utilization factor. The entire nation is now in power saving mode; a wide variety of energy saving measures are taken at factories, offices and households. Power demand in eastern Japan is running slightly below previous years, while economic activities are recovering.



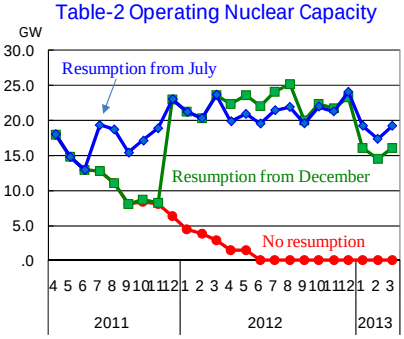
Meanwhile, additional accidents occurred at power plants in western Japan in mid July, more than eating up the expected supply margins. The No.1 unit at the O-i nuclear station of Kansai Electric Power Company (EPC) (1.175 GW) was shut down due to mechanical troubles on the emergency cooling system, followed by a shut down of the No.1 unit of the Misumi coal thermal plant of Chugoku EPC (1.1GW). As western Japan is now facing power shortage as well, the entire nation of Japan is struggling to pull through this summer.

On July 19 Tokyo EPC announced that the first stage of the roadmap to stabilize the Fukushima reactors has been achieved (generally but not completely) by the middle of July as scheduled. A cooling system to recycle water through decontaminating radioactive agents is

now getting on track overcoming a number of setbacks and difficulties. Nitrogen is injected into reactor vessels to reduce the risk of a hydrogen explosion. However, a number of other issues are yet to be resolved, while many residents are still kept at evacuation centers. Tokyo EPC also announced on the same day a revised roadmap for establishing more reliable cooling systems in the second stage of up to January next year, and to commence extraction of damaged nuclear fuel rods and early work for dismantling the damaged reactors in the medium term to follow.

Future Power Supply & Demand and Energy Procurement

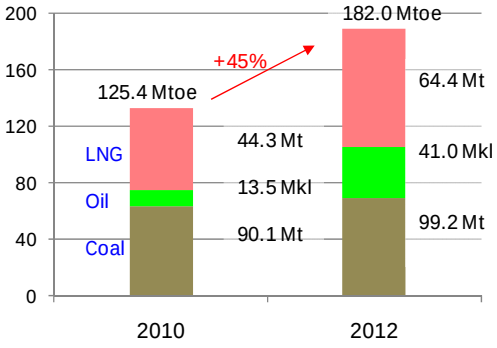
Table-2 Operating Nuclear Capacity



Currently 38 nuclear reactors out of a total of 54 are shut down due either to the earthquake or routine inspections, including the Hamaoka nuclear power plants shut down following the request of Prime Minister Naoto Kan. Remaining 16 reactors in operation ought to go into routine inspections by June 2012. After substantial controversy and confusion related to the conditions for restarting, the Japanese government finally released on July 11th their unified views that the nuclear plants must undergo so-called "stress tests" before they are allowed to restart. The government further announced that primary and secondary stress tests should be carried out to determine whether a dormant reactor could be restarted or whether an operating reactor should be shutdown, respectively. The government will review and decide on specifics of how and when the stress tests are to be executed. At any rate, the out-of-service nuclear power plants due to routine inspections and maintenance will not come back online to meet this summer's peak demand.

Keeping the nuclear units dormant will put Japan in a serious power deficit. During the summer of 2012, in particular, the power deficit is likely to become more serious nation-wide. IEEJ estimates that the total generating capacity of Japanese electric utilities, excluding mothballed thermal power stations, will be 7.8% less than the projected peak demand if no nuclear units were to restart. The deficit will translate into a 12.4% power savings requirement with a 5% of minimum reserve needed to ensure a stable supply of electricity, seriously affecting industrial activities as well as daily life.

Million toe Table-3 Fossil Fuel Requirement increasing without Nuclear



Thermal power stations will have to be kept operating at extremely high rates year-round unless economic contractions or significant power savings take place. Fuel consumption at the thermal plants is dramatically increasing to raise fuel procurement costs on coal, LNG and oil to the tune of 3.50 trillion yen against that of FY2010. Dividing the amount by the total electricity generated equates to an incremental cost of 3.7 yen/kWh, or 18% and 36% increases on electricity rates for households and industries, respectively. The significantly higher electricity bill will have a serious adverse effect on the competitiveness of Japanese industries. At the same time, burning substantially larger amounts of fossil fuels will increase Japan's CO_2 emissions in FY2012 to 1.26 billion tons, or 18.7% over the 1990 level. A series of special reports on energy issues arising from the March earthquake are posted at IEEJ's website; http://eneken.ieej.or.jp/en/whatsnew/energynews.html.

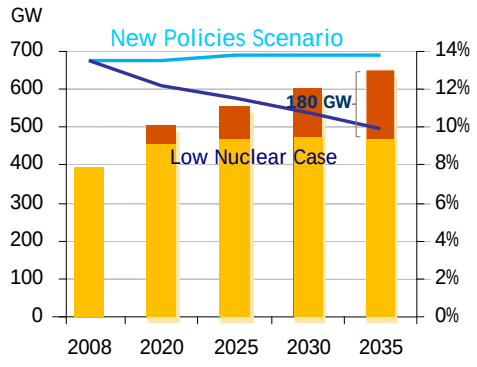
Review on Long-Term Energy Policies

The Fukushima Daiichi incident has cast serious doubts on safety and credibility of nuclear and its role in power supply, which was once expected to take a central position in Japan's energy policies. As reported earlier, Prime Minister Naoto Kan had already requested a thorough review and reevaluation of the Japanese energy policy. After the unprecedented nuclear accident, social and political considerations may have a greater impact on the review in addition to economic and technological analyses. Undoubtedly, it is now extremely difficult to maintain the original target of raising the nuclear generating capacity to 68GW.

In the yet-to-be-revised Basic Energy Plan with a likely cut back on nuclear dependency, Japan will have to extensively promote (1) renewable energies, (2) energy and power savings, and (3) fossil fuels combined with CCS (carbon capture and storage). Prime Minister Kan advocated that Japan should pursue a four-pillar energy policy by adding natural energies and energy savings to the existing one centered on fossil fuels and nuclear energy. Such a concept requires that all of renewable energies, incremental energy savings, and "thermal plus CCS", having considerable uncertainties in terms of economic and technical feasibilities, make up for a significant portion of the energy supply. Various combinations of measures are being considered to achieve this, but it is not easy to find a feasible solution with a lowered nuclear capacity as the present plan already factors in ambitious targets to substantially enhance each of these measures. These measures should also be examined to determine if they are practicable for a large scale application in the Japanese economy, society and geography. Despite the difficulties, however, Japan appears to have no other way but employing multiple strategies as above to ensure energy security while simultaneously addressing the global warming issue.

Nuclear is indispensable option for Japan, says Tanaka of IEA

At the IEEJ Energy Seminar held on July 19, Mr. Nobuo Tanaka, Executive Director of the International Energy Agency (IEA), presented the latest assessment of the world energy outlook after the Fukushima incident. Its low nuclear scenario assumes slower growth of nuclear power compared with the one projected in the 2010 Outlook. Incremental nuclear generation capacity is projected to be one-half of the previous case, and the share of nuclear power in the total primary energy supply for 2035 declines from 14% to 10%; retirement of old nuclear plants will be accelerated whereas construction of new plants will be delayed. These setbacks in nuclear power development would entail huge increases in other energies; 130 Mtce of coal equivalent to the present steaming coal export of Australia, 80 Bcm of natural gas comparable to the current LNG production capacity of Qatar and 460TWh of renewables that is five-times the renewable energies presently produced in Germany, all together. Natural gas consumption will be much greater than the projection indicated in the latest IEA synopsis described in its "Golden Age of Gas" scenario. The amount of CO_2 emissions will increase by 0.5 Gt or about 30% as a result of increased use of fossil fuels.



Source: IEA

The 450 ppm scenario to control the global temperature increase to within 2 degree C seems almost impossible in view of the deficient agreement reached in Copenhagen and the slower nuclear power development now anticipated. Given such a situation, it is more important to take a bottom-up approach with each nation taking every conceivable measure to achieve as

much emission reductions as possible. In addition to energy saving and renewable energies, nuclear, premised on assured safety, continues to be an important option.

Mr. Tanaka told the audience that Japan should consider a new energy best mix in the light of energy security, energy cost and preservation of environment, including nuclear as an important option. Energy security should no longer be considered only in terms of oil supply as in the past. It should be considered more on stabilized supply of electricity and gas, which needs to be secured through extensive development of national and regional networks of electricity as well as natural gas, even involving adjacent nations. While energy prices are anticipated to continue its inflationary course, Japan must construct a low-carbon society by developing innovative technologies in every field covering energy efficiency, renewable energy, nuclear, smart grids, electric vehicles, etc, to maximize its economic and industrial strengths. Mr. Tanaka concluded by summarizing that Japan should consider the Fukushima Daiichi incident not just a dreadful disaster but a springboard to open up a new era.

Post-Fukushima nuclear policy to affect future CO_2 emissions

A study team at IEEJ led by Dr. Ryoichi Komiyama, visiting researcher of IEEJ and Assistant Professor at the University of Tokyo, analyzed nuclear power scenarios up to 2050 focusing on the possible impact of the Fukushima Daiichi incident on Japan's energy policy. The team analyzed a variety of options based on the energy demand estimated by an econometric model, and applying technology comparison by way of cost minimization with a MARKAL LP model.

Trends in the Japanese economy, which affect the energy demand projections, are assumed as follows:

1) While the national population continues to decline, the Japanese economy will grow slowly but steadily until 2050 thanks to technological advancement. Per capita GDP will increase by 1.7% annually between 2005 and 2050.

2) Oil prices will increase, as estimated by the IEA, up to a nominal price of $300 per barrel in 2050 (3.3 times the 2008 level). LNG prices will follow a similar trend, while coal prices will increase at roughly half that rate (1.7 times the 2008 level).

Subsequently, impact of variations in the nuclear power generation capacity is analyzed for three scenarios, with focus on the cases where "CO_2 emissions will not be controlled" and "CO_2 emissions will be reduced by 30% in 2030 and 60% in 2050, both from the 2005 level."

Scenario 1: The installed nuclear power generation capacity in 2030 (68 GW) projected in the Basic Energy Plan of 2010 will be maintained in 2050, which is substantially higher than the 48.8 GW existing before the Fukushima incident.

Scenario 2: The Fukushima No.1 Power Plant will be decommissioned, whereas the Fukushima No.2 will resume operations in 10 years' time. New plants except for the Higashidoori Plant of Tokyo EPC will be constructed as scheduled. Thus, the installed nuclear capacity is projected to increase to 57 GW in 2050.

Scenario 3: Both the Fukushima No.1 and the Fukushima No.2 (9.1 GW in total) will be decommissioned, and nuclear power plants already under construction only will go on line. Nuclear power plants will be decommissioned after 60 years of service. This scenario results in a total nuclear power generation capacity substantially decreasing to 22 GW in 2050.

According to Scenario 1, Japan's primary energy supply will decrease from 500 million tons of oil equivalent (toe) in 2005 to about 360 million toe in 2050 or a 28% decrease, even in the case

of "no restrictions on CO_2 emissions," reflecting a continued decrease in the population and increase in energy efficiency through advancement of technologies and changes in the industrial structure. By energy source, the proportion of oil and natural gas will decrease as their prices soar, while that of coal and nuclear power will increase. In particular, oil will see a significant decrease from the current 45% to 22%.

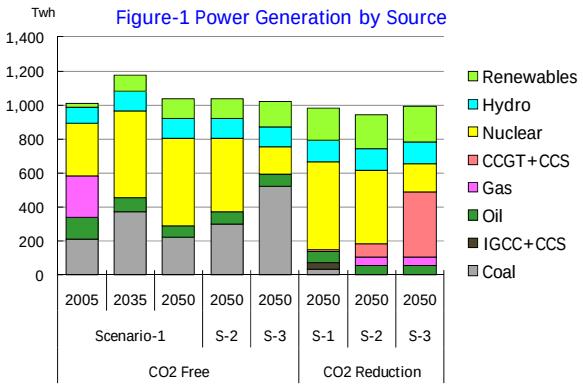


Figure-1 Power Generation by Source

In the case of "no restrictions on CO_2 emissions," the consumption of relatively cost-effective coal will increase significantly as the nuclear power generation capacity decreases. Compared to Scenario 1, coal consumption will increase by 23 million tons per annum (MTPA) in Scenario 2, where the installed nuclear capacity is 11 GW lower, and by 90 MTPA (63 million toe) in Scenario 3, where the nuclear capacity is 46 GW lower. Natural gas will not be chosen as a fuel for power generation. CCS (carbon capture and storage) will not be adopted either because of lack of restriction on CO_2. With coal substituting for nuclear power, CO_2 emissions will increase by 60 million tons in Scenario 2 and by 250 million tons in Scenario 3, both compared to Scenario 1. The proportion of nuclear power, which stood at 31% in 2005, will increase to 49% in Scenario 1 and to 42% in Scenario 2, while it will decrease to 16% in Scenario 3.

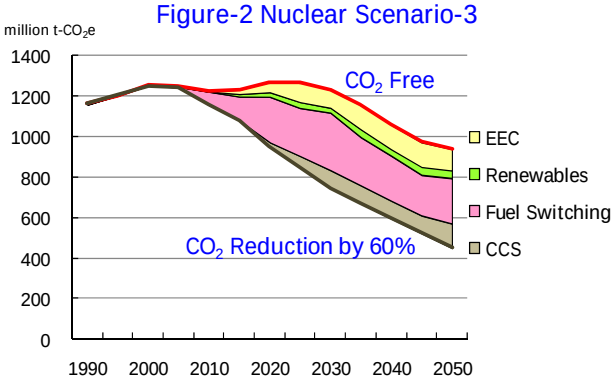


Figure-2 Nuclear Scenario-3

In the case of "CO_2 emissions being restricted," on the other hand, the marginal cost of reducing CO_2 emissions will increase significantly over the long term, which will urge energy saving. As a result, primary energy consumption will decrease by 9%–11%, compared to the cases of "no restrictions on CO_2 emissions." With LNG substituting for nuclear power, natural gas consumption will increase by 25 million tons (LNG equivalent) in Scenario 2 and by 65 million tons in Scenario 3 from Scenario 1. The total LNG imports will increase from 34 million tons in Scenario 1, to 58 million tons in Scenario 2 and to 98 million tons in Scenario 3. The proportion of renewable energy will also increase marginally. In Scenario 1, coal accounts for 12% of the power generation mix, while it is totally eliminated in Scenarios 2 and 3. In Scenario 3, CO_2 emissions from combustion of LNG, a substitute for nuclear power, will increase by 70 million tons in 2030 and by 190 million tons in 2050, compared to Scenario 1, which will result in the need to promote CCS extensively. In Scenario 1, where the installed nuclear power generation capacity increases substantially, coal-based IGCC with CCS will be adopted, while natural gas-based CCGT with CCS will be adopted in Scenarios 2 and 3, which do not involve the use of coal. The amount of CCS will remain at 30 million tons a year in Scenarios 1 and 2, while it will need to be boosted to 120 million tons in Scenario 3, as the nuclear power generation capacity is decreased by two-thirds. Since Japan lacks large scale underground reservoirs of oil and natural gas, it would not be feasible to implement CCS at such a large scale involving gas-fired power plants operating at coastal locations. This issue must be further examined. Meanwhile, as energy-saving measures are gaining momentum,

the proportion of nuclear power is estimated slightly higher at 52% in Scenario 1, 46% in Scenario 2, and 16% in Scenario 3.

From the study results described above, the following suggestions could be obtained:

Drastic reductions in CO_2 emissions as mentioned above will have to be pursued via multiple measures in consideration of cost effectiveness, technical constraints, as well as environmental advantages/disadvantages of various technologies. In particular, the marginal cost for reducing CO_2 emissions will reach \$800/ CO_2-t (real price in 2000) in Scenario 1 and as high as \$1,200 / CO_2-t (up 40%) in Scenarios 2 and 3, if CO_2 emissions will have to be reduced by 60% from the 2005 level in 2050. Such high marginal costs pose a variety of challenges to the society on the one hand, which will hopefully lead to the emergence of innovative technologies and systems in supply and use of energy on the other. For that matter, radical changes are needed in the social system and economic structure in the post-Fukushima era.

Australia's gas sector fuels economic growth across the Asia-Pacific

On July 19, IEEJ held the "Joint Australia-Japan Energy Seminar" in Tokyo inviting high officials and top business leaders from both countries. Mr. Tadahiro Matsushita, Senior Vice Minister of METI, welcomed the Hon Martin Ferguson AM MP, Minister for Resources and Energy, Minister for Tourism, Australia, visiting Japan at a critical time when Japan is struggling with energy issues after the Fukushima Daiichi incident.

Mr. Ferguson in his keynote address stated "while the March earthquake raised longer term questions around appropriate energy mix for Japan, we all know decisions regarding energy platforms are never taken lightly. Given the large sums of sunk capital, significantly changing a market's energy mix will take time."

"Supporting the Japanese recovery with supplies of energy, Australia is ramping up production of energy and resource commodities. In particular, strength of the relationship between two countries is clear when it comes to LNG, and, in light of efforts to reduce greenhouse gas emissions while maintaining energy security, the importance of gas cannot be overlooked."

"With a number of on-going new projects, Australian LNG exports could top 50 million tonnes a year within five years, pushing it up to the position of world's second-largest LNG exporter after Qatar. Australia is now moving into a unique position with three LNG production modes i.e. conventional offshore gas with onshore LNG production, offshore floating production (FLNG), and coal seam gas (CSG[1])-based LNG production, which means a secure source of LNG imports for Japan. Australia's gas sector fuels economic growth across the Asia-Pacific, and we welcome foreign investment in our resources and energy sectors."

Following the keynote speech, Dr. Ken Koyama, Chief Economist and Managing Director of IEEJ, and Ms. Jane Melanie, General Manager, Resources, Energy and Trade, Bureau of Resources and Energy Economics, presented their views on energy strategies and perspectives on gas and LNG markets.

[1] CSG is generally known as "Coal Bed Methane" or CBM.

Presentations were also made on major LNG projects by Mr. Michael Hession, Senior Vice President - Browse, Woodside Energy Limited, Mr. Peter Cleary, Vice-President, Strategy & Corporate Development, Santos Limited, Mr. Kurt Lindahl, General Manager, Chevron International Gas Inc. Japan Branch, and Mr. Naoki, Kuroda, Chairman and CEO of INPEX Corporation. These presentations dealt with various innovative ideas and measures being introduced to reduce costs and make the projects viable. One participant commented that, endowed with abundant gas resources, if all the planned projects materialized, Australian LNG production might overtake the present export capacity of Qatar, the world's biggest producer, in the foreseeable future, while Japan will continue to be the world's largest LNG importer. Given these perspectives, said Mr. Hession, both buyers and sellers should jointly develop the LNG industry based on a long term relationship. According to Mr. Yutaka Kunigo, Senior Executive Officer, Chief Executive of Energy Resource Division, Tokyo Gas Co., Ltd., the Japanese LNG consumption will continue to increase, and much more so after the Fukushima incident. He asked for continued cooperation by relevant Australian parties in developing stable LNG supply at sound economic conditions to accommodate the ever-increasing Japanese demand. (Proceedings will be available shortly at IEEJ's website)

Momentum is rising on geothermal development in Japan

Despite its abundant geothermal resources ranked third in the world, the geothermal power generating capacity in Japan has remained at 540,000 kW or a mere 0.3 percent of the total electricity generation capacity without any new project since 1999. Its history dates back to 1966, when Matsukawa Geothermal Plant in Iwate Prefecture began operation; it still produces power today. Adequate technologies and experiences are available as Japan has supplied a 70 percent of the geothermal plants worldwide. Nevertheless, geothermal power has been stalled in Japan over decades, mainly due to its high generation costs and regulations[2] on project development inside national parks, where more than 80 percent of Japan's high-temperature hot water resources is located.

With growing expectations on renewable energy, there are some movements for policy change. First, a renewable energy feed-in-tariff (FIT) bill is going to be introduced this summer, encouraging domestic development and investment. Second, the cabinet decided in June 2010 to review guidelines for national park regulations to promote the use of renewable energy. The assessment has started on June 28 at a meeting of the Study Group on Environmental Impacts Associated with Geothermal Power Projects. If the regulation on developing geothermal projects in national parks would be eased, a significant room will be opened with improved economics. The Japan Geothermal Developers' Council (JGDC) estimates that a 620,000 kW of geothermal power could be introduced at an electricity purchase price of 24.5Yen/kWh, which could increase by another 1.67 million kW (to a total capacity of 2.29 million kW) if new projects are allowed within the currently prohibited national parks.[3]

The industry is quickly responding to the promising policy change. Mitsubishi Materials Corporation and Tohoku EPC announced a joint project employing directional drilling to access geothermal energy resources underneath a national park in Akita Prefecture. From the oil industry, Idemitsu Kosan and INPEX Corporation have agreed to conduct joint studies for launching geothermal power projects in Hokkaido and Akita Prefectures. Kyushu EPC will

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[2] The government has restricted the use of geothermal resources located in natural parks since 1972, when it issued a notification not to promote new development projects for landscape conservation reasons.

[3] Hearing by METI on views on a FIT scheme for renewable energy dated November 30, 2009.

initiate studies for introducing a binary cycle power plant, the second unit in Japan after the Hacchobaru Geothermal Power Plant in Oita Prefecture commissioned in 2006. JFE Engineering will launch a study on a new project capitalizing on its experiences in installing steam plants at nine geothermal power stations in Japan.

However not all factors present optimistic prospects. Under the FIT scheme, the power purchase price is likely be set in a range of 15 - 20 Yen/kWh for a period of 15-20 years. A single price is going to be applied for all renewable energies, except for solar energy, regardless of differences in cost and technical characteristics. The Ministry of the Environment (MOE)[4] estimates geothermal introduction potential at 4.23 million kW, while METI[5] puts it at 1.13 million kW, both with a power purchase price of 20 Yen/kWh. However, JGDC, an industry association, indicates a much lower estimate at approximately 300,000 kW[6], saying that projects would become hardly commercial at a purchase price below 20 Yen/kWh. Industrial parties have yet to establish confidence in investments, given the low profitability of the existing projects. If the government considers that geothermal power is a promising renewable energy to be extensively developed, it needs to set out a clear and consistent policy based on a long –term perspective.

Energy Committee Highlights

Key issues discussed for review of energy policy

The first meeting of the Energy-Environment Council, chaired by Koichiro Gemba, Minister of State for National Policy, was held on June 22 and discussed key issues for formulation of the "Innovative Energy and Environment Strategy." The council was set up at the decision of the ninth meeting of the Council for Realization of the New Growth Strategy, headed by Prime Minister Naoto Kan, held on June 7.[7] It is assigned to formulate innovative energy strategies as an important element to be integrated in the Basic Revitalization Strategy of Japan in collaboration with METI, who is responsible for the Japanese energy policy.

The new strategy must rectify the imbalance and remove vulnerabilities in Japan's energy systems while satisfying the needs for safety, stable supplies, efficiency, and environmental-friendliness. It should set out short-, medium- and long-term action plans focusing on the utilization of a new best mix of energy sources. At the June 7 meeting, it was argued that, in addition to the safety issue, the cost of nuclear power generation should be fully examined while it had long been touted as being inexpensive, and that innovation on technology and enhancement of market competition would be necessary to minimize the anticipated cost increase in establishing a new energy best mix with capacities to cope with

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4 Study of Potential for the Introduction of Renewable Energy (FY2010) Probable introduction amount under a FIT scheme with a purchase period of fifteen years. Even when the purchase price is 15 Yen, an estimate of 1.08 million kW can be introduced. Hot spring power generation (employing existing high-temperature hot springs and thereby not incurring drilling costs) is included for all estimations.

5 Interim Report by the Study Group on Geothermal Power Generation (2009) Includes hot spring power generation employing low-temperature hot springs and hot springs and an additional 240,000kW in existing plants.

6 Interview-based material, handouts from Mid-and Long-Term Roadmap Subcommittee, June 3, 2010

7 The National Policy Unit (NPU), established under the Office of Prime Minister, reports directly to the prime minister and acts as a command center to promote cross-ministerial planning and coordination. The Unit was created to enhance political leadership following the historic change of power on September 16, 2009, which put the Hatoyama Administration into office. One of the main functions of the NPU is to plan and coordinate basic frameworks for tax and fiscal policy, as well as economic management, and to draw up special policies at the behest of the prime minister, such as to Follow up of the New Growth Strategy and Fiscal Management Strategy, for example, (http://www.npu.go.jp/en/)

social, economic and environmental risks.

The meeting on June 22 set out three principles for the future strategic discussions. First, the new energy strategy should be established via multi-faceted approaches. The present Basic Energy Plan, which was revised in June 2010 placing half of its future electricity supply burden to nuclear, should be completely revamped, while practicable solutions should be sought in the interim so that energy supply could be secured in a manner not to hamper stable economic growth.

Second, in order to dispel anxieties on economic deterioration and the so-called "hollowing out of industry" due to energy constraints, energy supply stabilization policies should be established for urgent implementation. Such policies should be structured along an adequate combination of various measures, major elements of which should include enhanced energy efficiency and conservation, utilization of natural gas as well as privately owned power plants, proactive use of renewable energies, and full assurance of safety at existing nuclear power stations.

Third, the council should sort out guiding principles for configuring the Innovative Energy and Environment Strategy as a part of the Basic Revitalization Strategy of Japan, which should lead socio-technical innovations and drive economic development. The nation should seek for solutions for energy and environmental challenges backed by sound technology and policy measures, and should lead the world producing solutions against new challenges of the time. In addition to the existing two pillars of nuclear and fossil energies, energy efficiency and conservation and renewable energies should be newly placed among the main pillars. Prime Minister Kan said in his address at the meeting, "Energy policy had always been a very important issue, irrespective of the nuclear incident. Even before the Fukushima incident, the New Growth Strategy had identified renewable energy and other forms of energy as springboards for growth. I want to continue to work hard to press this forward."

It was agreed that new strategy should be based upon a new paradigm, not a mere improvement on the old centralized system, and aim at construction of a new energy system extensively introducing distributed energy supply. The council will compile the interim report in July, develop fundamental missions for the Innovative Energy and Environment Strategy together with the "Green Innovation Strategy" by the end of the year, and finalize the Strategy in 2012, as a part of the New Growth Strategy, with medium to long term goals on expansion of employment and market, materialization of green innovation, and creation of a new energy best mix.

At a core member meeting of the council by vice-ministers held on June 27, the gist of the draft interim report was presented. It stipulated measures for immediate actions against electricity shortage and energy cost control on both supply and demand aspects. On the supply side, they included review of regulations on renewable energy sites, acceleration of electricity trade, reinforcement of power linkage system, and the review of third party access rules to better utilize privately owned generation capacities. On the demand side, energy efficiency and conservation (EEC) and demand side management (DSM) are placed as its pillars, which should be enhanced by diversified electricity tariff system, peak-cut measures to be adopted by users, advanced introduction of smart meters, and review of grid control rules to promote renewable energies and diversified power sources. The interim report is scheduled to be finalized within July. After that, the council plans to investigate medium to long term issues including unbundling of electricity generation and transmission and the appropriate position of nuclear power in the electricity supply mix.

Energy News in Japan & Asia

Japanese oil companies recorded substantial profit increase in 2010

The Petroleum Association of Japan released on July 7 the financial results of its member companies for the year 2010; i.e. for the accounting period ending December 2010 for five companies and that for March 2011 for eight companies. The former group came out of deficits recorded in the previous year, while the latter group recorded more than four-fold increase in the current profit.

	Sales Quantiry		Turnover		Current Profit	
	Million KL	%	Billion Yen	%	Billion Yen	%
(Year ended December 2010)						
TonenGeneral	2.96	-3.7	2,393	+14.5	58	-
Toa Oil	Processing for others		28	+2.4	2	-
Showa Yokkaichi	Processing for others		32	-10.5	1	-9.3
Showa Shell	2.96	+1.5	2,204	+16.2	40	-
ExxonMobil	Not disclosed		1,570	+16.5	32	+105.3
Total	5.92	-1.2	6,226	+15.3	134	-
(Year ended March 2011)						
Idemitsu	3.35	+0.9	3,276	+14.3	84	-
Kahima Oil	0.01	+86.4	38	+3.0	2	+13.0
Taiyo Oil	0.79	+3.5	567	+15.2	10	+8.5
Fuji Oil	0.79	+8.8	467	+18.2	6	-
Cosumo Oil	3.88	-2.1	2,551	+9.4	51	+117.2
Mitsui Oil	0.58	-0.5	428	+9.4	12	+342.3
JX Holding	10.94	-3.3	8,132	+6.9	254	+284.4
Seibu Sekiyu	0.64	-4.1	406	+4.6	3	+83.8
Total	20.99	-1.7	15,866	9.3	420	+319.5

Sales of gasoline, naphtha, kerosene and diesel oil as well as fuel oil for power generation recorded increases reflecting hot summer and cold winter. However, the total sales amount recorded a slight decrease as industrial users continued switching from oil to city gas. Their financial results were improved significantly as the refining margins were improved and a substantial inventory gain was recorded because of the crude oil price hike experienced in 2010. Among oil companies, JX Holding and Cosmo Oil set aside the special losses of 126 billion yen and 56 billion yen while their refineries were severely hit by the great earthquake and tsunami of March 11. Most of the companies expect similar business performance for 2011, except for inventory gains. Some of them may incur additional losses in 2011 to restore damages on facilities caused by the disaster.

NTT DoCoMo to Enter Natural Power Generation

According to The Asahi Shimbun news, Japan's largest mobile phone service provider, NTT DoCoMo, made it known that it would go into power supply business with renewable sources, DoCoMo President Ryuji Yamada told Asahi's reporter on July 7. Starting next fiscal year the mobile carrier will begin to install solar photovoltaic panels and wind turbines around its relay station towers communicating with individual mobile phones.

The company plans to put the business into place within several years with an eye on eventually selling surplus power to outside buyers. "We are looking at building environmentally friendly relay stations, and we would sell any surplus power," said Mr. Yamada. There have been similar announcements made by mobile phone companies operating their networks, including SoftBank Mobile Corp. which already had publicized a plan to launch solar PV generation projects in collaboration with various local governments.

DoCoMo currently operates about 90,000 relay stations across the nation. Learning lessons from service disruptions caused by the Great East Japan Earthquake and prolonged power outages after the disaster, it started developing "Green Relay Stations" equipped with solar power generators and auxiliary systems. Assisted by the power supply from the grid to make up for fluctuating power generation, the system accumulates any power generated that is over and above its usage into its storage battery to power the station at the times of peak load or outage. It is envisaged to build the system into a smart grid where the supply-demand balancing is optimized with the help of ICT (information and communication technology).

IHI and Two Bio-tech Ventures to Develop Algal Biofuel

The Japanese engineering giant IHI Corporation and two smaller bio-technology ventures announced on July 7 that they would form a joint enterprise for research and development of a biofuel production technology based on utilization of algal growth. To be named "IHI NeoG Algae LLC" and established early August in Kawasaki, the venture will undertake a joint effort in developing a process to mass produce algal biofuel converted from carbon dioxide and sunlight via photosynthesis.

Among the partners to the venture, the gene cloning specialist Gene & Gene Technology in Osaka will offer a special type of Botryococcus (green algae) called the "Enomoto Strain" discovered by Prof. Enomoto of Kobe University as having a proliferation speed that is 1000 times its ordinary variety. It has been confirmed that the algae produces hydrocarbons equivalent to high-quality petroleum based fuel oil at a rate of 50% its dry mass, the highest yield known so far.

Another partner, Neo Morgan Laboratory, Inc. will contribute its patent breeding techniques applicable to various microorganisms based on a unique evolution theory. IHI on its part will provide a wealth of process design and engineering know-how it has accumulated over the years for scaling up and bringing the process into industrial-scale production capacity.

The venture, with a start-up capital of about US$ 3.3 Million, is aiming to obtain a demonstration product within a few years. As the oil production cost with the current algae technology is about 1,000 yen per liter (US$2,000 per barrel), the venture aims to lower it to one tenth to be competitive with mineral oil products, roughly comparable to the nominal crude oil price (US$204 per barrel) projected for 2035 in the IEA World Energy Outlook 2010.

APERC Letter

APERC takes lead role in APEC low carbon model town project

The APEC Low Carbon Model Town Forum was held on June 21 – 23 in Tianjin Binhai, China, the location of the first model town project. Government officials, city develop planners and researchers from various regions and cities of China as well as experts from Japan, Korea, Taiwan, Indonesia, Russia, the United States and others participated in the forum.. APERC is taking a lead role in coordinating the work of the APEC Low Carbon Model Town (LCMT) Project, under the direction of the Agency for Natural Resources and Energy, METI Japan, the overseer of this APEC project.

The LCMT Project responds to the observation that the APEC region is at a critical point in the development of its cities. Both urbanization and economic growth are taking place rapidly, especially in developing APEC economies. Without guidelines, these rapidly growing cities would develop along the energy-intensive and emission-intensive path generally observed among newer cities of APEC's industrialized economies. At the 9th APEC Energy Ministers Meeting (EMM9) held in Fukui, Japan in June 2010, the Ministers observed that "Introduction of low-carbon technologies in city development plans to boost energy efficiency

and reduce fossil energy use is vital to manage rapidly growing energy consumption in urban areas of APEC".

The LCMT Project is designed to encourage creation of low-carbon communities in urban development plans, and the sharing of best practices for making such communities a reality. The project consists of three sets of activities i) development of the concept of the low-carbon town, ii) feasibility studies of specific proposed urban development projects, and iii) policy reviews of selected urban development projects. A panel of experts from the APEC economies ("Expert Group A") is developing the concept of the Low Carbon Town. Another expert group ("Expert Group B") will conduct the policy reviews.

In the 1st phase of the LCMT Project, the Yujiapu Central Business District development project in Tianjin, China was selected as the first project to undergo a feasibility study and policy review. The feasibility study is now being undertaken by Japanese urban design consultant Nikken Sekkei for completion of the report by the end of this year. A policy review by APEC experts is also planned in early September 2011 on rules and regulations for construction of LCMT

The APEC LCMT Project is a multi-year project, and, in addition to Tianjin, other low carbon town and city development projects will be selected for feasibility studies and policy reviews in the years to come.

APERC to publish compendium of energy efficiency policies of APEC economies 2010

APERC is preparing to release 2010 edition of the Compendium of Energy Efficiency Policies of APEC Economies in early August.

Drawing on the collaborative efforts by APEC Energy Working Group members, APEC Expert Group on Energy Efficiency and Conservation (EGEEC) members and governmental energy efficiency experts, APERC's team of researchers have developed this comprehensive report on recent goals, action plans, policies and measures for energy efficiency improvement in twenty APEC economies. The Compendium of Energy Efficiency Policies of APEC Economies is intended to promote information sharing in the field of energy efficiency and energy conservation across the APEC economies under a common format.

The Compendium of Energy Efficiency Policies of APEC Economies will be available on the APERC website (http://www.ieej.or.jp/aperc).

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