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## New Chairman Masakazu Toyoda aims at world top-class think-tank



Effective July 1, 2010, Mr. Masakazu Toyoda assumed the office of the Chairman and CEO of the Institute of Energy Economics, Japan (IEEJ). Prior to this, Mr. Toyoda headed up the Secretariat Office of Strategic Headquarters for Space Policy in the Cabinet, after serving as Vice-Minister of Economy, Trade and Industry during his career at METI. At his inauguration, Mr. Toyoda stated his aspirations as follows.

“I am much honored to have been appointed Chairman and CEO of the Institute of Energy Economics, Japan. I succeed Mr. Masahisa Naitoh who has elected to step down after seven years of invaluable contributions to society as well as to this institute.”

“With huge energy demands coming up in emerging economies, the world is facing threats to stable energy supply and the global environment. The need for accurate information and proactive policy research concerning energy and environmental issues have never been greater. The growing global demand for energy, a vital building block of human activity, requires an accelerated initiative to counter global warming. Upon leading this organization under such circumstances, I would like to convey three of my aspirations as given below.

First, I hope the IEEJ will become a world top-class think-tank in dealing with energy security and climate change issues. Since its inauguration in 1966, the IEEJ has witnessed drastic and complex changes in the world energy situation; gigantic events such as two oil crises in the 1970s and the Gulf War in the 1990s caused a significant rise and fall in energy supply/demand interaction, in particular oil. A new situation then emerged through international negotiation for agreeing to the Kyoto Protocol in 1997, followed by a dramatic emergence of Asian economies that was ignited by Chinese accession to the WTO in 2001.

“Paying close attention to the needs of the times, we have strived to be a specialized think-tank providing clients with value-added analyses on supply/demand interaction of oil

and energy with policy recommendations based on realistic prognosis. In the past five years, with upsurge of world concern about global warming, we have enhanced our analyses on climate change, to be listed as a leading think-tank in Asia. We will enrich our information outreach concerning the energy and the environment, which are now inseparable like the two sides of a coin, aiming to establish an outstanding reputation at home and abroad as a world top-class think-tank.

Secondly, we will deepen our study and analysis on energy and global warming with a view to transforming those threats into causes for breakthroughs leading to development of Japan and the world. It is definitely a great challenge for the world and Japanese economy and industries that we now should deal with energy and the environment as an undividable package. Notwithstanding the enormous difficulty, I trust our attempts will create chances for another great jump. It depends on how we can best transform our actions in coping with global warming into reinforcement of energy supply structure and enhancement of a competitive edge at traditional and new energy industries as well as energy-intensive industries. It is one of our important missions at the IEEJ to elucidate this process.

Finally, we shall strengthen our ability to conduct studies in an objective, neutral and scientific manner. It is now an important political issue in many countries as to how they should address the energy and the environmental crises; not only in Europe and the U.S., but also in Australia, Canada, and emerging countries such as China and India, and of course Japan is no exception. Under the circumstances, we shall keep in mind that the world requires objective, neutral and scientific studies based on facts. At the same time, we should try to integrate micro analyses on industries, technologies and country risks and macro-economic analyses, and formulate them into timely policy recommendations.

Through the above endeavor, we wish to be one of the powerful knowledge groups in Japan sending messages to the world. We believe that the IEEJ shall send out clear messages of positive and practicable policy recommendations to counter threats to energy security and global warming, which will eventually enhance the Japanese presence. I sincerely hope that our endeavor will continue to provide timely insights for policy makers, academia, and business.

On behalf of the entire IEEJ, celebrating its 44th anniversary this year, I would like to express my deepest gratitude to all parties concerned for their kind support extended over these years. I hope the Institute will continue to enjoy your cooperation and support for its future activities."

## **Oil price remains in a boxed range while the Japanese energy demand recovers in 2010**

At the mid-year IEEJ Energy Forum held on July 14, 2010, Dr. Ken Koyama, Director, and Mr. Shigeru Suehiro, Group Leader of the Econometric Data and Modeling Centre, IEEJ, reported outlook on global crude oil prices and Japan's energy trend, respectively, as summarized below. The detail reports in Japanese will soon be available on IEEJ's website.

### **Global Crude Oil Price Outlook**

During the first half of 2010, crude oil price in terms of WTI futures stayed in a boxed trading range of \$68 - 87 per barrel with an average of \$78.5 per barrel. The market will stay at that level during the latter half of 2010 if there is no significant change in market sentiment and expectations. Crude oil prices will generally move in tandem with stock markets, mirroring

the latter's decisions on the world economy and financial climates, the two most significant factors affecting the crude oil prices. The price level will likely follow the IEEJ's Reference Case projection made in December 2009, resulting in the WTI annual average of \$60 - 80 per barrel, with the central rate in the latter half of 2010 being around \$75 per barrel.

A variety of uncertainties including those in the world economy and financial climates are looming over the international petroleum market. Sovereign risks and a disturbed European economy resulting from financial crises in Greece may have significant impacts on the world economy. The Chinese economy, now the world growth center, will also have substantial effects. These factors will transform the macro economy and financial climates with crude oil prices reflecting their changes. On the supply side, OPEC as well as non-OPEC countries are expanding their production capacity gradually. Nevertheless, the oil spill incident in the Gulf of Mexico can be a wild card to chill the market psychology since deep water development is expected to have the largest expansion potential for the world oil supply.

In general, however, crude oil prices are under downward pressures; the WTI may go down to around \$60 per barrel if downside risks fully reveal themselves to put the world economy in turbulence. By contrast, the prices may go up to \$80 - 90 per barrel if negative factors such as the oil spill in the Gulf of Mexico cause concerns on expansion of oil supply capacity while the world economy runs largely stable.

## **Short-term Energy Outlook of Japan**

### **Economic Activities**

Since this spring, the Japanese economy has been recovering from the recession caused by the Lehman shock in September 2008. The Japanese economy is recovering earlier than expected thanks to growing exports to Asian countries whose economies have recovered relatively quickly, as well as to incentive policies to spur domestic consumption. Industrial production also showed a sharp recovery, although it is still hovering around 80% of the production level of 2007 with little sign of growth in capital formation. Incentives such as eco-points system and tax reductions on eco-cars have provided underpinning for the domestic consumption, but their effects are now withering away. The "Child allowances" has ended up being cut to half of the originally announced scale. As a result, domestic demand is yet to firm up and the Japanese economy is still highly dependent on external demand. The real GDP for FY2009 was down 2.0% from the previous year, compared to a 2.7% drop projected last December. The Index of Industrial Production (IIP) in FY2009 was down 8.9% from the previous year, compared to a 10.2% drop estimated the last time.. In summary, the Japanese economy recovered faster than expected in the latter half of the previous fiscal year.

In 2010, export will continue to drive economic recovery in Japan. The IEEJ assumes that production activity will enjoy a healthy recovery driven by exports to emerging economies as well as the world economic recovery, although the latter would be sluggish due to financial troubles in European countries. The IIP in FY2010 is expected to grow by an annual 13.9%, a large step forward from 9.9% estimated last December. The expansion in production will translate into growth in capital investment. Although employment environment is still unstable, it has turned upward, and consumption will eventually go up. Investments in the public sector will see deep cuts swinging back from significant growth last year, personal consumption and export are firm and will drive the real GDP to grow 2.5%, compared to 1.3% estimated last December (with 1.5% of "report padding"). In other words, Japan will see the first positive GDP growth in three years.

## Demand Outlook by Energy Types

In FY2009, electricity sales have shown a sharp recovery with vigorous demand among large users reflecting the rebound in industrial activities. Industrial and other large-sector electricity demand started to grow toward the end of 2009 and now exhibits two-digit growth. Consumption in the residential sector lagged behind and started to grow in 2010. It eventually dropped by 3.4%, compared to a 2.8% drop estimated last December, reflecting weather and other unfavorable factors.

City gas sales have also shown a sharp recovery with vigorous industrial demand reflecting the rebound in industrial activities. Industrial demand started to grow in late 2009 and now shows two-digit growth. Commercial and other demands are also on recovering trends. The residential sector showed significant growth due to colder than expected spring weather. Sales in FY2009 were down 1.9% from the previous year, a slight improvement compared to a 2.2% drop estimated last December.

### Outlook of Japanese Economy and Energy Demand

|  |                                       | FY2007<br>(Actual)       | FY2008 (Actual)          |                           |                           | FY2009 (Actual)          |                          |                          | FY2010<br>(Forecast)     |
|--|---------------------------------------|--------------------------|--------------------------|---------------------------|---------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
|  |                                       |                          | 1st Half                 | 2nd Half                  | Total                     | 1st Half                 | 2nd Half                 | Total                    |                          |
| E<br>c<br>o<br>n<br>o<br>m<br>i<br>c           | GDP<br>(2000 price billion Yen)       | <b>562,344</b><br>(1.8)  | <b>274,020</b><br>(-0.9) | <b>267,321</b><br>(-6.5)  | <b>541,344</b><br>(-3.7)  | <b>259,028</b><br>(-5.5) | <b>271,682</b><br>(1.6)  | <b>530,710</b><br>(-2.0) | <b>543,798</b><br>(2.5)  |
|  | Private Demand                        | <b>417,585</b><br>[0.7]  | <b>203,734</b><br>[-1.8] | <b>201,094</b><br>[-4.3]  | <b>404,828</b><br>[-3.1]  | <b>192,091</b><br>[-5.7] | <b>196,606</b><br>[-2.2] | <b>388,697</b><br>[-4.0] | <b>396,332</b><br>[2.0]  |
|  | Public Demand                         | <b>117,214</b><br>[0.2]  | <b>55,542</b><br>[-1.4]  | <b>60,263</b><br>[-1.0]   | <b>115,805</b><br>[-1.2]  | <b>57,347</b><br>[3.3]   | <b>61,714</b><br>[2.4]   | <b>119,061</b><br>[2.8]  | <b>117,959</b><br>[-0.9] |
|  | Overseas Demand                       | <b>28,068</b><br>[30.2]  | <b>15,076</b><br>[16.8]  | <b>6,132</b><br>[-59.6]   | <b>21,207</b><br>[-24.4]  | <b>8,494</b><br>[-43.7]  | <b>12,000</b><br>[95.7]  | <b>20,494</b><br>[-3.4]  | <b>28,560</b><br>[39.4]  |
| I<br>n<br>d<br>i<br>c<br>a<br>t<br>o<br>r<br>s | Corporate Goods PI<br>(2005=100)      | <b>104.9</b><br>(2.3)    | <b>110.5</b><br>(6.1)    | <b>106.0</b><br>(0.4)     | <b>108.3</b><br>(3.2)     | <b>102.9</b><br>(-6.9)   | <b>102.3</b><br>(-3.5)   | <b>102.6</b><br>(-5.2)   | <b>103.5</b><br>(0.8)    |
|  | CPI<br>(2005=100)                     | <b>100.5</b><br>(0.3)    | <b>102.1</b><br>(1.8)    | <b>101.2</b><br>(0.5)     | <b>101.7</b><br>(1.1)     | <b>100.5</b><br>(-1.6)   | <b>99.6</b><br>(-1.6)    | <b>100.0</b><br>(-1.6)   | <b>99.2</b><br>(-0.9)    |
|  | IIP<br>(2005=100)                     | <b>108.1</b><br>(2.7)    | <b>105.2</b><br>(-0.3)   | <b>83.6</b><br>(-24.4)    | <b>94.4</b><br>(-12.7)    | <b>80.6</b><br>(-23.4)   | <b>91.3</b><br>(9.2)     | <b>86.0</b><br>(-8.9)    | <b>97.8</b><br>(13.9)    |
|  | Crude Steel<br>(1,000t)               | <b>121,511</b><br>(3.2)  | <b>61,508</b><br>(2.9)   | <b>43,993</b><br>(-28.7)  | <b>105,500</b><br>(-13.2) | <b>43,329</b><br>(-29.6) | <b>53,119</b><br>(20.7)  | <b>96,449</b><br>(-8.6)  | <b>110,106</b><br>(14.2) |
| E<br>n<br>e<br>r<br>g<br>y                     | Ethylene<br>(1,000t)                  | <b>7,559</b><br>(-1.3)   | <b>3,472</b><br>(-7.3)   | <b>3,048</b><br>(-20.1)   | <b>6,520</b><br>(-13.7)   | <b>3,514</b><br>(1.2)    | <b>3,704</b><br>(21.5)   | <b>7,219</b><br>(10.7)   | <b>7,181</b><br>(-0.5)   |
|  | Exchange Rate<br>(Yen/\$)             | <b>114.2</b><br>(-2.3)   | <b>106.1</b><br>(-11.1)  | <b>94.9</b><br>(-13.1)    | <b>100.5</b><br>(-12.0)   | <b>95.4</b><br>(-10.0)   | <b>90.2</b><br>(-5.0)    | <b>92.8</b><br>(-7.6)    | <b>90.5</b><br>(-2.5)    |
|  | Crude Oil CIF<br>(\$/Bbl)             | <b>77.9</b><br>(22.4)    | <b>119.8</b><br>(76.5)   | <b>60.0</b><br>(-31.7)    | <b>89.9</b><br>(15.4)     | <b>61.8</b><br>(-48.4)   | <b>76.3</b><br>(27.1)    | <b>69.1</b><br>(-23.2)   | <b>75.0</b><br>(8.6)     |
|  | Electricity<br>(Billion kWh)          | <b>954.7</b><br>(3.5)    | <b>473.2</b><br>(0.1)    | <b>447.6</b><br>(-7.1)    | <b>920.8</b><br>(-3.6)    | <b>436.2</b><br>(-7.8)   | <b>453.2</b><br>(1.2)    | <b>889.4</b><br>(-3.4)   | <b>938.1</b><br>(5.5)    |
| r<br>g<br>y                                    | City Gas<br>(Million m <sup>3</sup> ) | <b>35,896</b><br>(6.3)   | <b>16,713</b><br>(1.1)   | <b>17,793</b><br>(-8.1)   | <b>34,505</b><br>(-3.9)   | <b>15,299</b><br>(-8.5)  | <b>18,539</b><br>(4.2)   | <b>33,837</b><br>(-1.9)  | <b>35,938</b><br>(6.2)   |
|  | Petroleum Products<br>(Thousand KL)   | <b>218,487</b><br>(-2.4) | <b>96,834</b><br>(-4.9)  | <b>104,226</b><br>(-10.6) | <b>201,060</b><br>(-8.0)  | <b>89,875</b><br>(-7.2)  | <b>105,059</b><br>(0.8)  | <b>194,933</b><br>(-3.0) | <b>190,416</b><br>(-2.3) |
|  | LPG<br>(Thousand tons)                | <b>18,659</b><br>(-0.2)  | <b>8,336</b><br>(-5.7)   | <b>8,997</b><br>(-8.4)    | <b>17,333</b><br>(-7.1)   | <b>7,691</b><br>(-7.7)   | <b>8,730</b><br>(-3.0)   | <b>16,421</b><br>(-5.3)  | <b>16,970</b><br>(3.3)   |

Source: Various Japanese statistics. Forecast is made by IEEJ.

Note: 1. Numbers in parenthesis show annual growth rates, while those for GDP show contributions.

2. Sectoral GDP will not necessarily add up to the total.

Petroleum sales remained at a stable level thanks to a recovering economy and decline in crude oil prices since last year. Major supporting factors were the "1000-yen cap on holiday highway toll" encouraging gasoline sales, and recovery in ethylene production driving naphtha sales. However, the industrial sector demand showed no sign of positive growth even with a sharp recovery in production. Overall, petroleum sales in FY2009 were down 3.0% from the

previous year, a slight improvement from a 3.2% drop estimated last December.

In 2010, electricity sales will see healthy growth with large users leading the trend. In particular, export and mechanical industries will produce significant traction. The residential /commercial sector will see demand increase reflecting the economic recovery. Fuel switching to electricity will contribute as well. A slightly hotter summer, if this turns out as forecast, will push up electricity demand for air conditioning further. The overall electricity sales in FY2010 will grow by 5.5% from the previous year, compared to a 4.2% gain estimated last December.

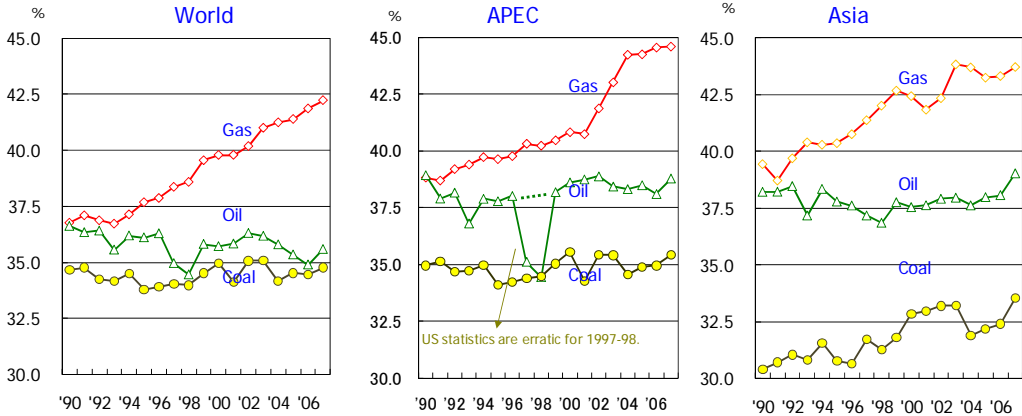
City gas sales will see a significant increase in the industrial sector as well as solid recovery in the commercial and other sectors. Demands for new fuel switching and air conditioning will also come forward. Household gas demand, on the other hand, will not see significant annual growth even after the strong seasonal increase in spring. The overall city gas sales will be up 6.2% annually, compared to a 5.9% increase estimated last December.

In the petroleum sector, fuel switching and improving automobile fuel efficiency will more than offset the expected recovery of industrial production and economic activities, resulting in an overall declining trend. The significant increase in sales of heating kerosene observed this past spring was of a temporary nature, and the coming winter will see a significant decline in demand even if the weather is similar to that of the previous year. Petroleum sales in FY2010 will fall by 2.3% from the previous year, compared to a 2.6% decline estimated last December.

### Change of OECD guidelines is a key to Low-carbon Society

The Japanese government aims at relaxing the OECD guidelines on export credits for high-efficiency thermal power plants that will contribute to reducing GHG emissions significantly. Under the present rules, the maximum repayment term of loans for fossil-fuel thermal plants is 12 years. If this is extended to 18 years, the level equivalent to renewable energy projects, says a METI official, high efficiency plants can penetrate the market much faster. It is well known that a longer term credit will substantially lower the threshold for energy infrastructure investments. The United States is said to be against this proposition on grounds that it will encourage construction of coal thermal plants leading to increased GHG emissions.

Figure 1 Efficiency of Thermal Power Generation



Source: IEA Energy Balances of OECD/non-OECD countries 2009 version

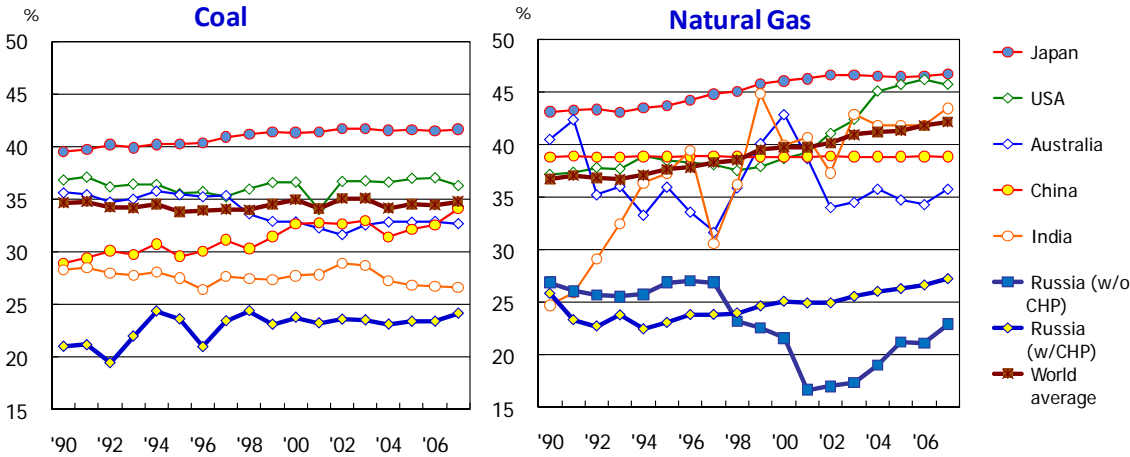
Efficiency of thermal power generation, in particular with gas turbine combined-cycle (GTCC) technology has advanced markedly in recent years, while that of coal-fired thermal and



oil-fired thermal remained stagnant.<sup>1</sup> For oil-thermal stations, this is because construction of new oil-thermal stations was banned in the OECD countries after the oil crises of the 1970s; old and non-efficient oil-thermal plants are being phasing out. Efficiency of coal thermal stations has remained almost flat except for Asia where plants are relatively smaller in size. In general, a severer degree of exhaust gas treatment requires more power consumption within plant premises. On the other hand, Asian coal-thermal plants are generally smaller in size and therefore inefficient.

While Japan has achieved the world’s highest thermal efficiency for both gas- and coal-fired power generation, many low-efficiency plants are in operation worldwide. This is typically the case for emerging economies. For coal-thermal power, Japan achieved an average 41.6% efficiency in 2007, while India recorded a mere 26.6%. For gas-thermal power, Japan achieved 46.8%, compared with Russia’s 27.3 % even with combined heat and power (CHP) plants.

Figure 2 Efficiency of Thermal Power Generation by Country



Source: IEA (Energy balances of OECD/Non-OECD countries – 2009)

Raising efficiency of the existing plants to the level equivalent to the average for Japan will enable these countries to save fuel for power generation by 15% up to 60 %. Moreover, the latest plant using the most advanced combined cycle (MACC) gas thermal power, which started operation this year in Japan (No.1 Unit of Kawasaki Power Station), has achieved a thermal efficiency reaching 58.6% with an exhaust gas temperature of 1,500 degree C. The company is aiming at 61% for the No.2 unit with an exhaust gas temperature of 1,600 degree C, to go on-line in 2016.<sup>2</sup> Also, the latest of advanced ultra-super-critical (A-USC) coal thermal plants in Japan, the No.2 unit at Isogo Power Station, Yokohama, has achieved 43% after deducting its own use.

If the current best efficiency for coal-thermal plants realized in Japan (43%) were achieved worldwide, 1.4 giga tons (Gt) of CO<sub>2</sub> emissions could be reduced annually. Demand for coal would also be reduced substantially. Of the above CO<sub>2</sub> reduction, 1.1 Gt or 80% could be achieved by three countries alone, namely, the United States, China and India.

<sup>1</sup> This analysis is the gist of the report by K. Kanekiyo, Research Advisor of IEEJ, presented at the 39th meeting of the APEC Energy Working Group held in Tokyo in March 2010 as “Outlook for Sustainable Fossil Energy development in APEC”.

<sup>2</sup> Tokyo Electric Power Co., Ltd. (Tepco), “Improvement of Heat Efficiency at Thermal Power Plants”, Tepco website, updated June 24, 2010.

Since a thermal power plant continues operation for 40 years after construction, Japan aims to prepare conditions where developing countries can afford to adopt the best available technologies. Otherwise, less efficient plants will continue to be built and operate generating more GHGs for a long time, since developing countries need more power supplies under any condition.

## Energy Committee Highlights

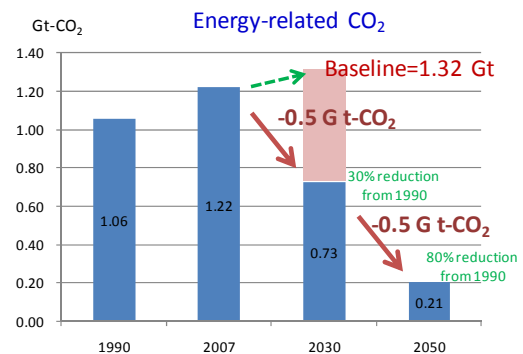
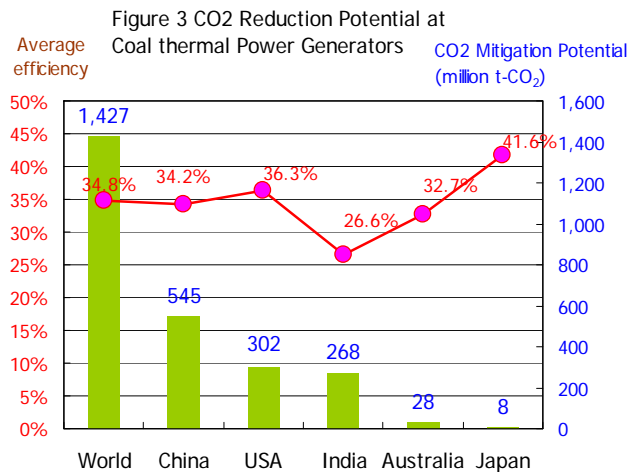
### Cabinet approves revised Basic Energy Plan

At a subcommittee meeting of the Advisory Committee for Natural Resources and Energy held on June 8, deliberations were made on the draft of the revised Basic Energy Plan. After final touch up, the draft was approved by the Cabinet on June 18th. The newly revised Basic Energy Plan has set numerical targets for raising energy independence ratio from the current 38% to around 70% by 2030, as well as raising the zero-emission power source ratio from the present 34% to 70%. In addition, a new target was added at the time of cabinet approval to cut energy-related CO<sub>2</sub> emissions by around 30% from 1990 levels by 2030. This amounts to a 40% reduction from the 2007 level of 1.22 billion tons. Suppose the target for 2050 is set at an 80% cut from the 1990 level, about half will have been realized by 2030. In addition, CO<sub>2</sub> emissions per GDP, or CO<sub>2</sub> intensity, are set to be 1.0 ton per real GDP of one million yen in 2030, which will be less than half the figure of 2.2 tons for 2007.

According to the calculation by the Secretariat, in the business-as usual (BAU) case, CO<sub>2</sub> emissions in 2030 are projected to total 1.32 billion tons. Under the revised Basic Plan, a target of reducing 600 million-tons of CO<sub>2</sub> per year from the baseline projection is set based on the premise that a variety of measures (as described in the previous issue of the JEB) will be fully pushed forward.

At the discussion table of the Advisory Committee, members expressed various views on the challenging nature of the presented targets as well as on conditions and policy requirements to achieve the goals. Some of the noteworthy views expressed were as follows:

- The new Plan is totally revised from earlier plans stipulating an energy-based growth strategy. To achieve the goal, however, various specific and dedicated measures need to be formulated and implemented. In addition, since regulations are being tightened to such an extent, it is questionable whether industry would agree to go along with the Plan.
- It is an extremely bold challenge to aim at the reduction targets with domestic measures alone, which would surely affect people's lifestyles. A cost/benefit analysis, effective prescriptions, and how individuals will be expected to share the burden must be explained to the public to seek for their understanding.
- Ensuring that the economy and low carbon emissions go hand in hand requires new technological innovation in many different fields. Each policy must be designed in a way



leading to further innovations, and so that corporate efforts and investments in technology will eventually yield an asset. It is also essential to ensure that adequate industrial competitiveness is established, while short-sighted pursuit of massive introduction of photovoltaics would merely lead to an increase in imports.

- Improving energy independence could lower the risk in resource imports while raising risks in overseas investment. Amidst fierce competition worldwide over resources, the government must take the initiative in addressing investment risks. In addition, we should note that declining fossil fuel import would lower the buying power of Japan.
- While nuclear power is emphasized with an ambitious goal, it is necessary to prepare relevant institutions, systems and well-defined procedures. When developing fast-breeder reactors and overseas nuclear projects, securing human resources is one of the great challenges. Thus, the government must take the lead in improving the overseas investment climate.

Since the new Basic Energy Plan has hammered out the direction of tightening government regulations in achieving the targets, industry is showing an increasingly cautious stance. Notably, the revised plan states a policy that application of the law “Sophisticated Methods of Energy Supply Structures”<sup>3</sup> could be considered if necessary. Under the Act, if the status of effective use of fossil energy or promotion of low-carbon energy sources is deemed as significantly inadequate, the government can advise that necessary measures should be taken. Such policy measures are likely to be invoked relating to construction or expansion of nuclear power plants, improvements in their utilization, upgrading of oil refineries, and advanced introduction of renewable energies in the areas of power, oil and city gas.

Meanwhile, the Bill of the Basic Act on Global Warming Countermeasures to set forth the mid-term target for cutting greenhouse gas emissions by 25% from 1990 levels by 2020, which was the crown jewel policy of the former Hatoyama Administration, has been left unfinished and aborted during the previous ordinary Diet session. Sakihito Ozawa, Minister of the Environment who positioned this bill to symbolize a shift in the government’s environmental policy after the change in government, indicated submitting the Basic Bill with the same content to the Diet after the Upper House election. However, due to the crushing defeat of the Democratic Party of Japan (DPJ) at the Upper House election held on July 11, 2010, these ideas are now in jeopardy. The business community has been in strong opposition to the bill stating that a reduction target tougher than that of other countries could undermine Japan’s international competitiveness.

## **Promotion of renewable thermal energy is another challenge**

The 2010 revision of the Basic Energy Plan stipulates that, toward the goal of “raising the share of renewable energies to 10% of the primary energy supply by 2020”, Japan should expand the scope of thermal use of solar and biomass energies while accelerating introduction of a thermal version of tradable renewable certificates, known as Green Heat Certificates. As such, METI intends to set up a “Renewable Thermal Energy Utilization Committee”, as early as July, to investigate methods of promoting thermal uses of renewable energy. Mr. Junichi Ogasawara, Senior Researcher of the IEEJ, analyzes issues in this new challenge as follows.

In the history of renewable thermal energy in Japan, the oil crises of the 1970s led to extensive sales of solar water heaters. However, the subsequent slump in oil prices stalled further

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<sup>3</sup> Official Title: “Act on the Promotion of the Use of Nonfossil Energy Sources and Effective Use of Fossil Energy Materials by Energy Suppliers”



popularization as their application was mostly limited to home use; large-scale district heating projects were not yet widely developed in Japan. In recent years, use of renewable energies for power generation is rapidly expanding thanks to a number of promotional measures such as power purchases by electric power utilities through the Renewables Portfolio Standard (RPS) mandate, subsidies of national and local governments for photovoltaic systems, and programs to buy back excess solar power. Discussions are under way to expand the scope of the feed-in tariff (FIT) system to all types of renewable energies, while a definitive policy is being formed only for electricity. Studies to establish a specific program for the use of renewable thermal energy is not making significant progress, even though the subject has received greater attention from various stakeholders.

Renewable thermal energy includes solar heat, biomass heat, snow and ice, geothermal energy (including use of constant temperature in the shallow zone), and air-sourced heat pumps. Waste heat from fuel cells, factories, and waste incineration plants also fall under this category. The energy will be used in a variety of forms such as hot water, cold water, steam, hot air, and cold air. The quantities of heat produced by renewable energies can be precisely determined based on the flow rates and differences between the inlet and outlet temperatures for hot water, and applying flow rates, temperatures, and pressures for steam, for example. However, there is no proven measuring system for hot or cold air, despite their temperatures and flow rates being measured. Generally in thermal energy applications, supply conditions such as temperature or pressure at a time are mainly checked as data for tuning the operation of a plant or a facility up to an appropriate level, while measurement and collection of accumulated heat values as volume data that would enable regional heat use are often left incomplete.

Greater use of renewable thermal energy could be promoted by measures such as subsidies for new installations as well as obligatory reviews on the introduction of a renewable thermal energy conversion system as a mandate in the Green Building Programs of Tokyo and Yokohama. Promotional measures proportionate to the amount of heat used may include setting out heat purchase programs by energy companies, Green Heat Certificates, and domestic CO<sub>2</sub> credits and/or offset credits systems. The heat purchase programs by energy companies are regarded as mid- to long-term initiatives as they require development of infrastructure that enables authorized measurement of the heat purchased as accumulated volume, overcoming the current situation where most systems are installed individually by the owners of plants or facilities for their own use of heat.

The Green Heat Certificates are devices to transfer publicity and other added values based on the amount of the utilized renewable thermal energy from facility owners to certificate purchasers. At present, scope of applying Green Heat Certificates is quite limited due to lack of precise and reliable “heat value measurement system” required for the intended transactions. A comprehensive strategy should be established to develop use of renewable thermal energy applying multiple promotional programs and supporting measures.

## **Emission trading in Japan is controversial**

On June 10, the Global Environment Subcommittee of METI<sup>4</sup> held the first meeting of the Policy Working Group, chaired by Jitsuro Terashima, Chairman of the Japan Research Institute,

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<sup>4</sup> A subcommittee of the Environment Committee under the Industrial Structure Council, an advisory council to the Minister of Economy, Trade and Industry.

Limited (JRI), to deliberate on introduction of emissions trading. After briefing by the secretariat on the status of counter-global warming policy in Japan and outline of the design and legal grounds for emissions trading, it was also reported that discussions on similar laws and regulations have yet to make progress in the U.S., Australia and New Zealand.

Discussions at the committee centered on the issues relating to structuring emissions trading. Participants voiced generally cautious opinions in approaching the issue as follows;

- The essential task is to secure employment, develop industries and sustain economic growth. It is difficult to deal with global warming in the midst of unresolved economic anxieties. Policies for industrial development should be discussed simultaneously.
- The EU-ETS does not look very successful. We hear such notes that emissions trading could trigger another subprime crisis, or that a tax scheme should be considered instead. We should discuss whether it is advisable for Japan to introduce emissions trading, carefully investigating disadvantages experienced in the European Union in introducing the EU-ETS.
- Emissions trading is not the sole solution for mitigating CO<sub>2</sub> emissions. It should be considered in the context of the entire policy framework, and therefore it is important that the global warming tax also be addressed in the discussion.
- If a short-term target of emissions reduction is pursued introducing emission trading, this would be eating away the funds required for long-term investments. Violent fluctuations of carbon prices would also complicate investment decisions as well.

Chairman Terashima summarized the discussion saying, "It is important to discuss the matter without precondition of introducing emissions trading and in the context of the whole policy mix."

At its second meeting held on June 24, views and opinions were raised as follows:

- Political thoughts have changed drastically in the past two years. Against this backdrop, the Industrial Structure Vision 2010<sup>5</sup> states that we should no longer rely entirely on the market mechanism but the government should assume a greater role, which should be the starting point of future in-depth discussions.
- It is feared that emissions trading would deplete funds for mid/long-term investments required for technical innovation. While Japanese utilities are forced to purchase a significant amount of credits under the Kyoto Protocol, its effects will be short-lived, not lasting to the future, and simply allowing outflow of the national wealth.
- Policies assuming that market mechanisms will work effectively guided by invisible hands are not practicable and would entail issues of grandfathering on allocation of emission permits. It is dangerous to place emissions trading as the core policy of countering global warming.
- Setting a cap on the energy transformation sector will implicitly impose a burden on end-users. This issue must be resolved at the same time.

Given that there are a number of skeptical views questioning effective implementation or significance of emissions trading in various countries, the working group has decided to send a mission to Europe and the U.S. in July. Discussions will be continued based on the findings of the mission team.

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<sup>5</sup> The Industrial Structure Vision 2010 was endorsed by the Japanese Cabinet in June 2010 as the core policy to revive the Japanese economy, building a new industrial structure that connects potential strengths to business.

## Energy News in Japan & Asia

### Imports of Russian crude oil are increasing fast

Japan's crude oil imports from eastern Russia are increasing fast. Major grades are Vityaz from Sakhalin-2, Sokol from Sakhalin-1 and the Siberian Blend transported via the ESPO (Eastern Siberia Pacific Ocean) pipeline. In recent years, Nakhodka Blend, a mixture of topped residues of east Siberian crude oils railed to the coastal refinery, has gained a certain share.

Since crude oil export via the ESPO pipeline started only in 2009, it barely appears as a slight mark in the graph (right). However, it has been running at a pace of one million tons per month during the first five months of 2010, and will significantly push up Russian crude export to Asia in 2010. Destinations of the ESPO crude exports during the said period was roughly 40% for Korea, 20% for Japan, 14% for the US and 11% for China.

A branch line of the ESPO pipeline connecting to the northeastern provinces of China is scheduled to be completed in 2010. This will significantly raise the Russian crude oil imports to China. Coastal provinces of China will also benefit from the marine exports of Russian crude oils from Kozmino, DeKastri and Prigorodnoye.

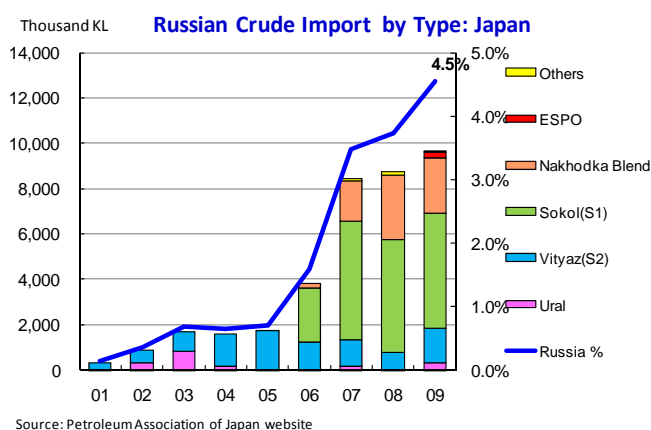
Once the under construction section of the ESPO pipeline between Skovorodino and Kozmino is completed, the pipeline will bring a maximum of 50 million tons per year of Siberian crude oils setting aside 30 million tons branched to China from Skovorodino. By that time, Russia will be exporting 100 million tons per year or 2 million barrels per day (bpd) of crude oil from its eastern provinces, while the total crude oil import of Northeast Asia was 584 million tons in 2009. This will not only help accommodate China's mushrooming oil import, but also exert a substantial impact on the crude oil market in Northeast Asia.

### JX Energy consolidates operating companies

JX Holdings, Inc inaugurated in April 2010 after the merger of Nippon Oil Corporation and Nippon Mining Holdings, Inc (its energy arm known as Japan Energy Corporation) created three main operating companies effective July 1, 2010; JX Nippon Oil and Energy Corporation, JX Nippon Oil and Gas Exploration Corporation and JX Nippon Mining and Metals Corporation.

JX Energy has taken over the marketing and refining sectors of Nippon Oil and Japan Energy, bringing its marketing share in Japan to as high as 35%. Its turnaround for 2010 is estimated to be 7.8 trillion yen (or 85 billion US dollars). Its marketing brand will be consolidated to "ENEOS", the former logo of Nippon Oil while Japan Energy's "JOMO" brand will disappear.

Facing the severe demand shrinkage, JX Energy plans to drastically reduce its refining capacity. From 1,792 thousand barrels-per-day (bpd) of capacity at the end of 2008, it will slash 400,000 bpd by March 2011 and a further 200,000 bpd by March 2014. The company aims to be a most competitive oil company by further reducing operating costs to the tune of 80 billion yen per year as the synergy effect of the merger such as consolidating procurement and transportation facilities. In other areas, it plans to consolidate LPG marketing arms, expand domestic LNG business and develop new energy businesses such as PV, fuel cells and batteries.



### APEC Energy Ministers Show Strong Support for APERC Activities

The APEC Energy Ministers showed strong support for APERC activities at their ninth meeting on 19 June 2010 in Fukui, Japan. The meeting focused on the theme “Low Carbon Paths to Energy Security”, and was divided into sessions on energy security, energy efficiency, and low-carbon energies. APERC President Kenji Kobayashi was invited to address the energy efficiency session. In their discussions, the ministers or representatives from nine APEC economies specifically cited the Peer Review of Energy Efficiency (PREE) and/or the Cooperative Energy Efficiency Design for Sustainability (CEEDS) as successful examples of APEC cooperation for improved energy efficiency. Both activities are coordinated by APERC.



Prior to the meeting APERC had also completed an analysis of the aspirational goal established by APEC leaders in their 2007 Sydney Declaration to reduce APEC’s energy intensity (energy use per dollar of GDP) by 25% between 2005 and 2030. The analysis concluded that, partly due to the purposeful actions of the APEC economies in improving energy efficiency, there is strong evidence that this goal will be exceeded by a wide margin. The finding was well-received by the ministers, with several calling for APEC to revise the goal upward, perhaps to as much as 50%. In their final Fukui Declaration, the Ministers instructed APEC’s Energy Working Group (EWG) “to intensify analysis of the potential for further energy intensity improvement with a view to recommending an enhanced goal”. APERC’s report will be released in August on the APERC website <http://www.ieej.or.jp/aperc/> under the title *Pathways to Energy Sustainability: Measuring APEC Progress in Promoting Economic Growth, Energy Security, and Environmental Protection*.

In addition to continuing work on PREE and CEEDS, and assisting with the assessment of the energy intensity goal, the Fukui Declaration also specifically requests APERC’s assistance

- with follow-up activities to PREE and CEEDS, including capacity building, policy research support, and processes to gauge the success of member economies’ efforts to implement the recommendations of these programs; and
- with exploring mechanisms to encourage economies to set individual goals and action plans for introducing low-emission power sources. ; and
- with an unconventional gas census to evaluate the potential of unconventional resources and to recommend cooperative actions which could increase natural gas output, boost natural gas trade and use, and moderate natural gas prices

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