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Business Perspectives to Financial Subsidies for Industrial Energy Saving: A Survey Study in China and Korea

(◯) Xianbing LIU[1] and Sunhee SUK[2]

[Abstract] This paper presents a survey study to companies in China and Korea for understanding their opinions to financial subsidy policies for industrial energy saving. The survey in China was conducted during August 2012 to January 2013 and 201 respondents were confirmed to be valid. The survey to Korean companies was carried out during December 2012 to January 2013 and 150 samples were collected. The result indicates that Chinese companies commonly recognize the needs to financially support all the pre-listed fields. They agree that the limited public resources shall be used for the early stage of technology process, e.g., research, development and demonstration of energy saving technologies. In contrast, the surveyed Korean companies gave low to moderate priorities to the pre-listed fields for receiving financial incentives. Large gap was confirmed between the subsidies expected by surveyed companies and the actual level in both countries. The problems for the subsidy policy implementation were identified. The policy weakness in China include the limited coverage, small subsidy amount and the lack of transparency in implementation. Whereas, policy coverage and transparency are not recognized as problems in Korea. Korean companies favor the stable and long-term economic incentives, i.e., lower electricity price, rather than the one-time financial subsidies.

[1] Kansai Research Centre, Institute for Global Environmental Strategies (IGES)
Hitomirai East Building, 5F, 1-5-2 Wakinohama Kaigan-Dori, Chuo-ku, Kobe, 651-0073, Japan
E-mail: liu@iges.or.jp
[2] Affiliation and address are the same as above.
E-mail: sunhee@iges.or.jp

1. Introduction

A strong rationale exists for the dramatic mitigation of greenhouse gases (GHG) emissions and adequate policies should be in place for realizing the mitigation potential economically (Pachauri, 2012). Among the policy alternatives, command-and-control regulations (CCRs) provide some certainty in emissions levels and have been widely practiced. However, CCRs are inferior to market-based instruments (MBIs) in economic efficiency. The government shall learn to correct the externalities of carbon emissions by expanding the applications of MBIs, both economic incentives like financial subsidies and economic disincentives like carbon pricing tools.

The three largest economies in Northeast Asia, Japan, China and Korea, all rank in the top 15 countries of GHG emissions and are obviously important for the mitigation efforts globally. These three countries accounted for around 30% of the global energy-related CO_2 emissions in 2010 and China is the largest emitter in the world (ADB, 2013). In contrast to their huge GHG emissions, climate policies of the three countries is generally dominated by regulative and administrative measures and overall laggard in the pricing of carbon emissions (Liu et al., 2014).

Nevertheless, providing economic incentives, e.g., financial subsidies and tax credits, have been applied in the three countries to promote the investment in energy saving and low carbon technologies (LCT). Aiming to understand the progress in financial subsidy policies for industrial energy saving in Northeast Asia, this paper targets China and Korea and outlines the related policies in these two countries. As the main content, a survey to companies in China and Korea is summarized for clarifying the business opinions on various aspects of financial subsidies under implementation.

This paper is structured as follows. Section 2 outlines the related subsidy policies in China and Korea. Section 3 and 4 respectively describes the questionnaires survey to Chinese and Korean companies regarding their opinions on financial subsidy policies for industrial energy saving. Lastly, section 5 conclude the findings from the survey in both countries.

2. Outline of financial subsidy policies in China and Korea

2.1 Financial subsidy policies in China

Since the 11th five-year plan (FYP) period (2006-2010), China has been making great efforts to improve the country's energy efficiency. The main policy countermeasures include the setting of mandatory reduction targets in energy and carbon intensities; adjustment of industrial structure by the elimination of out-of-date manufacturing facilities; top 1,000 (Extended to 10,000 in the current 12th FYP period) energy-consuming enterprises program; ten key energy conservation projects; etc. In addition with the administrative approaches mentioned above, Chinese government provides more and more public resources to encourage and support energy saving in various forms. There exist two major financial subsidy policies in China. One is the subsidies and

rewards for energy saving retrofit projects. The other is the energy saving products promotion program for the benefit of public. The contents of these two policies are briefed as follows.

2.1.1 Financial rewards for energy saving retrofit projects in China

According to the 'Interim Management Measures of Financial Incentive Fund for Energy Saving Technology Retrofit' published in 2007, Ministry of Finance (MOF) allocates public funds to support ten types of key energy conservation projects. The incentives are given to the retrofit projects by means of rewards rather than subsidies. The key energy conservation projects refer to coal-fired industrial boilers renovation; waste heat and pressure utilization; oil conservation and alternatives for oil; energy conservation of motor system; energy system optimization and the other projects. The rewards for energy saving projects in eastern region was 200 Yuan per ton standard coal equivalent (tce) and 250 Yuan/tce for the projects in central and western areas (MOF and NDRC, 2007). The rewards have been increased to 240 and 300 Yuan/tce respectively since 2011 (MOF and NDRC, 2011).

The energy saving retrofit projects eligible for the rewards shall satisfy certain conditions. According to the amended rule, the project shall have been in operations no less than 3 years; energy saving capacity shall be no less than 5,000 tce; comprehensive energy use of the project in previous year of subsidy application shall be more than 20,000 tce; etc. During the 11^{th} FYP period, the central government provided 20 billion Yuan rewards for industrial energy-saving retrofit projects, stimulating local financial input of 29.7 billion Yuan and social capital investment of 497.8 billion Yuan. Correspondingly, the average cost of energy saving retrofit projects was 2,470 Yuan for generating per tce energy saving capacity (Qi, 2013).

2.1.2 Energy saving products promotion program for the benefit of public in China

In 2007, China launched subsidy program for promoting the consumption of energy efficient products, such as lighting, air conditioner, flat-screen TV, computers, motors, wind turbines, pumps and automobiles, etc. So far, the subsidized products include 3 major categories (Electronic appliances, automobiles and industrial products), 15 sub-categories and hundreds of thousands of product models. The fund from the central government has accumulated to more than 40 billion Yuan.

As examples of this program, the promotion of energy efficient lights started from 2007. For the bulk consumers, the subsidy is 30% of the light price, and for the other urban and rural users, the subsidy ratio is 50%. During June 2009 to May 2011, subsidies to air-conditioning with energy efficiency of grade 2 or higher level were granted. According to the cooling capacity and energy efficiency level, the subsidy varied between 150 and 250 Yuan per unit. Since June 2010, the consumers who buy energy efficient passenger cars of 1.6 liters or below may receive one-time subsidy of 3,000 Yuan from the central government. The requirements of subsidy for fuel efficient

vehicles were revised in 1 October 2011. For instance, the fuel use per 100 km was reduced from 6.9 liters to 6.3 liters.

In terms of policy effects, 655 million energy efficient lights were sold with the subsidy support during 2007 to 2012, which directly stimulated domestic demand of 8 billion Yuan. The central government provided nearly 4.157 billion Yuan to promote energy efficient lighting. The annual electricity saving is 18.5 billion kWh. From June 2009 to May 2011, more than 50 million energy efficient air conditioners were sold under the subsidy policy support, directly stimulating a consumption of over 150 billion Yuan. The market share of energy efficient air conditioners increased from 5% to 70% and the price decreased from 3,000-4,000 Yuan to around 2,000 Yuan. Accordingly, the subsidy for energy efficient air conditioners was 14.643 billion Yuan. The annual electricity saving amount is 10 billion kWh. Within the product life span, the total electricity saving would be 80-100 billion kWh (MOF, 2013).

2.2 Financial subsidy policies in Korea

2.2.1 Funding system for energy use rationalization projects in Korea

Established in 1981, this system provides financial support for long-term and low-interest loans to cover a portion of project costs of companies investing in energy saving facilities. It has supported 15,122 cases with a total budget of 4 trillion 396.5 billion won by the ‘Energy and Resources Special Account’ (Prior to 1995, it was ‘Oil Project Funds’). This system covers relevant facilities (Except for used equipment) and building equipment cost, project construction cost, design management cost and run test cost. However, VAT, land acquisition cost and construction cost for buildings not essential for the installation of energy saving relevant facilities are excluded. The categories of projects for receiving financial support of energy use rationalization system are: ESCO investment projects; TMS company investment projects; Energy-saving facility installation projects; Manufacturing facility installation projects (Including high-efficiency products); and, Demand management equipment installation projects. Under this system, a total of 211.9 billion won was assigned to large companies and 317.9 billion won was assigned to small and medium-sized companies in 2012.

Regarding the funding process, a company seeking for project funding submits an application to Korea Energy Management Corporation (KEMCO). After reviewing the issues related to the quality, performance, safety and contractor selection of the facility, the funding would be provided. When the nomination is approved, the funding applicant applies for loan through a designated financial institution and the financial institution makes a lending request to KEMCO. For the projects promoted by a public institution, the loan is directly provided by KEMCO. The lending amount is then given as a loan to the applicant and the financial institution and KEMCO perform the follow-up management.

There were some amendments for this system in 2012. One is the adjustment of project-specific budgets. The budget for TMS company investment projects was increased from 109.6 billion won in 2011 to 169.8 billion won in 2012. The budget was increased from 102.2 billion won to 150.0 billion won to accelerate energy-saving facility installation of SMEs. On the other hand, the private loan funds were reduced from 150.0 billion won to 70.0 billion won. The other is the adjustment in the support recipient candidates. Aiming to strengthen the electricity demand management support for the stable power supply, support was allowed even for demand management facility installation projects of non-profit corporations. The restrictions were eased on support for the electricity-generation facilities, like boilers, turbines and generators. The specific types of candidate facilities were reduced by omitting 19 long-term non-support equipment, such as fluidized bed heat treatment furnaces.

2.2.2 Tax credit for investments in energy saving facilities in Korea

This preferential tax policy promotes the business competitiveness through energy saving by providing tax deductions at certain percentages of the investments. From 2007 to 2011, 1,119 companies received a total of 1 trillion 94 billion 549 million won in this kind of tax deductions. When a domestic company invests by the end of 2013 in energy saving facilities that are designated by presidential decree, 10% of the investment will be deducted from the business income tax or corporate income tax. Applicants of tax credit submit the application prescribed by the decree of Ministry of Strategy and Finance (MOSF) along with the standard taxation return to the corresponding district tax offices.

The energy saving facilities covered by this system are: a) a total of 49 energy use rationalization facilities, such as boilers, automatic power control devices, automatically adjusting illumination lighting, etc.; b) new and renewable energy supply facilities that generate fuel, heat or electricity; and, c) other facilities that are recognized by KEMCO as necessary to be a model in accordance with the ‘Energy Use Rationalization Act’. The improvement of the facilities in energy efficiency shall be over 10%. Manufacturing facilities for producing equipment for new energy and renewable energy include 47 solar equipment; 6 wind power equipment and 2 hydroelectric equipment.

For energy use rationalization facilities and new/renewable energy supply facilities that are designated by the ordinance of MOSF, the candidates apply directly to the corresponding district tax office. For the other facilities recognized by KEMCO, the district tax office is notified after verified by KEMCO. The scale of tax credit for energy-saving facility investment has been increasing in the number of companies and the credit amount. During 2007 and 2011, an average of 80 SMEs received 6 billion 692 million won of tax deductions annually. For general businesses, an average of 144 companies received 212 billion 218 million won in tax deductions annually in the same period.

2.2.3 High efficient equipment subsidy projects in Korea

This project provides individuals or groups that install high efficient devices a certain amount of funding through the electric power industry infrastructure fund. It was started in 1994 as a high-efficiency lighting support project by Korea Electric Power Corporation (KEPCO) and since 2002 became a joint project with KEMCO. Currently, it is pursued as a project of KEPCO only. The candidate products change every year and include lighting equipment, inverters, motors, vending machines, pumps, chillers, transformers, etc. In 2012, support was provided for lighting equipment (LED emergency lighting, LED lights), high-efficiency inverters and high-efficiency chillers. During 2001 to 2010, a total of 378.6 billion won was provided. The budget was 49 billion won in 2011 and 50 billion won in 2012.

After submitting an installation plan to KEPCO and appropriate district office, the applicants proceed with installations after the evaluation and approval. After the installation and request of support funding, KEPCO conducts the site validation and pays the funds.

3. Survey to Chinese companies on financial subsidy policies

3.1 Questionnaire survey in China and the distribution of samples

During August 2012 to January 2013, a questionnaire survey was carried out in China aiming to measure the preference of companies to various design options of carbon pricing policies, e.g., carbon taxation and GHG ETS. The opinions of companies on financial subsidy policies for industrial energy saving were qualitatively measured, too. The survey targeted energy and/or environmental managers of companies at the medium level since they are responsible for the company's energy management in practice. Over a period of six months, the survey was coordinated by two universities as local research partners. School of Environment, Tsinghua University in Beijing, helped the post and collection of questionnaires from the companies in the western Shanxi Province together with a local institute, Shanxi Academy for Environmental Planning. College of Environmental Science and Engineering, Tongji University in Shanghai, arranged the survey to companies in the eastern coastal Jiangsu Province. As the result, 104 companies in Shanxi responded, the number of valid samples from Jiangsu was 97, and a total of 201 respondents were confirmed to be useful for the analysis.

The distribution of valid samples by size, sector and ownership is listed in Table 1. The samples from chemical, power generation and iron & steel industries individually account for 19.9%, 15.4% and 11.4% of the total. Twelve cement companies and 7 paper companies responded the survey, with a share of 6.0% and 3.5%. The remaining 43.8% is the respondents from other sectors. Among the total 201 samples, 51 are small companies, having less than 300 staffs, or an annual turnover of below 30 million Yuan, or a registered capital of less than 40 million Yuan. Seventeen companies are large ones, with more than 2,000 employees, an annual turnover of more than 300

million Yuan and a registered capital of over 400 million Yuan. The other 133 are medium-sized companies according to the classification criteria of National Bureau of Statistics of China (NBSC). The ratio of small, medium and large companies is respectively 25.4%, 66.2% and 8.5%. By the ownership, 77 are domestically private companies, accounting for 38.3% of the total. State-owned companies have the second share of nearly 25%. Foreign-funded companies, including fully foreign-funded and joint-ventures, account for 27.3%. There are 5 companies with collective ownership and 14 companies checked the other ownerships.

Table 1: Distribution of the respondents by size, sector and ownership in China

Sector	Number of samples			In total (Percentage)
	Size			
	Small	Medium	Large	
Iron & steel	0	15	8	23 (11.4)
Cement	3	9	0	12 (6.0)
Paper	3	3	1	7 (3.5)
Chemical	10	28	2	40 (19.9)
Power generation	3	26	2	31 (15.4)
Others	32	52	4	88 (43.8)
In total (Percentage)	51 (25.4)	133 (66.2)	17 (8.5)	201 (100.0)
Ownership	Size			In total (Percentage)
	Small	Medium	Large	
State-owned	3	40	7	50 (24.9)
Collective-owned	1	4	0	5 (2.5)
Domestically private	22	47	8	77 (38.3)
Full foreign	12	16	2	30 (14.9)
Joint-venture	8	17	0	25 (12.4)
Others	5	9	0	14 (7.0)
In total (Percentage)	51(25.4)	133(66.2)	17 (8.5)	201 (100.0)

3.2 Opinions of Chinese companies to financial subsidy policies

3.2.1 Involvement of the samples in subsidy and reward policies for energy saving

The companies were asked to check whether they applied for the subsidies and rewards from the governments at various levels in the past. For the companies with applications, they were further requested to confirm whether they attained the subsidies successfully. A total of 199 respondents answered this question. Among which, 133 companies, accounting for 66.8%, confirmed that they once submitted the applications for energy saving subsidies and rewards. The other 66 companies, with a share of 33.2%, never applied. Within the 133 companies with applications, 122 successfully got the subsidies and rewards. The number of companies with failure in applications

is only 11. Most respondents (73) received the subsidies from the provincial governments. Only 18 companies enjoyed the subsidies from the national government. The number of companies with subsidies from municipal and country-level governments is 33 and 41, respectively.

Fig.1 shows the distribution of samples, which achieved the subsidies in the past, by the ratio of subsidies in their investments in energy saving projects. It is indicated that the subsidy and reward is not significant in amount. 38.0% of the respondents confirmed a ratio of less than 1% of the subsidy and reward in their energy saving investment. The share of samples with subsidy ratio of 1-3% is 19.8%. Only 3.3% got subsidies and rewards over 30% in their investment for energy saving.

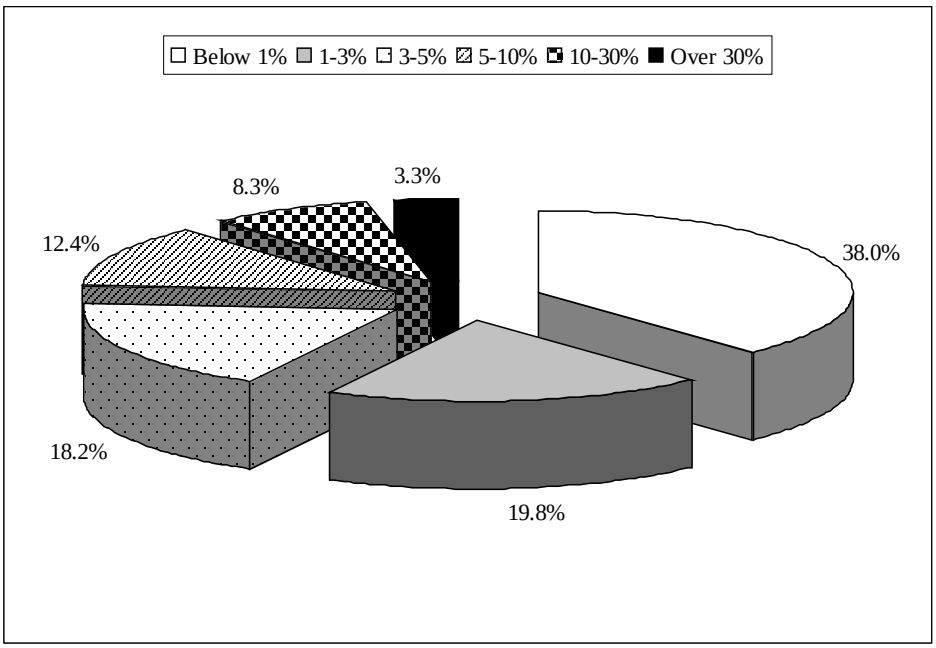

Fig.1: Distribution of samples in China by subsidy ratio in energy saving investment (N=122).

3.2.2 Opinions of the companies to priority fields of energy saving subsidies

The companies were requested to give their subjective evaluations to priority degrees of ten pre-listed fields (Abbreviated as F01 to F10) that shall be supported by financial subsidies and rewards at national and local levels. A five-point scale was adopted for the evaluation, with '5' = 'very high'; '4' = 'high'; '3' = 'moderate'; '2' = 'low'; and, '1' = 'very low'. The statistics of scores presented by the respondents are shown in Fig.2.

All the pre-listed fields achieved a mean of no less than 3.50, revealing the common recognition of companies that these fields shall be supported by financial subsidies. Comparatively, F02 (R&D of new energy saving technologies, processes and products) was given the highest mean of 4.07. The field with the second highest mean of 3.98 in priority is F03 (Demonstration and diffusion of new energy saving technologies and processes). This result implies that companies agree with the idea

that the limited financial resources should be used at the early stage of energy saving technology cycle, like research, development and demonstration of new technologies and processes. The fields with relatively high average scores in priority include F01 (Development and utilization of new energies, e.g., wind, solar and biomass), F04 (Diffusion of energy efficient products, e.g., air conditioner, vehicle and lighting), F05 (Energy saving retrofits of existing production facilities and equipment) and F06 (Compensate to the elimination of out-of-date facilities of energy-intensive industries), with a mean of 3.93, 3.88, 3.87 and 3.70 subsequently. This confirms the company's perception in the high importance of shifting the energy consumption in China to be less carbon-intensive.

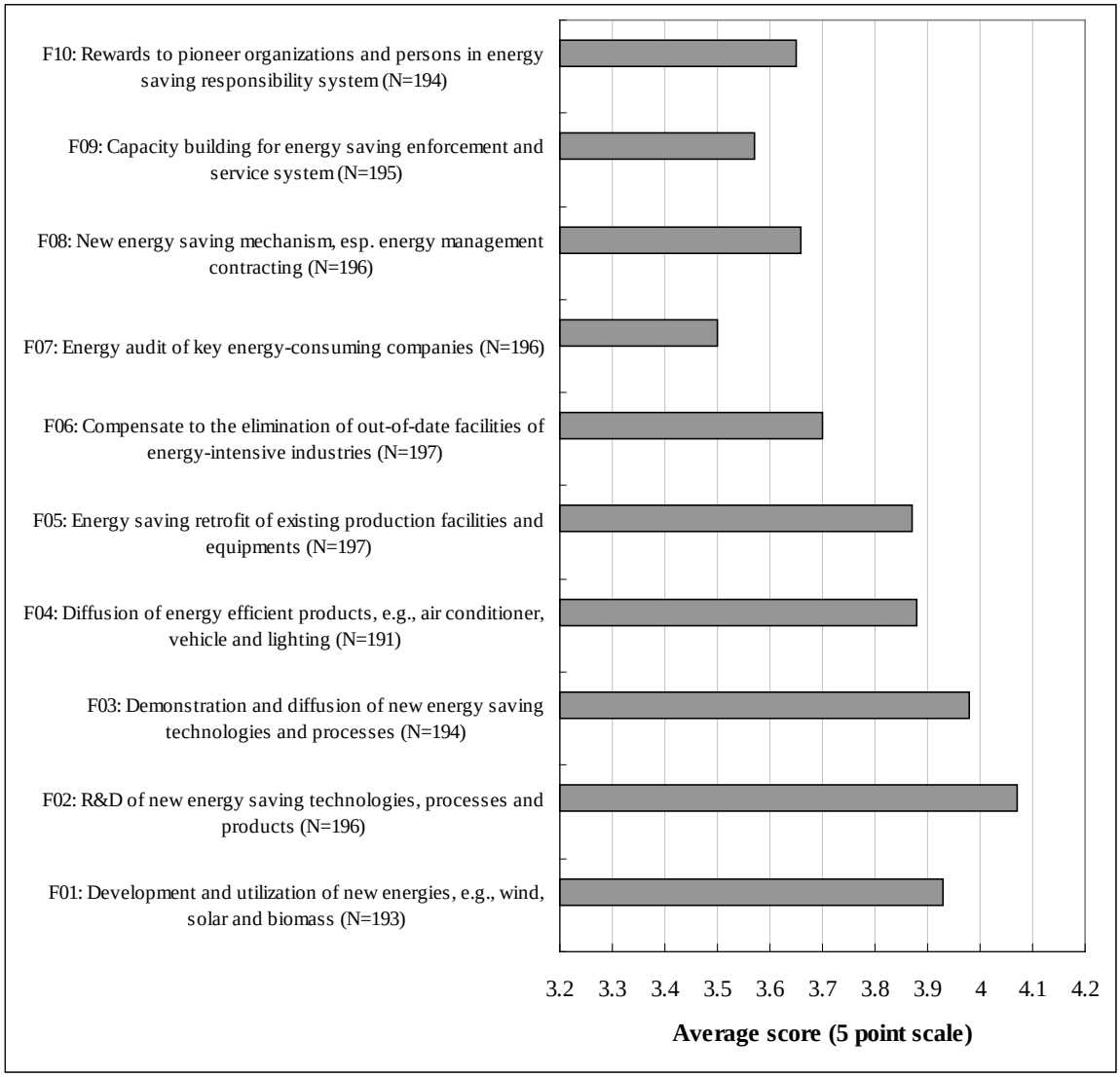

Fig.2: Company evaluation of the field priority for receiving financial subsidies in China.

It is also necessary to provide economic incentives to the surveyed companies for them to replace their out-of-date manufacturing facilities and equipment for better energy efficiencies. On the

other hand, the management measures for energy saving achieved relatively lower scores in priority for being subsidized. For examples, F07 (Energy audit of key energy-consuming companies), F09 (Capacity building for energy saving enforcement and service system) and F10 (Rewards to pioneer organizations and persons in energy saving responsibility system) were presented an average score of 3.50, 3.57 and 3.65, respectively.

3.2.3 Expectations of companies to the level of energy saving subsidies

The distribution of respondents by the expected ratios of energy saving subsidies and rewards in overall investments is depicted in Fig.3.

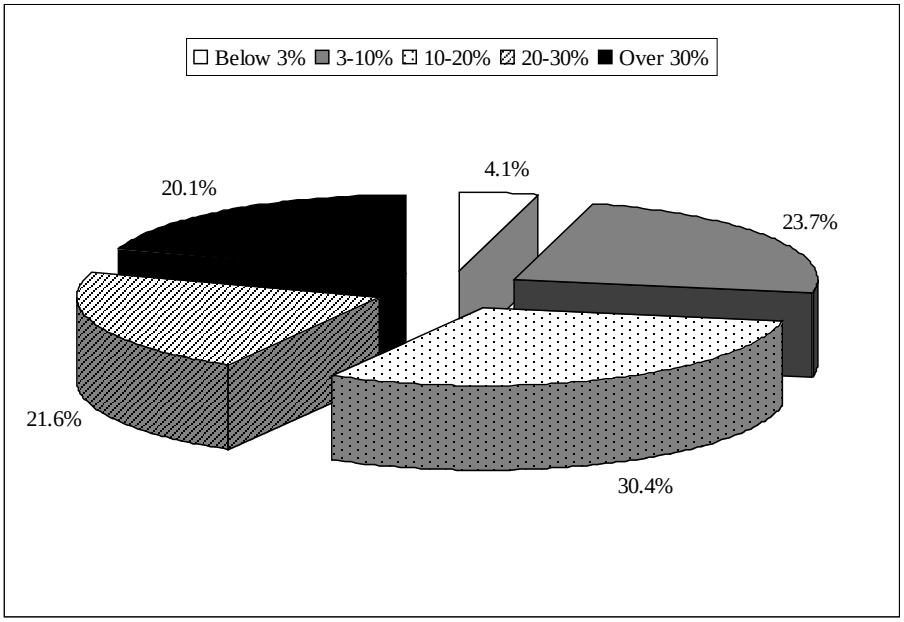

Fig.3: The distribution of samples by the expected subsidy ratio in China (N=194).

Among the 194 companies with answers for this question, 23.7% of them expect a ratio of 3-10% for the subsidies and rewards in energy saving investment. Fifty nine companies, with a share of 30.4%, view a ratio of 10-20% to be appropriate. 21.6% and 20.1% of the samples expect a ratio of 20-30% and more than 30% for energy saving subsidies and rewards. This reveals the large gap between the subsidy level expected by companies and the actual level in practice, as summarized in Fig.1.

Fig.4 summarizes the distribution of samples by answers of appropriate periods for the subsidies to loan interests for the investment in energy saving retrofit and equipment replacement. Nearly 40% of the samples selected 3 years as the rational period for the subsidization of loan interests. One forth respectively expects a period of 5 years and even longer. Providing subsidies for the exemption of loan interests for 1 or 2 years is not enough for the surveyed companies. Only 2.1% and 10.2% of the samples individually checked these two options.

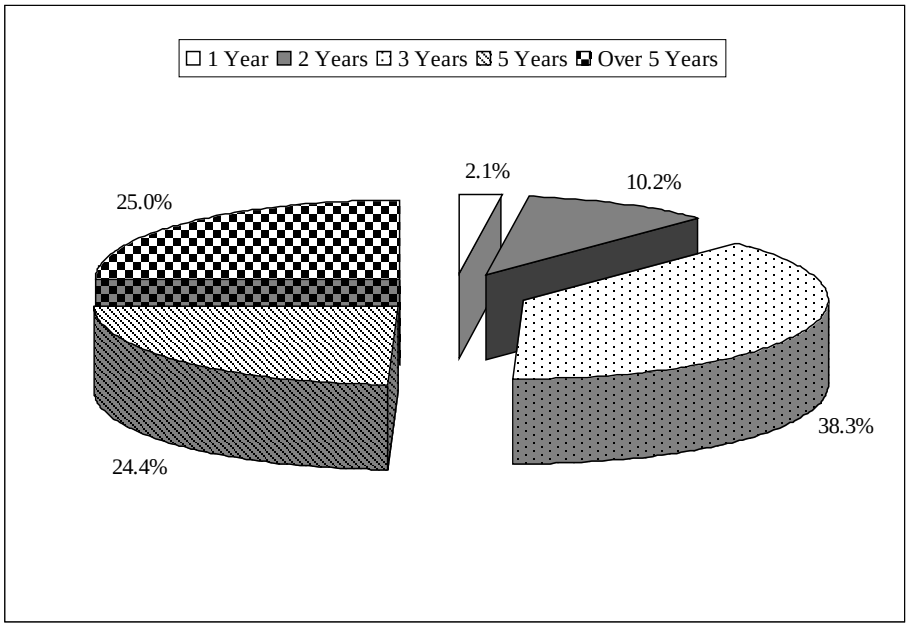

Fig.4: The distribution of samples by rational period for loan interest subsidization (N=195).

3.2.4 The problems for the implementation of energy saving subsidy policy in China

Aiming to understand the company opinions on the shortcomings of energy saving subsidy and reward policy of China, the respondents were asked to present their agreement degree to six pre-listed problems in policy implementation, which are abbreviated as P01 to P06. A five-point scale was applied, with '5' = 'very agree'; '4' = 'agree'; '3' = 'moderate agreement'; '2' = 'not agree'; and, '1' = 'completely disagree'. The statistics of this question are listed in Fig.5.

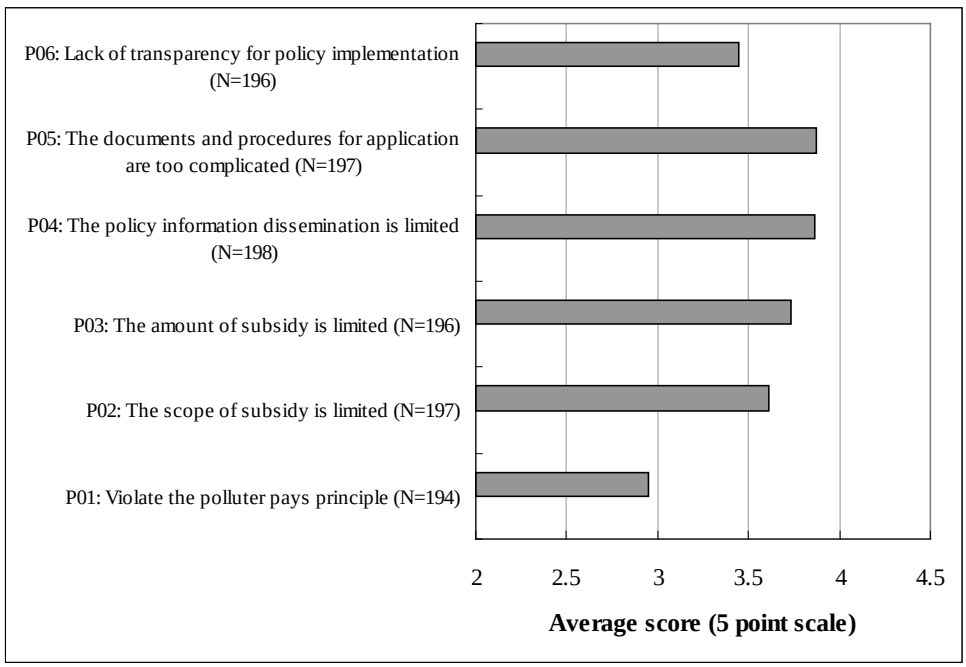

Fig.5: Evaluation of companies to problems of energy saving subsidy policy in China.

The companies do not think providing financial subsidies and rewards for industrial energy saving is against the polluter pays principle (P01) and this item achieved the lowest mean of 2.95. No significant difference exists in the agreement level of companies to the other five problems, which were given average scores between 3.45 and 3.87. Agreeing with the drawbacks in the limited policy coverage and subsidy amount and the lack of transparency in policy implementation, the surveyed companies addressed the problem in policy information sharing and the complexity for application document preparation. P04 (The policy information dissemination is limited) and P05 (The documents and procedures for application are too complicated) obtained the two highest means of 3.86 and 3.87, respectively.

4. Survey to Korean companies on financial subsidy policies

4.1 Questionnaire survey in Korean and the distribution of samples

The questionnaire survey to identify the opinions of Korean companies on financial subsidy policies for industrial energy saving was carried out during December 2012 to January 2013. Similar to the survey in China, company energy or environmental managers at the medium level were targeted in the survey of Korea. The questionnaires were sent to a total of 230 companies and 150 responded and were confirmed to be valid. The distribution of samples by size and sector is listed in Table 2.

Table 2: Distribution of the respondents by size and sector in Korea

Sector	Size				In total
	Small	Medium	Medium-large	Large	(Percentage)
Iron & steel	1	13	8	4	26 (17.3)
Cement	6	4	3	1	14 (9.3)
Chemical	3	23	13	13	52 (34.7)
Paper making	3	27	6	0	36 (24.0)
electronics	0	1	12	9	22 (14.7)
In total	13	68	42	27	150
(Percentage)	(8.7)	(45.3)	(28.0)	(18.0)	(100)

The samples from iron & steel, cement, chemical, paper-making and electronic industry individually account for 17.3%, 9.3%, 34.7%, 24.0% and 14.7% of the total. By organizational size, 13 are small companies and 27 are large ones. The rest 110 are medium-large or medium-sized companies. The ratio of small, medium, medium-large and large companies is individually 8.7%, 45.3%, 28.0% and 18.0%. By ownership, 110 companies are domestically private ones, accounting for 73.3% of the total. The number of foreign-funded companies (Fully foreign-funded and joint-ventures) is 40, sharing the other 26.7%.

4.2 Opinions of Korean companies to financial subsidy policies

4.2.1 Involvement of the samples in subsidy policies for energy saving

Aiming to understand involvement status of the surveyed companies in soft loan, tax incentive and reward policy for energy saving, which are under implementation in Korea, the samples were asked to check whether they have applied for these subsidies from the governments at various levels. For the companies with application experience, they were requested to further check whether they have successfully achieved the subsidies. All the 150 respondents provided answers for the subsidy application question. The result indicates that only small number of surveyed companies received preferential long-term loans (38.7% of the total), tax incentive (15.3%) and energy saving reward (17.3%).

4.2.2 Opinions of Korean companies to priority fields of energy saving subsidies

The companies were requested to give their subjective evaluations to ten pre-listed fields (Abbreviated as F01 to F10) to be supported by financial subsidies and rewards for industrial energy saving. The same as the survey in China, a five-point scale was adopted for the evaluation, with '5' = 'very high'; '4' = 'high'; '3' = 'moderate'; '2' = 'low'; and, '1' = 'very low'. The statistics of scores presented by the respondents in Korea are listed in Fig.6.

Different with their Chinese counterparts, the surveyed Korean companies do not think that the pre-listed fields shall be supported by public finance. All the listed fields achieved low to moderate evaluations in priority for receiving economic incentives. Comparatively, F06 (Compensate to the early and voluntary elimination of out-of-date production capacities of companies in energy-intensive industries) was presented the highest mean of 3.24. The area with the second highest mean of 3.13 in priority is F10 (Rewards to pioneer organizations and persons in energy saving target responsibility system). The following fields with relatively higher scores in priority are: F04 (Promotion of energy efficient products, like air conditioner, automobile and green lighting), F05 (Energy-saving retrofit to the existing production process and equipment), F07 (Consultative service like energy audit for the key energy-consuming companies) and F03 (Demonstration and diffusion of new technologies and processes for energy saving), with a mean of slightly over 3.0.

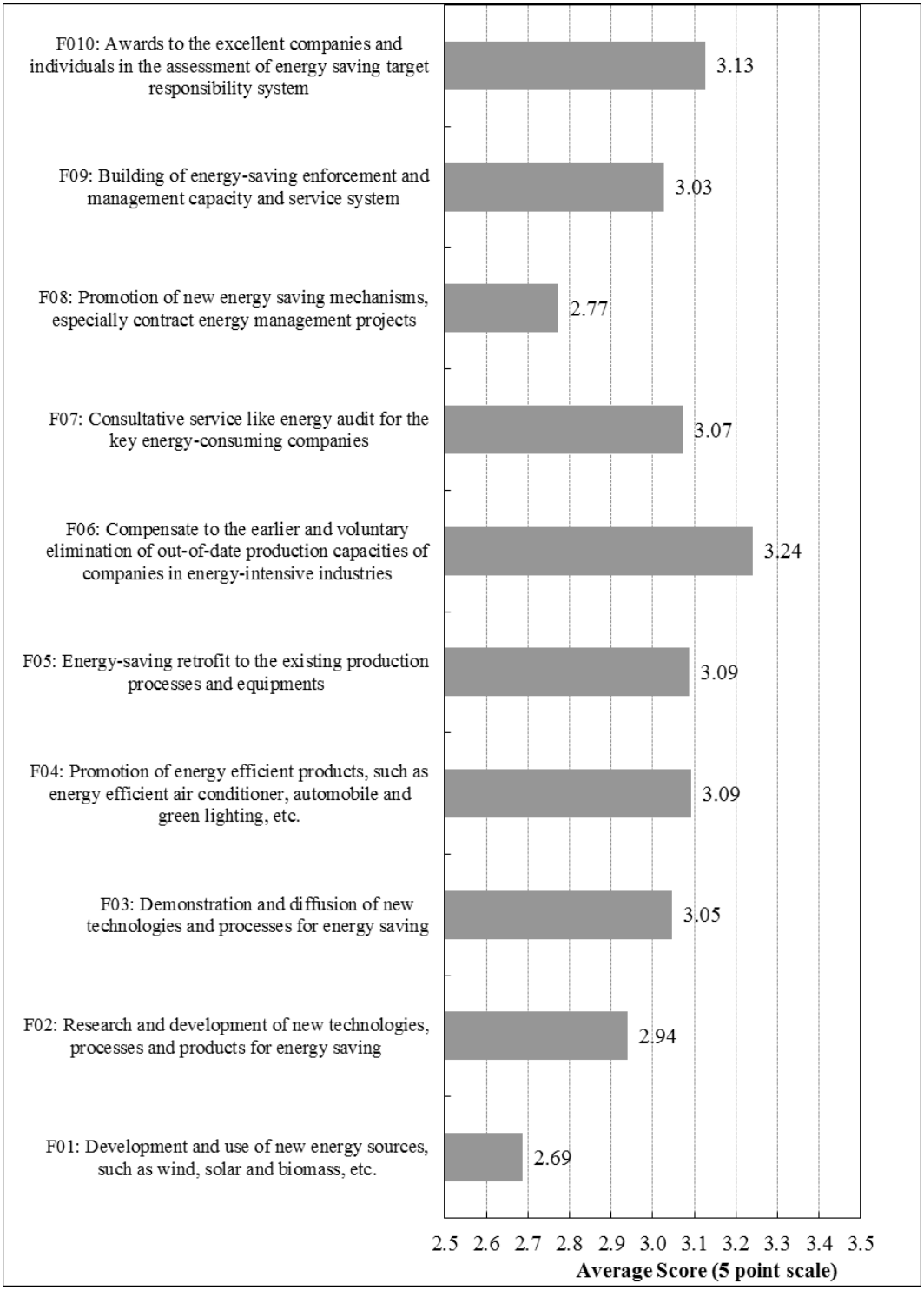

Fig.6: Company evaluations of the field priority for financial subsidies in Korea (N=150).

4.2.3 Expectations of Korean companies to the level of energy saving subsidies

The distribution of Korean samples by their expected ratios of financial subsidies in overall energy saving investments is depicted as in Fig.7. All the 150 respondents provided their answers for this question. Among which, 44.0% expect a ratio of more than 50% for the subsidies in energy saving

investment, 10.0% view a ratio of 40-50% being appropriate. This result reveals a large gap between the subsidy degree expected by companies and the actual level of subsidies in Korea.

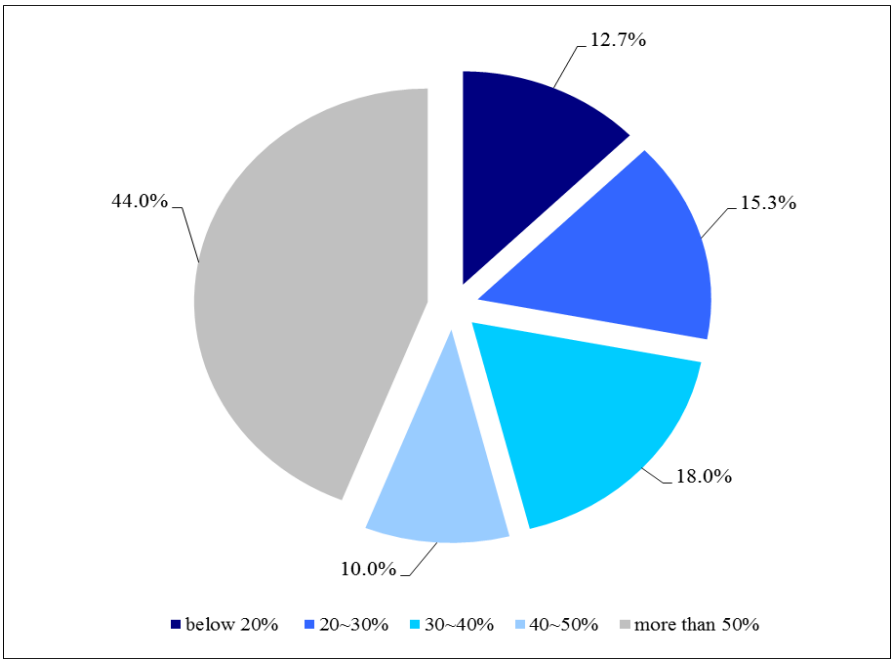

Fig.7: The distribution of Korean samples by the expected subsidy ratio (N=150).

4.2.4 The problems for the implementation of energy saving subsidy policies in Korea

In order to understand company opinions to the shortcomings of financial energy saving subsidies in Korea, the samples were asked to present their agreement degree to nine possible problems for policy implementation, which are abbreviated as P01 to P09. A five-point scale was applied, with '5' = 'very agree'; '4' = 'agree'; '3' = 'moderate agreement'; '2' = 'not agree'; and, '1' = 'completely disagree'. The statistics of scores provided by the respondents are listed in Fig.8.

Similar to the survey in China, Korean companies do not think that providing financial subsidies for industrial energy saving violates the polluter pays principle (P01). This item achieved the lowest mean of 2.28. The subsidy policy coverage and the transparency in policy implementation are not problems from viewpoints of the sampled Korean companies. P06 (The policy implementation is not open and transparent) and P02 (The subsidy scope is limited and non key energy-consuming companies and SMEs have no chance to get the subsidies) achieved similar average scores at around 3.0. On the other hand, P09 (Stable and long-term institutional support such as lower electricity price is more important than the short-term subsidies for equipment installation) was presented the highest means of 4.19. This implies that Korean companies prefer to the stable and long-term support, e.g., lower electricity price, rather than the one-time financial subsidies. P04 (The policy information dissemination is limited) and P05 (The documents and procedures for application are too complicated) obtained two other highest means of 3.91 and 3.89, respectively.

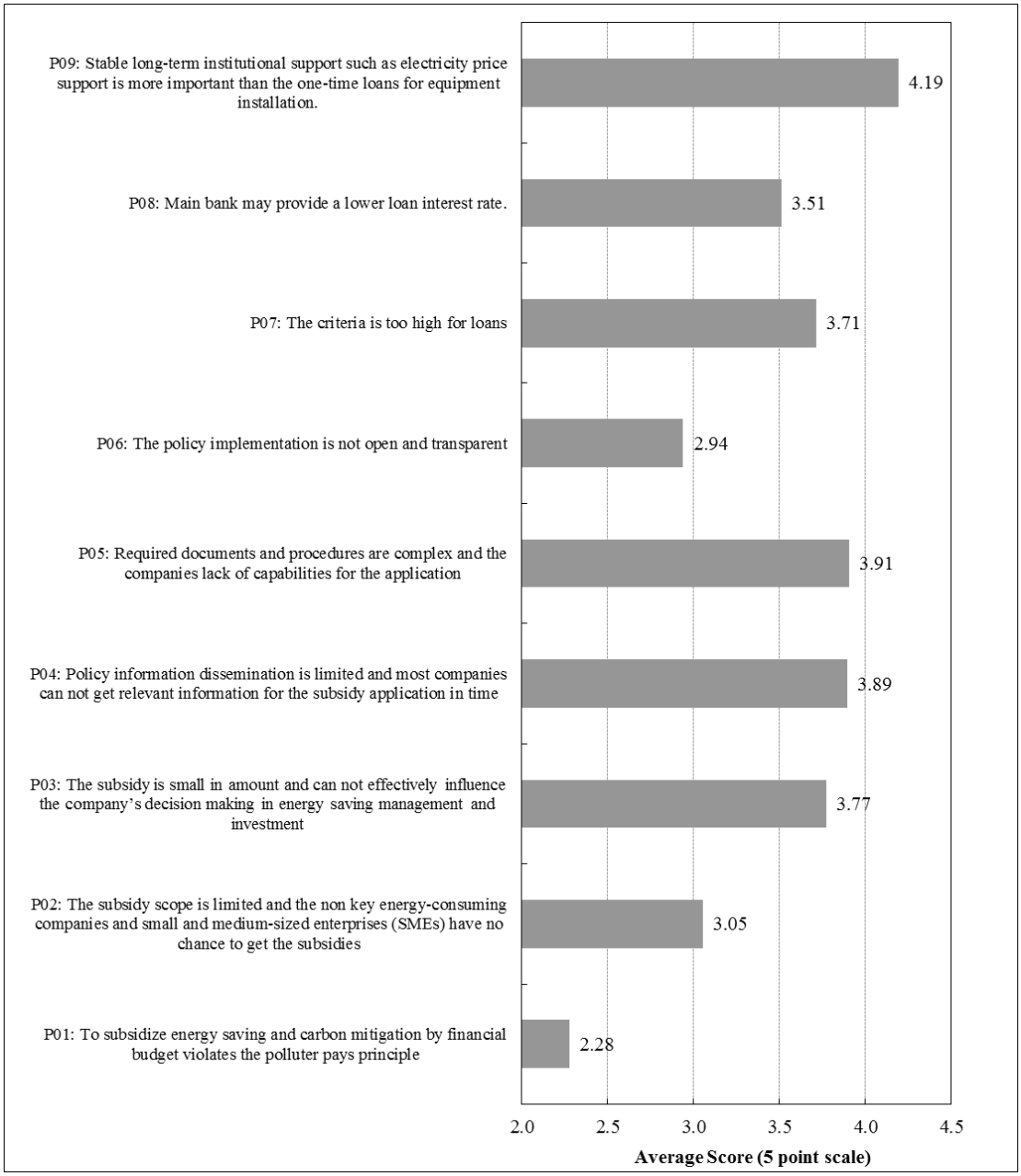

Fig.8: Evaluations of Korean companies to the weakness of energy saving subsidies (N=150).

5. Conclusions

This paper briefly outlines the financial subsidy policies for industrial energy saving in China and Korea, and then summarizes a survey study to the companies in these two countries for clarifying their opinions on the ongoing financial subsidies. The result indicates that involvement of the surveyed companies in subsidy policies is not encouraging. Especially, only a small ratio of companies have applied and enjoyed these economic incentives in Korea. The actual level of financial subsidies is much less than the degree expected by the sampled companies in both countries. Chinese companies prioritize nearly all the pre-listed fields for receiving the financial

subsidies, whereas, their Korean counterparts indicate different viewpoints. It is meaningful that the surveyed companies in China agree that the limited public resources shall focus on the early stage of energy saving technologies, e.g., research, development and demonstration of technologies. This is consistent with suggestions of the previous empirical studies. The samples in China addressed the weakness of current subsidy policies, including the limited coverage, lack of transparency in implementation, marginal information sharing and complicated procedure for the subsidy application. Comparatively, Korean companies more prefer to the long-term and stable economic incentive, i.e., lower electricity prices, rather than the one-time financial subsidies. The findings of this survey study are useful for the two countries to improve their practices of financial subsidy policies in the future.

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