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Going Energy Efficient

Japanese strivings and efforts

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Summary

This PM deals with government measures to obtain improved energy efficiency. Japan resembles Sweden in the sense that the heavy industries have been important for the economy, and both countries have for a long time worked seriously to obtain a resource efficient use of energy. The aim of the PM is to provide an input to the further Swedish work to obtain energy efficiency.

In three decades Japan has improved energy efficiency with about 36 percent. The New Energy Strategy launched in 2006 sets the target to improve the efficiency with at least another 30 percent. Energy security was once the key driving factor but today, the climate issue is growing in importance.

The improvements so far are due to government measures as well as industrial efforts. The government has supported the development through a regulatory framework that provides guidelines and sets standards as well as by promoting R&D. The industry has achieved improved energy efficiency by optimizing their energy use, developing innovative technologies and by voluntary action plans.

Still, Japan has a serious problem in fulfilling their commitment within the Kyoto Protocol. The government finds that improving energy efficiency can contribute substantially to reductions of carbon dioxide emissions in the short term. In order to achieve further improvements the government tries to involve everybody. Therefore Japan wants to increase the general awareness level, for example through extensive use of labels and national campaigns. This also means extended sector coverage when it comes to the regulatory framework. It also means that the government is demanding more and more not only from industry but the entire society. Japanese environmental policy has always been technology driven; the policy has been based on agreements between industry and government and the focus has been to make business out of R&D. Technology has thus been the key to the development and still is. An important element in the Japanese policy is the recognition of the need for new business models, for the domestic market as well as for exports.

1 Realizing Energy Efficiency

Japan is poor in natural resources easily used for fuel production and is therefore to a great extent dependent on imports. During the 1960s Japan experienced high economic growth. The Japanese industry was mainly heavy industry; e.g. steel production and petrochemicals. The consumption of goods also increased substantially as income per capita grew rapidly. When the world encountered the first oil crises in 1973, petroleum was more crucial than ever before to the Japanese economy. The imported petroleum accounted for more than three fourths of the demand for fuels (Ministry of Environment, 2007 a). Hence, Japan was hit hard.

Facing turmoil, Japan implemented various counter measures on the supply side as well as on the demand side. Energy conservation measures were an important part of these measures. As a result of government measures but also of industrial efforts and structural changes of the economy, Japan's energy per GDP peaked in 1973 and then decreased substantially. In 2004 it was about 66 percent of the 1973 level. However, energy consumption per capita continued to increase until the mid 90s. In the 80s the energy intensity reduction slowed down, reflecting lowered energy prices. (The Institute of Energy Economics, Japan, 2006)

As Japan has already become the most energy efficient economy per GDP in the world, it is often argued that further improvements will cost more than reductions elsewhere. However, it is also argued that energy efficiency is good for business and leads to growth. Japan has the goal to improve energy efficiency with at least 30 percent by 2030, to be compared with the EU goal to reduce the use of energy with 20 percent by 2020.

The Swedish government announced in September 2007 that 420 million SEK will be used for energy efficiency purposes in 2008-12. At the same time they stated that the goal set by EU meant an increase in ambition and that Swedish efforts so far are not enough (Ministry of Industry, Employment and Communication, 2007). In Japan, the total budget for energy efficiency and conservation measures are fiscal year 2007 about 134 billion Yen (about 7.9 billion SEK, SEK=16.9 YEN Dec 2007), but that includes renewable energy as well (Energy Conservation Center, 05 Dec 2007, 11 Dec 2007). Even though the figures are not comparable they are interesting to relate to GDP; in 2006 the Japanese GDP amounted to about 4.340 billion USD, the corresponding figure for Sweden was about 385 billion USD. (World bank, 2007)

2 Creating Business out of Energy Efficiency

The Japanese government's standpoint is that energy efficiency measures help to secure energy supply as well as mitigate global warming. The experience so far is also that the measures lead to economic revitalization by stimulating investments and development of energy efficient equipment as well as new industries. (Ministry of Environment, 2007 a) This standpoint is of course not unique for the Japanese government. However, to seek business opportunities while "going green" has always been characteristic of Japanese government measures within the environmental field.

The Swedish government has an ambition similar to the Japanese. In the budget statement for 2008 it is declared: *The Government is working consciously to combine environmental and enterprise policy. Both to enhance Sweden's competitiveness and contribute to new jobs and also because export successes increase the benefits of Swedish environmental technology many times over.* (Ministry of Finance, 2007)

2.1 Policy System for Energy Efficiency – Key Features

The policy on energy efficiency (or rather conservation; to keep from being lost, damaged or wasted and thereby saved, as energy efficiency in Japan is dealt with in that context) is on a sector by sector basis. It is said to have contributed to competitiveness in the market, improved technology and the development of innovative technologies. It is also said that the Japanese government has taken advantage of the business vitality within the private sector and its initiatives, by working in close cooperation with private firms. (The Institute of Energy Economics, Japan, June 18 2007; Ministry of Environment, 2007 a)

2.2 Regulations and Other Measures

2.2.1 The Moonlight Project

The Moonlight project starting in 1978 was the first measure to be launched. The aim was to develop more effective use of energy resources by developing and improving energy conversion technologies, recovery and efficient use technologies. The government promoted large-scale, innovative and fundamental R&D for energy conservation. It also subsidized similar R&D efforts made by the private sector. The New Energy and Industrial Technology Development Organization and related organizations were in charge of the work. The Moonlight project is perceived as a success and is considered to have contributed to major achievements in the industrial sector. Manufacturers made dramatic improvements in their energy efficiency. (Japan for Sustainability, Sep 28 2007; The Institute of Energy Economics, Japan, 2006)

2.2.2 The Energy Conservation Law

In 1979 a law to promote rational use of energy was enforced; the so called *Energy Conservation Law*. The law has been revised several times. In 1979 it provided guidelines for energy conservation at large factories as well as supportive measures. In 1993 an amendment obligated designated large factories to nominate energy managers and to keep and report an energy consumption record. In 1999 an amendment incorporated the outcome of a COP-3 meeting as well as the Kyoto protocol. The major new contents were:

The Top Runner Program, energy conservation plans for large companies, medium sized companies to nominate energy managers to report energy consumption records. In 2003 the amendments said to incorporate energy management at large office buildings and energy conservation at medium size non-residential buildings. In 2005, the amendments incorporated energy conservation in large or medium sized factories, transportation business and building construction sectors. In 2006 a legally binding system was incorporated in the law under which large emitters report their GHG emissions to the government who makes the numbers public. (The Institute of Energy Economics, Japan, 2006; Ministry of Environment, 2007 b)

As seen above; in an early stage the law concentrated on controlling the energy consumption of large industries, by giving guidelines and obligating report of energy consumption records. Today the law includes also medium size factories, resulting in about 13 000 factories being affected, as well as transportation businesses and buildings that are large or medium size energy consumers. The Ministry of Economics, Trade and Industry set the guidelines (The Institute of Energy Economics, Japan, 2006).

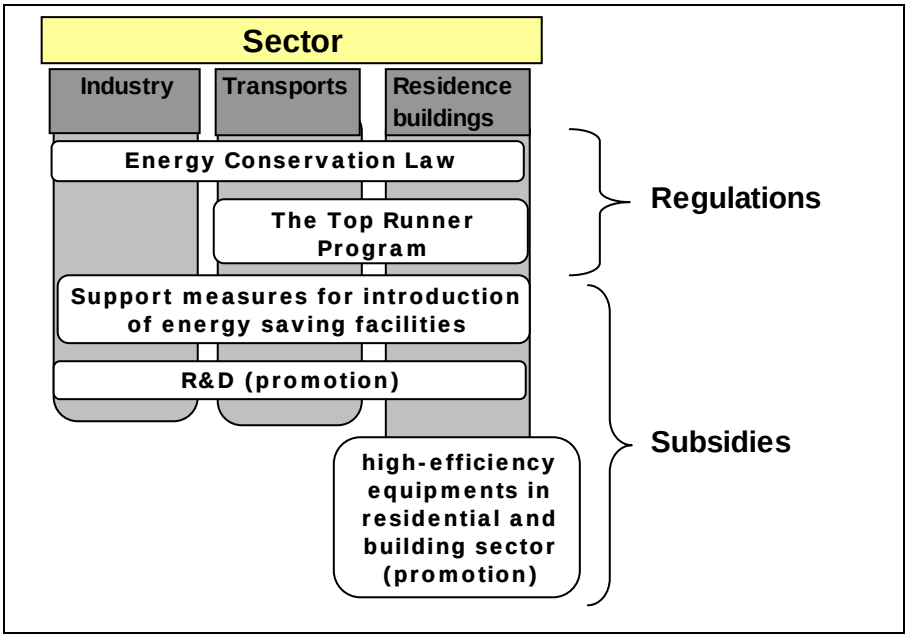
The Top Runner Program was introduced to set forth target standards of energy efficiency for a designated year. It currently covers 18 items including motor vehicles and home/office appliances. Manufacturers are requested to improve the energy efficiency of their products to the level of the product in top of a chosen base year. This is to promote voluntary competition even though a manufacturer will eventually have to pay a fine if not reaching the target standard. Apart from the target standard and the commendation system, the program includes labeling systems. Top Runner is considered to have been an important measure in enhancing energy efficiency as it has been encouraging manufacturers to reach specific targets or to do even better. The targets have however been criticized for being to easily achieved. In *Tillväxtpolitisk utblick* nr 7 2005 the program is described on a more detailed level. It is also concluded that the Top Runner Program is an enhancement of the goal oriented approach including targets that are specific and possible to evaluate. (Japan for Sustainability, Sep 28 2007; The Swedish Institute for Growth Policy Studies, 2005 a)

The Top Runner Program also includes automotives. The fuel efficiency of new-car models have been improved (from 12.3 km/l to 15 km/l) and this is said to be mainly due to standards based on the top runner program. An eco-drive campaign is expected to reduce the fuel consumption by another 25 percent. (Energy Efficiency and Conservation Division, 2006)

In 2006, measures to encourage carriers and shippers to make energy-saving efforts were amended in the Energy Conservation Law. From 2007 it has been obligatory for carriers and shippers larger than a certain size to prepare and submit periodical reports and plans. (Energy Efficiency and Conservation Division, 2006)

Summary of Governmental Measures

The measures described above can be summarized as below.



The government has thus established guidelines, set standards and decided on product labeling. Apart from that the government supports R&D.

2.2.3 Voluntary Actions

Business owners and managers are recognized for having aggressively promoted the introduction of energy saving technologies, starting after the first oil crisis. Ministry of Environment points out that the industries continued to do so even after the crude oil prices stabilized and Japanese industry regained stable economic growth (Ministry of Environment, 2007). However; it is clear that high prices were essential as the process of improving energy efficiency slowed down in the middle of the 80s (The Institute of Energy Economics, Japan, 2006).

The Japan Business Association Nippon Keidanren has played a major role when it comes to industrial efforts to improve energy efficiency. Keidanren issued in 1997 a call to the Japanese business community to organize *Keidanren Voluntary Action Plan on the Environment*. In response to this call, 36 industries and 137 industrial organizations (from manufacturing and energy to distribution, transportation, finance, construction, and foreign trade) cooperated in drafting plans. The Keidanren action plan has the goal to reduce CO2 emissions from designated activities in 2010 to below 1990 levels, however the goals differs between different businesses (The Institute of Energy Economics, Japan, 2006). Many industries have primarily chosen to emphasize improvements in the efficiency of energy use, in terms of level of energy input per unit of output. The measures include innovations relating to operational control; including offices, equipment and processes, but also investments in R&D. (The International Copper Association)

The Keidanren action plan is considered the most important action plan and a key driver for the development. Even if the Keidanren action plan includes also non-member industries, there are other voluntary action plans that include e.g. the automotive industry. Together the business circles has committed to a 6 percent reduction compared to 1990 levels, to be accomplished before 2012. These action plans cover approximately 80 percent of the industrial and energy conversion sectors. The action plan is subject to annual review and the results reported. But the system has been criticized as it largely consists of self-review without guidelines. It has also been expressed that the action plan was a strategy to pre-empt government action in strengthening energy efficiency policy. (Oshitani, 2006; American Embassy Oct 2007, Yomiuri Shimbun, 29 Oct 2007, Ministry of Environment, 2007)

Japanese industry also recognizes that environmental issues have to be tackled and that energy efficiency is good for business. Keidanren declared already in 1991 that: *grappling with environmental problems is essential to corporate existence and activities*. The Japan Copper Development Association is one of many organizations that have recognized energy efficiency as a business strategy. They state that: *Investing in electrical energy efficiency is a **low-risk, high-payback strategy** to promote economic growth and competitiveness*. They compare energy inefficiency with a tax collected but never deployed to benefit anyone. About the investments needed the copper association recognizes that it is quickly repaid due to lower costs. High energy costs in Japan compared to the US and Europe, due to various taxes and distribution costs, is describe as beneficial from the point of view that even a small percentage improvement in energy efficiency nationwide can free a substantial amount of resources to be used in more productive ways. For the individual company the benefit might be a higher shareholder value. They also point out that energy efficiency can retain or create jobs as the money saved can be used for labour instead. (Japan Copper Development Association)

2.3 Results

As mentioned earlier, the first oil crises in 1973 triggered the development of energy efficient processes, products and technology in Japan. The uncertainty of the future made the government as well as the industry very active. Economy and energy security was the driver, which is also confirmed by the fact that the process of improving energy efficiency slowed down in the middle of the 80s (The Institute of Energy Economics, Japan, 2006). However, the security issue is not solved; Japan is still highly dependant on imports. Climate concern has become another issue and the efforts therefore continue.

Energy intensive industry could not continue being the main engine in the Japanese economy, when facing substantial energy price hike. Instead service industries as well as non-energy intensive manufacturing industries, producing light and thin products with high-tech content, became the main engine. While the production value of energy intensive industries has remained at about the same level as in 1973, the size of non energy intensive industries has four-folded and the size of the service sector three-folded. (The Institute of Energy Economics, Japan, 2006)

Emissions caused by the industrial sector have declined, due to improvements in energy efficiency but even more so due to a decline of the energy intensive industry. Ministry of Environment however acknowledges that the energy efficiency efforts have resulted in advanced technologies that they expect will be exported to other countries. (Ministry of Environment, 2007 a; The Institute of Energy Economics, Japan, 2006)

CO2 emissions from the transportation sector and the commercial and residential sectors have however increased substantially from the base year 1990 (in percentage 18.1, 44.6, 36.7). Collectively these sectors accounted for 57 percent of all CO2 emissions in 2005. Ministry of Environment points out that this means that there is a large reduction potential from these sectors. (Ministry of Environment, 2007 a)

The increase in the commercial and residential sector is mainly due to the widespread use of electronic office equipment, computers and large-size home electronics. (American Embassy, Oct 2007)

3 Current Efforts

As mentioned above, the measures already carried out have proven to not be enough. Dependency on imported fossil energy is still high and more has to be done in order for Japan to reach its Kyoto commitment. This section describes some of the additional measures that are currently being implemented.

3.1 Energy Conservation Frontrunner Plan

The Energy Conservation Frontrunner Plan is one out of four plans in the *New National Energy Strategy* (with energy security at its core) that was released in May 2006. The target is at least 30 percents improvement in energy efficiency by 2030. The measures will be: *Establishment of a positive cycle of technological innovation and the development of a social system that encourages this through the formulation of a technology strategy that supports future energy conservation; development of top-runner type standards for identifying excellent energy conservation technology; enhancement of assistance to top-runners; and investigation of mid- to long-term energy-conservation social systems.* (Agency for Natural Resources and Energy, 2006)

3.2 Measures

3.2.1 Information

Labeling systems

There are several kinds of marks and labels in order for people to be able to easily identify energy-saving products. Labels are considered to be effective in this aspect. For example there is the label showing fuel economy for motor vehicles, certifying that the product satisfies the target standards under the Top Runner Program and the label under the *Energy-Efficient Product Retailer Assessment* system that evaluates the sales effort of retailers. There are also price-awarding competitions arranged by the Energy Conservation Center. (Ministry of Environment, 2007; Japan for Sustainability, Sep 28 2007)

Energy Conservation Promotion throughout the Year

The Japanese government has declared the first of every month as "Energy Conservation Day", February as "Energy Conservation Month" and the first day of August and December every year as "General Check-up Day for Energy Conservation", in order to promote energy conservation efforts across the nation and throughout the year. For example there are seminars and exhibitions held. The ENEX Exhibition is one of the biggest. It is held in Tokyo and Osaka every February and organized by the Energy Conservation Center with the support of Ministry of Economy, Trade and Industry. It features various kinds of energy conservation measures and new energy technologies to provide the public with a broad range of information concerning energy-saving subjects across all sectors. (United Nations ESCAP, 1999; Energy Conservation Center, 16 Nov 2007)

National Campaigns

As energy-technologies are of no use if they are not widely spread, the government has initiated several national information campaigns. Grassroots activities are to improve people's activities and change their lifestyles. (Ministry of Environment, 2007 a) This is also

interesting from the point of view that Japan grassroots activities are not common in Japan and the NGO's are few. (Wong, 2001)

The national Team Minus 6 percent project was initiated by the Prime Minister. Its aim is to promote large-scale civic campaigns that counter-measure climate change. Its activities have in a short period of time (launched in 2005) expanded to include 1.1 million individuals and about 11 000 companies and organizations (as of March 2007). The Cool Biz campaign is one of these campaigns. It advises people to save energy by limiting air condition during summer and instead adjust their clothes. The winter counterpart is of course Warm Biz and carries the same message; to dress appropriate instead of using too much heat and electricity.

In Japan there are about 127 million people. Surveys showed that 94.9 percent was aware of the Cool Biz campaign and 59.6 percent were aware of the Warm Biz campaign. The campaigns are estimated to have reduced CO2 emissions by 1.14 millions tons (summer 2006) and 1.41 million tons (fall and winter 2005), respectively, to be compared with the total emissions of greenhouse gases (CO2 equivalent) of 1.38 billion tons in year 2005 (up 7.8 percent compared to 1990). (Ministry of Environment, 2007 a; Ministry of Environment, 2007 b)

A campaign with an increasing number of participants is the Uchi-Eco (home-eco) campaign, launched in October 2006. People are advised to make daily efforts in the field of food, clothing and housing. National campaigns are expected to produce enormous energy-saving effects, if promoted successfully. (Ministry of Environment, 2007 a)

3.2.2 Public Sector

The Cool and the Warm Biz are mandatory in governmental buildings and offices. Apart from that the government tries to use the public sector to create a demand for energy-efficient appliances and equipment. The national government and government-affiliated bodies are encouraged (under the Law of Promoting Green Purchasing enforced in 2001) to purchase energy-efficient office equipment and other products. (Japan for Sustainability, Sep 28 2007) For further reading about green procurement see The Swedish Institute for Growth Policy Studies, 2005 b.

3.2.3 Financing Programs

There are various financing programs to make it easier and encourage businesses to make the initial investment required by energy-saving measures. For example the environmental action program known as Eco Action 21 offers medium- and small-sized businesses loans at a preferential interest rate, to be used for introducing environmental measures. (Ministry of Environment, 2007 a)

In early December this year, the government decided to introduce a tax incentive in fiscal 2008 to encourage companies to reduce carbon dioxide emissions by their offices. Purchases of certain energy-saving equipment for commercial buildings will be subject to a special depreciation rule; firms that make purchases to upgrade their insulation, air conditioning, lighting or other facilities for this purpose will be able to write off 30 percent of the cost, in addition to an ordinary depreciation charge, in the first year. (Nikkei, 5 Dec 2007).

3.2.4 ESCO – a new business model

The *Energy Service Company* (ESCO) program is a new business model that has been launched and is expanding. An ESCO project offers energy-services to clients like building owners, and thereby saved energy costs and/or reduced utility costs. The savings resulting from the project implementation will serve as payment for project operators' expenditures. Measures could be introduction of various energy-saving equipment and systems, BEMS-utilized (Building Energy Management System) monitoring practices and efficient operation controls. The purpose of the system is to achieve comprehensive energy saving for an entire building (or house; HEMS) by monitoring the energy supply and demand in the entire building in order to be able to integrate efficient operation of equipment and facilities inside the building. (Ministry of Environment, 2007 a)

Since individual households are so small in size it is hard to make a profitable business out of them. Therefore they used to be outside the program. The Ministry of Environment received however a proposal from a bank and others who were entries in a Ministry-sponsored competition program for environmental business. The proposal, which received an award from the Energy Conversation Center, suggested the use of ESCO scheme for households, including preferential interest rate for loans to buy latest model energy-saving electrical appliances to replace their conventional machines. The Ministry of Environment concludes that this suggests that private enterprises will play more important roles in promoting CO2 emissions in the residential sector in the future. (Ministry of Environment, 2007 a)

3.2.5 Technologies with High Potential

There are many technologies that are currently at the RD&D stage but expected to contribute substantially to mitigation of global warming in the future, especially in the commercial, residential and transport sectors. Some of the technologies identified as having great potentials are:

- storage technologies for electricity and heat (e.g. batteries)
- utilization techniques for cryogenic heat or unused heat
- control technology for integration of heat systems etc.
- new materials and/or devices (below are examples to be found)

Technologies assumed to have high potential for energy efficiency in the transport sector is hybrid vehicles and Intelligent Transport Systems (ITS). (Ministry of Environment, 2007 a; The Institute of Energy Economics, Japan, June 18 2007)

In 2000 the Agency for Natural Resource and Energy developed an *Energy Conservation Technology Strategy* that is still valid. The strategy established an agenda for the main governmental R&D projects for energy conservation in demand side. The projects are coordinated by Energy Conservation Center and New Energy Industrial Technology Development (Energy Conservation Center, 05 Dec 2007). In brief the projects are:

Cross-sector:

- power electronics such as SiC (Silicon Carbide)
- highly efficient electro thermal conversion system
- ultra-low thermal conductive insulation materials using nano-scale control

Industrial sector:

- LNG (Liquefied Natural Gas) thermal systems
- reduction of bound energy in clean rooms

Commercial/residential sector:

- next-generation energy efficient PDP (Plasma Display Panels)
- highly efficient white LEDs (Light Emitting Diodes)
- triple-effect high-performance absorption-type hot water systems

Transportation sector:

- lightweight automotives using aluminium alloy, carbon nanofiber, etc.
- development of a diesel engine in the HCCI (Homogeneous Charge Compression-Ignition Combustion) system

(Japan Copper Development Association, Energy Conservation Center, 15 Nov 2007)

3.3 The Future

In 2007 the former Prime Minister Abe presented his Cool Earth 50 initiative. It proposes a long-term target of reducing emissions from green house gases by half from the current level by 2050, as a common goal for the entire world. To achieve this internationally Japan declares that one measure will be to expand the endeavor for improving energy efficiency. On a national level the motto of reducing green house gases by "1 person, 1 day, 1 kg" have been launched and included in the Team Minus 6 percent campaign. The initiative calls for efforts and creative ideas but energy efficiency is of course of great importance in order to achieve this target. The new Prime Minister Fukada continues with the Cool Earth 50 initiative. In early December Ministry of Economy, Trade and Industry announced in a press release that several companies now are supporting the Team Minus 6 percent project and the "1 person, 1 day, 1 kg" motto by offering sponsorship (Ministry of Economy, Trade and Industry, 4 Dec 2007; Ministry of Environment, 2007 a; Ministry of Foreign Affairs, 4 Dec 2007)

Japan has committed to a 6 percent reduction of CO2 emissions by 2012 (Kyoto protocol). According to a government estimate, CO2 emissions in 2010 will however have increased by 0.9-2.1 percent (compared with the year 1990) even if the industry reaches its goal of 6 percent. The government has therefore sought additional cuts from industry circles. (Yomiuri Shimbun, Oct 29 2007)

In October 2007, about 70 industries reported to the council of the Ministry of Environment and the Ministry of Economy, Trade and Industry on their plans to review their action programs. Most industries reported that they are raising their numerical targets. Among industries that find it difficult to achieve the targets already set are the Federation of Electric Power Companies and the Japan Iron and Steel Federation. They have instead revealed plans to increase the purchases of greenhouse gas emissions rights. The manufacturing sector eventually declared it would cut an additional 8.56 million tons of CO2 emissions, the highest among all industries. The Japan Automobile Manufacturers Association, decided to cut an additional emissions by raising its initial voluntary reduction target from the 1990 level by 2.5 percentage points (an extra 200 thousand tons of CO2). The association expects the additional cuts to be mainly from the production process; e.g.

by improving the efficiency of boilers, energy-saving at painting lines and streamlining the production process. (Yomiuri Shimbun, Oct 29 2007, American Embassy Oct 2007)

The increase in the commercial (44.6 percent) and residential sector (36.7 percent) is due to the widespread use of electronic office equipment, computers and large-size home electronics. Because of the increase, the government plans to submit an amendment (during the next ordinary Diet session) to the Energy Conservation Law that small stores, such as convenience stores, submit an energy-conserving plan. They also plan to review allowing shops to stay open 24 hours a day, a plan that upset the Japan Franchise Association, an association who left its numerical target for CO2 emission cuts unchanged. However, schools and hospitals account for about 30 percent of CO2 emissions from the commercial sector, a figure that advocates for more cuts. But The Federation of All Japan Private Schools and Japan Medical Association have not yet taken any action but emissions plans are expected soon (Yomiuri Shimbun, Oct 19 2007; American Embassy Oct 2007)

The planned amendments mentioned above are part of a revision of the law for promoting measures to combat global warming that the Ministry of Environment plans for Environment Ministry plans for fiscal year 2008. Another plan is to promote labels for electrical appliances that indicate the amount of CO2 emitted when produced and while the products are in use. (Yomiuri Shimbun, Oct 19 2007)

The revision has much to do with concern about not achieving the Kyoto Protocol commitment. Prime Minister Yasuo Fukuda said recently: Unless we devise a plan that will ensure we achieve the 6 percent reduction target, our words won't carry any conviction at the summit meeting. (Yomiuri Shimbun, Oct 19 2007)

The Ministry of Environment have for quite some time been wanting to introduce a carbon tax (or environmental tax, to be levied on gasoline and other fossil fuels), whereas Ministry of Economy, Industry and Trade as well as most business circles are opposed to the idea, business representatives arguing that such a tax would deprive them of freedom of economic activities. (Oshitani, 2006) American Embassy, Oct 2007)

The joint council between the two ministries is discussing a carbon tax as well as a domestic emission trading system. The ministries wants to encourage more companies to participate in the domestic emission trading system on trial, which currently has about 150 participants. (Yomiuri Shimbun, Oct 29 2007)

IT is also getting a lot of attention in relation to the environment. Next year, the Ministry of Economy, Trade and Industry will launch a "Green IT Project" aimed at cutting the amount of electricity consumed by information technology equipment. (Yomiuri Shimbun, 20 Oct 2007)

3.3.1 International cooperation

In December 2006, at an East Asia Summit the leaders signed the Cebu Declaration setting individual goals and promoting voluntary actions plans. Japan proposed Japan’s cooperation initiative, stating that Japan will accept 1000 trainees and dispatch 500 experts. This has been done before; since 2004 more than 700 trainees have been accepted and almost 300 experts dispatched in other Asian countries. Apart from East Asian countries, Japan cooperates with India. (Ministry of Economy, Trade and Industry, Nov 19 2007)

With China there is even more cooperation. In April 2007 The Energy Efficiency Model Project between China and Japan was launched. A committee designates projects suggested by private companies; five projects have been signed so far. Model projects in other

Asian countries have been done before though. The aim now is to stimulate information exchange on energy efficient equipment and technology and to promote business exchange. However; the most important thing for the committee to do is to provide a safety net for the companies interested in participating. If an IPR (Intellectual Property Rights) issue occurs, the committee will help to solve the issue. (Ministry of Economy, Trade and Industry, Nov 19 2007)

4 Conclusions

4.1 Energy Efficiency is for Everyone

As energy efficiency was once primarily a matter of energy security, initially it included only the energy intensive industry. Today, when energy efficiency also is a matter of mitigating climate change, the Japanese government tries to make energy efficiency everyone's business.

The Japanese government believes that energy efficiency policies for each sector should be complemented with policies to promote lifestyle changes and that the general awareness about why energy efficiency is necessary has to be increased.

Whether energy efficiency really results in less emission of course depends on the social system we are in; how we spend the money saved by the efficiency measures. The Japanese government to some extent recognizes this when promoting lifestyles changes and the need to invest also in education. They also state that mid- to long term energy conservation social systems need to be investigated (see 3.1).

The climate issue is global. The activities in foreign countries are of importance for everyone. Japan is seeking international, and especially Asian, cooperation in this matter. As Japan has come a long way when it comes to improving energy efficiency, even though not long enough, it is likely that the measures Japan has implement will influence other Asian countries. There is also a business opportunity imbedded in this development, as it creates potential for increased energy technology exports.

4.2 Implications for Sweden

Japan has a great variety of measures for improving energy efficiency. The measures are a result of Japanese business culture and policy making, adjusted for Japanese society. All measures can however, to some extent, give input to and influence, the Swedish proceedings in improving energy efficiency. Some of the projects, like the Cool and Warm Biz are not really valid for a cold country like Sweden, with much better insulation but also a different dress code, but the idea to make energy use more visible is indeed valid.

Japan has, compared to other countries (including Sweden) come a long way in their sector coverage, continuously extending this coverage. The voluntary agreements and the fact that many of the processes for gathering information (Top Runner Program, labels, etc.) is based on information from the manufacturer is also a result of Japanese business culture and governmental policy making; e.g. the relationship between the government and companies. Even if the measure - the way it is stipulated - is not of interest for Sweden, it is of interest to note that the Japanese government demands more and more from the business sector as well as the public. The concern about the climate issue grows with time. It will certainly be of interest to see what policy measures Japan will implement in the near future, as 2012 and the successor to the Kyoto Protocol is approaching.

It is interesting to note that the Japanese government recently announced that they will launch a "Green IT Project" aimed at cutting the amount of electricity consumed by information technology equipment.

As Japan has many projects already launched, there are results of interest for Sweden. An example is the development of systems to integrate efficient operation of equipment and facilities inside the building, by monitoring the energy supply and demand in the entire building. This would allow energy companies to sell a temperature instead of heat, cool or electricity. This has been discussed in Sweden, but not implemented to any significant extent. Such a change also requires new business models, another area where Japanese efforts can serve as an example.

But no matter how many interesting R&D projects, investments program and policy measures there are in Japan, maybe the most important thing to note is that the Japanese government is working hard to make energy efficiency everyone’s business.

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Changes in policy should be based on:

- Statistic data and analyses of the structure and dynamics of industry – to obtain an up-to-date view of future challenges and opportunities.

- Evaluation of results and effects of policy measures and programmes – to provide benchmarks and learn from measures implemented earlier.

- Policy intelligence in order to look outwards and ahead – what issues are likely to come on the growth policy agenda in the future?

These represent the principal missions of ITPS.

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