Actual State of Greenhouse Gas Reduction by SMEs

—Based on an analysis of the "Survey on SMEs' Efforts toward Decarbonization"—

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Abstract

With the progress of global warming caused by greenhouse gases (GHGs), major climate change has been observed around the world. In response, countries all over the world are setting GHG reduction targets. The government of Japan set a target to realize a decarbonized society with virtually zero artificial GHG emissions by 2050. GHGs are generated in various sectors of human activities. The business of SMEs is no exception. This paper analyzes the progress of SMEs' efforts to reduce GHGs and the challenges involved in their efforts based on the result of the "Survey on SMEs' Efforts toward Decarbonization" conducted by Japan Finance Corporation Research Institute in August 2022.

As a result, we found that: more than 40% of the enterprises are implementing "overall" initiatives for GHG reduction; the implementation ratio varies depending on the initiative type; initiatives are more advanced in larger enterprises in terms of the number of staff members and yearly sales; and business conditions and the progress of the initiatives positively corelate. As challenges involved in the initiatives, respondents cited monetary, operational and information-related issues. In order to overcome the challenges and accelerate the initiatives, SMEs want measures including subsidies/tax incentives, favorable treatment in fundraising, accessible social systems, products services, government support and information provision.

For GHG reduction of the whole country, it is necessary to construct a system for the whole of society that will encourage ambitious initiatives by SMEs that form a large part of economic activities. However, encouragement through subsidies, tax incentives and other similar measures cannot be used limitlessly. Reduction in the burden on management through supply of low-price, high-quality products and services contributing to GHG reduction is essential for acceleration of the initiatives. The authors hope that SMEs flourish in businesses contributing to GHG reduction and accelerate GHG reduction efforts of the entire country.

1 Introduction

(1) Awareness of the Issue

With the progress of global warming, major climate change has been observed around the world: large-scale weather disasters are occurring all over the world, while an increase in incidents of heavy rain and heat waves is observed in Japan as well.[1]

It is believed that the major cause of global warming is the increase in Greenhouse Gases (GHGs), including carbon dioxide from human activities. In the "Special Report on Global Warming of 1.5°C" published in 2018, the Intergovernmental Panel on Climate Change (IPCC) presented data showing that the global average temperature in 2017 increased about 1°C compared with the average for 1850-1900, before industrialization. The report suggests that an increase exceeding 1.5°C is likely to have irreversible impacts on the environment and ecosystems, while it may be possible to suppress the increase to around 1.5°C if we can achieve decarbonization (carbon neutrality), namely the balancing of artificial emissions and absorption/fixation by around 2050.

In response to the situation, the Glasgow Climate Pact that was adopted in 2021 set a suppression of temperature rise under 1.5°C as an effective international target and countries around the world set their GHG emissions reduction target. The government of Japan set a goal to realize a decarbonized society by 2050.[2]

GHGs are generated from various fields of human activities. The business of SMEs is no exception. Therefore, this paper looks at how SMEs' efforts toward GHG reduction is progressing, what challenges they face and how the challenges can be solved based on the results of the "Survey on SMEs' Efforts toward Decarbonization" conducted by Japan Finance Corporation Research Institute in August 2022. Initiatives for GHG reduction include "reduction of GHG emissions" and "preservation and strengthening of GHG absorption effects." Combined, the two directions are expressed as "GHG reduction" in this paper.

(2) Procedures for the Survey

Procedures for the questionnaire survey are shown in Table-1. Scope of the survey is SMEs with 5 to 299 staff members, excluding real estate lessors.[3] From among individual monitors registered with a survey

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[1] According to the website of Japan Meteorological Agency (https://www.data.jma.go.jp/cpdinfo/extreme/extreme_p.html) the annual frequency of heavy rain with hourly precipitation exceeding 50mm was 328 on average in the 10 years from 2013 to 2022, or 1.5 times of the average in 1976-1985 (226). The annual number of days with a highest temperature of 35°C or more on average at 13 points across the country is 2.7 days in 30 years from 1993 to 2022, or 3.5 times the average in 1910-1939 (0.8 days).

[2] The Global Warming Prevention Headquarters set up at the Cabinet Office announced on April 22, 2021: "We aim to reduce our greenhouse gas emissions by 46 percent in fiscal year 2030 from the fiscal year 2013 levels, by setting an ambitious target aligned with our 2050 goal. Furthermore, we will continue strenuous efforts in our challenge to aim at the goal of cutting our emissions by 50 percent."

[3] The number of staff members includes the CEO. There should be some enterprises with 4 or less staff members implementing initiatives to reduce GHGs. However, considering that their implementation ratio of individual initiative types may be lower compared with larger companies, the survey does not include enterprises with 4 or less staff members, in order to ensure the sample size of implementing enterprises.

Table-1 Procedures for the Survey

Period of survey	August 2022
Scope of survey	SMEs with 5 to 299 staff members (Excluding real estate lessors.)
Survey method	Internet survey (anonymously answered)
Number of responses	1,666

company the authors extracted CEOs of enterprises within the scope of the survey and asked them to include their enterprises' efforts toward decarbonization in their answer via the internet. 1,666 samples were collected.

Distribution of the industry types and number of staff members of the collected samples may be different from the actual distribution of the enterprises in Japan. In order to reduce bias in the sample selection, we weighted the data to conform to the enterprise distribution by industry type and number of staff members of "Economic Census for Business Activity" (2016) of Ministry of Internal Affairs and Communications and Ministry of Economy, Trade and Industry.[4] All data in this paper are weighted. However, the numbers of responses (n) are the actual numbers.

(3) Characteristics of the Responding Enterprises

Here, we look at the characteristics of the enterprises who answered the questionnaire. As to industry type, "Manufacturing" accounts for the largest part, at 14.4%, followed by "Services" (14.3%), "Construction" (14.0%), "Medical, Health care and Welfare" (13.6%) and "Retail trade" (12.7%) (Table-2). Because of weighting based on industry type, these ratios are the same as the actual company distribution in Japan.[5] Data by industry type are also shown in the analysis of the questionnaires. There may not be a major problem in observation of the trend by industry type, because there is a certain number of responses (more than 100 of many industry types, and 37 of "Real estate" is smallest).

Next, let us check the data of enterprise size. Looking at the distribution of the number of staff members, "5 to 9" accounts for 50.1% (Figure-1), followed by 26.1% of "10 to 19," 15.5% of "20 to 49" and 8.3% of "50 to 299," which makes the average 20.0 staff members. Because the number of staff members is also weighted, the proportions are the same as that of the number of enterprises by the number of staff members in Japan.[6]

Looking at the distribution by yearly sales, which is another indicator of enterprise size: "less than 10 million yen" is 9.2%; "from 10 million to under 50 million yen" is 25.9%; "from 50 million to under 100

[4] For details of weighting, see the Reference Tables (pp.31-34)
[5] Strictly speaking, there is a slight error because "Real estate lessors" are not included.
[6] Same as Footnote 5

Table-2 Industry Types

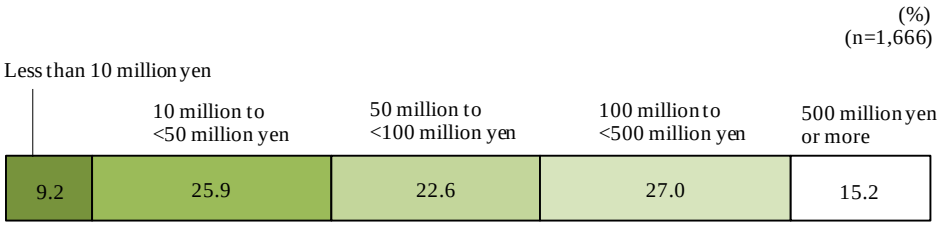
(%)

Industry Type	Proportion	n
Construction	14.0	271
Manufacturing	14.4	262
Information and Communications	1.7	112
Transportation	3.4	114
Wholesale	8.3	95
Retail trade	12.7	141
Restaurant and Accomodations	11.5	111
Medical, Health care and Welfare	13.6	134
Education, Learning support	2.4	70
Services	14.3	279
Real estate	1.8	37
Other	1.9	40

Source: "Survey on SMEs' Efforts toward Decarbonization," Japan Finance Corporation Research Institute (the same hereinafter)
Note 1: "Food takeout/delivery service" is included in "Retail trade." "Real estate lessors" are excluded (the same hereinafter).
2: Ratios are calculated with weighting, but n is the actual number of the responses (the same hereinafter).
3: Composition ratios may not add up to 100% due to rounding to the first decimal place (the same hereinafter).。

Figure-1 Number of Staff Members

Figure-2 Annual Sales



Note: Average value is not calculable because the questions were asked by category.

million yen" is 22.6%; "from 100 million to under 500 million yen" is 27.0%; and "500 million yen or more" is 15.2% (Figure-2). The average value is not calculable because questions were asked by category, but the median is "from 50 million to under 100 million yen."

Figure-3 Business Conditions

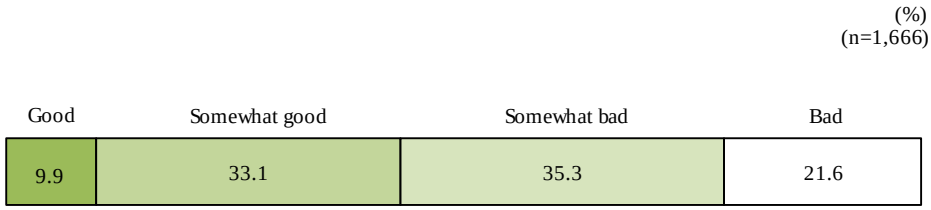
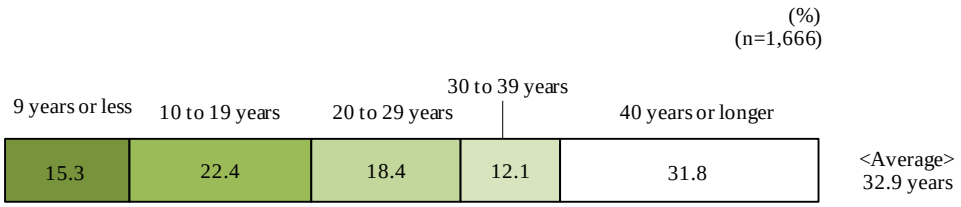


Figure-4 Years in Business



Note: Years in business are calculated by subtracting the year of establishment from 2022 when the survey was conducted.

When asked about the impact of the COVID-19 pandemic on sales, 58.4% of the respondents (total of "very negative impact" (33.0%) and "somewhat negative impact" (25.4%)) answered that it had a negative impact.[7] Perhaps for this reason, as to the sales at the time of the survey, "increasing" was 19.2%, which is greatly lower than 37.8% of "decreasing," while "mostly flat" was 43.1%.

As regards business conditions, "good" is 9.9%, "somewhat good" is 33.1%, "somewhat bad" is 35.3%, and "bad" is 21.6% (Figure-3). The DI obtained by subtracting the ratio of "somewhat bad" and "bad" from the ratio of "good" and "somewhat good" is negative, at -13.9. However, in the 2022 Jul-Sep quarter "Survey on SME Trends" implemented by the institute, the business outlook DI of small enterprises with "5-9" staff members and those with "10-19" staff members are -25.2 and -15.4, respectively, while the same of SMEs is 5.5. It is presumed that there is no significant bias considering the distribution of the number of staff members of this survey's samples.[8]

Average years in business was 32.9 (Figure-4).[9] It is widely distributed with "9 years or less" at 15.3%, "10 to 19 years" at 22.4%, "20 to 29 years" at 18.4%, "30 to 39 years" at 12.1% and "40 years or longer" at 31.8%. As to the legal status of the business at the time of the survey, private enterprises accounted for 28.3%, while corporations including stock companies were 71.7%.

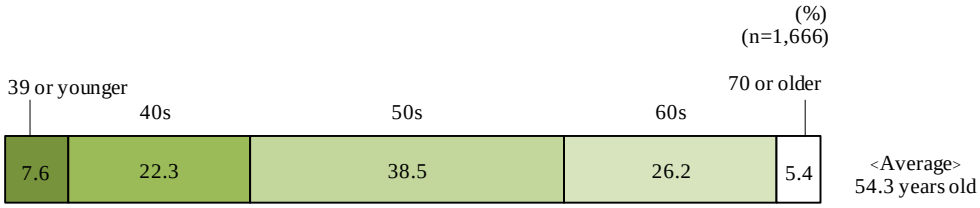
Lastly, as to age distribution of the CEO of the responding enterprises, the proportion of "39 and younger" is 7.6%, "40s" is 22.3%, "50s" is 38.5%, "60s" is 26.2% and "70 or older" is 5.4%. Average age is 54.3

[7] On the other hand, 14.5% combining "very positive impact" (3.7%) and "somewhat positive impact" (10.8%) answered that the COVID-19 pandemic had positive effects on sales. The ratio of "cannot say" was 27.1%.

[8] Samples of the "Survey on SME Trends" of the Institute are small enterprises with less than 20 staff members for the small enterprise part and SMEs with 20 or staff members (excluding the CEO) for the SME part.

[9] Because years in business were not asked in the survey, these are calculated by subtracting the year of establishment from 2022, when the survey was conducted. For enterprises that were established as private business and later incorporated, the year of establishment of private business was used.

Figure-5 Age of the CEO



(Figure-5). This is slightly younger than 62.3, which is the average age of enterprise CEOs in Japan.[10] Contributing factors may include the smaller number of older respondents due to the use of an online survey and exclusion of enterprises with "1-4" staff members, the average CEO age of which is older. However, we assume that the difference has no significant impact on the survey results and proceed with the analysis as follows.[11] Incidentally, 90.7% of the CEOs were males and 9.3% were females.

In Section 1, we confirmed the procedures of the questionnaire survey and basic characteristics of the responding enterprises and CEOs. In the following Section 2 and after, we present the results of the survey of SMEs' efforts to reduce GHG, while making analysis as needed according to the characteristics of the enterprises and CEOs as presented in this section.

2 Initiative Implementation Status

(1) Ratio of the SMEs Implementing Initiatives

SMEs are expected to implement various initiatives contributing to GHG reduction. In Section 2, we look at the implementation status of individual initiative types by comparing the current state and the situation of three years ago. Here, "current" refers to August 2022, when the survey was conducted, while "three years ago" refers to August 2019, before the COVID-19 pandemic.[12]

The first question of the survey was about the implementation status of "overall" initiatives contributing to GHG reduction, which are implemented by individual enterprises.[13] Then, the survey focused on nine individual initiative types, the specific content of which is shown in Table-3.

First, let us look at the current implementation status. As to "overall" initiatives, the percentage of the "implementing" enterprises was 44.9%, combining "implementing to a great extent" (6.2%) and "implementing to some extent" (38.7%) (Figure-6), while 55.1% of the enterprises answered "hardly implementing."

Next, as to the ratio of the enterprises implementing individual initiative types, the highest percentage is

[10] As of January 2023. Values are calculated based on the enterprise information database of Teikoku Databank, Ltd.
[11] The average age of CEOs by number of staff members as calculated based on the enterprise information database of Teikoku Databank, Ltd. was 63.6 for "1-4 staff members" and 61.0 for "5-299 staff members" (as of January 2023).
[12] On the questionnaire screen, "three years ago (2019)" is displayed with a note of "The first COVID-19 patient was identified in January 2020" to make the time clearer.
[13] "Overall" refers to overall initiatives contributing to GHG reduction, and not the sum of individual initiative types. For this reason, the ratio of the companies implementing individual initiatives as described later may exceed the ratio of "overall."

Table-3 Initiatives Contributing to GHG Reduction

Overall		Overall initiatives contributing to GHG reduction
Individual initiative types	Energy conservation	Introduction of high efficiency equipment, heat insulation, power saving and improvement of logistical efficiency, etc.
	Use of renewable energy	Use of solar/wind/biomass power and wood boilers, bio fuels, etc.
	Reduction in the use of resources other than energy	Reduction in the use of paper, plastic and styrene foam, switching from plastic to paper, wood or bio plastic, etc.
	Recycling	Discharging paper, plastic, construction waste materials used by the company in a usable state, etc.
	Use of recycled products	Use of recycled paper, plastic, construction materials, etc.
	Introduction of next generation vehicles	Introduction of electric vehicles, fuel cell vehicles (excluding hybrid vehicles), etc.
	Reduction in the use of GHGs	Changing refrigerant/detergent and introducing equipment that uses less GHGs, etc.
	Reduction in movement of persons	Telework, remote conference and reduction in business trips, etc.
	Absorption of GHGs	Rooftop greening, tree planting, etc.

53.3% of "recycling," which refers to discharging paper, plastic, construction waste materials, etc. in a usable state. This is followed by "energy conservation" (50.7%), including the introduction of high efficiency equipment, heat insulation, power saving and improvement of logistical efficiency, and "use of recycled products" including construction materials (50.1%). These three types seem to be implemented by over half of the enterprises.

These are followed by "reduction in the use of resources other than energy" (46.9%), including reduction in the use of paper, plastic and styrene foam, and switching from plastic to paper, wood or bio plastic; "reduction in movement of persons" (36.7%), including telework, remote conference and reduction in business trips; "reduction in the use of GHGs" (32.2%), including changing the refrigerant in freezers, refrigerators, air conditioners, etc., changing detergents, and introducing equipment using less GHGs; "use of renewable energy," (30.1%) including use of solar/wind/biomass power, wood boiler, bio fuels, in this order.

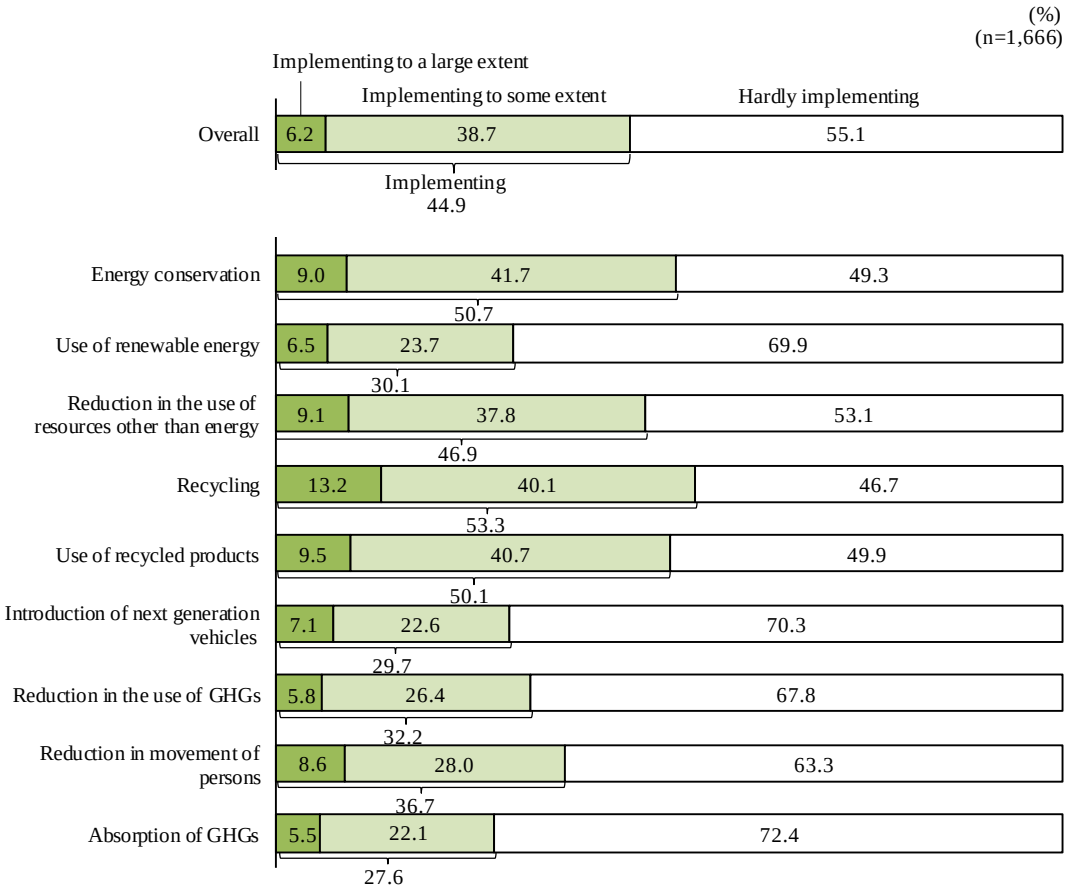
The ratio of "introduction of next generation vehicles," including electric vehicles and fuel cell vehicles (29.7%), was lower than that of other initiative types.[14] The ratio of "absorption of GHGs," including rooftop greening and tree planting is also relatively low at 27.6%.

As to "overall" implementation status three years ago, the percentage of the implementing enterprises was 41.9%, combining "Implementing to a large extent" (7.2%) and "Implementing to some extent" (34.7%) (Figure-7).[15] As described earlier, the percentage of the currently implementing enterprises is 44.9%. The

[14] Here, next-generation vehicles do not include hybrid vehicles. Although the survey did not ask about hybrid vehicles, the ratio of implementing enterprises would have been higher if hybrid vehicles had been included.

[15] The data for three years ago are from 1,626 respondents excluding enterprises that started business within three years.

Figure-6 Initiative Implementation Status (Present)



Note 1: "Overall" refers to overall initiatives contributing to GHG reduction, and not the sum of individual initiative types (the same hereinafter)
2: "Implementing" is the sum of "implementing to a large extent" and "implementing to some extent"

number of implementing enterprises has increased, although only slightly.[16]

The ratios of the enterprises implementing individual initiative types three years ago were in the order of 55.8% of "recycling," 52.5% of "energy conservation" and 51.2% of "use of recycled products. The order is the same as that of the current state, but the percentage was a little higher.

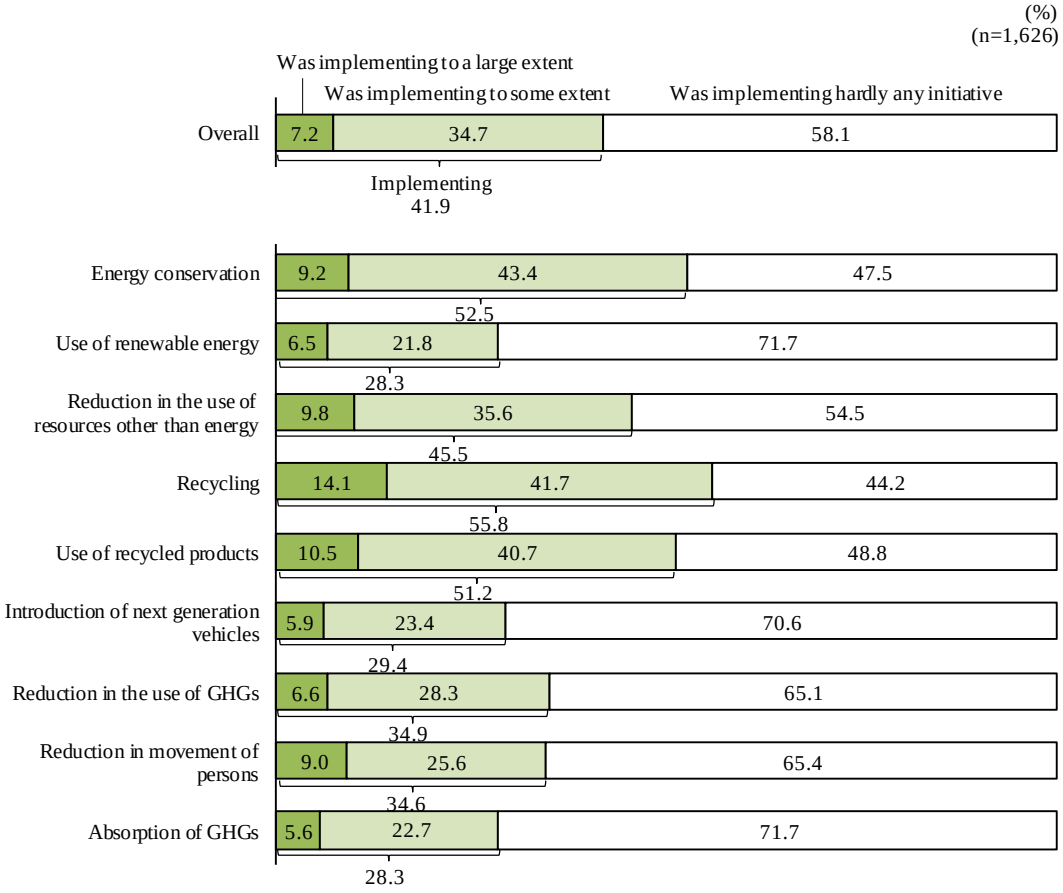
The ratio of implementing enterprises has increased only in four of the nine initiative types: "Use of renewable energy" (from 28.3% three years ago to current 30.1%), "Reduction in the use of resources other than energy" (from 45.5% to 46.9%), "Introduction of next-generation vehicles" (from 29.4% to 29.7%) and "Reduction in movement of persons" (from 34.6% to 36.7%).[17] Ratios of the enterprises implementing the remaining five have declined. Not necessarily all initiative types may be progressing at the same pace.[18]

[16] The ratio of the enterprises implementing "overall" initiatives among 1,626 respondents excluding enterprises that started business within three years was 45.2%, which is much the same with 44.9% of the 1,666 enterprises without the exclusion. For this reason, the text shows the current data of 1,666 respondents in Figure-6.

[17] Change in "Reduction in movement of persons" may be influenced by the increase in the number of enterprises introducing telework and remote conference in response to the COVID-19 pandemic.

[18] A comparison of the current rate of the implementing enterprises excluding those starting business within three years with the ratio three years ago also showed that the ratio increased for four initiative types, while the ratio decreased for the other five initiative types. No difference was found in the trends.

Figure-7 Initiative Implementation Status (Three Years Ago)



Note 1: "Implementing" is the sum of "was implementing to a large extent" and "was implementing to some extent"
2: Enterprises started business within three years ago are excluded from the samples of "three years ago" (the same he reinafter)

(2) Ratio of Implementing Enterprises by Industry Type

Let us look at the ratio of implementing enterprises by industry type. First, as to "overall" initiatives, "Wholesale" (53.9%), "Manufacturing" (49.5%), "Retail trade" (48.1%), "Information and Communications" (46.1%), "Education, Learning support" (45.9%) and "Services" (45.2%) exceeded the ratio of "All industries" (Table-4).[19] The ratio of the implementing enterprises is lower in "Other" (32.4%), "Restaurant and Accommodations" (39.3%), and "Medical, Health care and Welfare" (39.9%).

As to the ratio of the enterprises implementing individual initiative types, in the wholesale industry, which has the highest ratio for "overall" initiatives, "Energy conservation" (59.6%) is implemented by the largest number of enterprises, followed by "recycling" at 55.6% and "reduction in movement of persons" at 54.7%. Perhaps due to the characteristics of the industry type, the results show progress in the recycling of packaging materials, working from home, business negotiation via the internet, etc. in addition to energy conservation in offices and warehouses.

[19] Table-4 uses two-level shading for "50% and more" and "40 to under 50%." This is for the purpose of clearly showing the difference in ratios and does not indicate any special meaning in the borderline figures. The same applies to the following tables.

Table-4 Ratio of the Implementing Enterprises (at Present, by Industry)

(%)

	Construction	Manufacturing	Information and Communications	Transportation	Wholesale	Retail trade	Restaurant and Accomodations	Medical, Health care and Welfare	Education, Learning support	Services	Real estate	Other	Total of all industries
Overall	43.4	49.5	46.1	42.9	53.9	48.1	39.3	39.9	45.9	45.2	40.5	32.4	44.9
Energy conservation	47.6	54.8	44.8	49.0	59.6	55.1	51.0	47.2	42.6	48.5	51.4	32.0	50.7
Use of renewable energy	34.4	31.0	25.2	30.1	34.3	34.2	23.0	29.2	24.6	28.5	30.0	22.2	30.1
Reduction in the use of resources other than energy	43.7	50.8	43.3	36.9	48.1	54.4	49.4	44.4	43.3	44.7	33.7	41.0	46.9
Recycling	51.6	60.0	53.3	47.6	55.6	56.6	51.0	45.8	51.5	57.2	39.3	45.1	53.3
Use of recycled products	50.2	47.8	53.7	40.8	53.8	60.6	50.8	43.0	45.9	51.8	42.1	43.3	50.1
Introduction of next generation vehicles	32.9	26.2	30.2	29.8	42.5	30.4	27.6	24.2	24.8	29.7	27.8	30.5	29.7
Reduction in the use of GHGs	32.4	34.8	32.3	32.0	38.4	31.6	29.0	28.7	28.2	31.8	30.6	41.8	32.2
Reduction in movement of persons	34.7	37.6	64.7	26.1	54.7	31.4	28.0	29.6	40.5	41.7	41.1	51.1	36.7
Absorption of GHGs	28.1	29.5	29.6	23.2	32.0	24.1	25.8	24.9	27.7	29.6	34.3	28.7	27.6
n	271	262	112	114	95	141	111	134	70	279	37	40	1,666

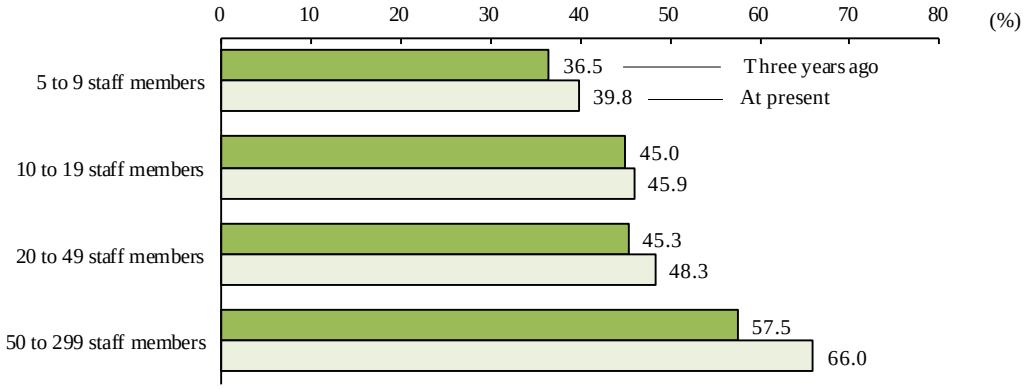
Note 1: The ratio of implementing enterprises is the sum of "implementing to a large extent" and "implementing to some extent"
2: We used dark shading for "50% and more" and light shading for "40 to under 50%"

In the manufacturing industry, which has the second highest ratio for "overall" initiatives, the order is "recycling" (60.0%), "energy conservation" (54.8%) and "reduction in the use of resources other than energy" (50.8%). It is thought that energy conservation had progressed earlier in manufacturing, which uses more energy than other industries in many cases. Recycling of waste from the production stage, reduction in the use of resources other than energy by downsizing products and simplifying packaging seem to be more active compared with other industries.

In Retail trade, which holds the third place, the ratios of "use of recycled products" (60.6%), "recycling" (56.6%) and "energy conservation" (55.1%) are high. This indicates that their efforts include changing packaging to recyclable materials and simplifying packaging.

In Information and Communications, which holds the fourth place, "reduction in movement of persons" is remarkably high, at 64.7%. It is thought that use of the internet is more advanced compared with other industry types because the industry has programming and many jobs that can be done alone at home.

Figure-8 Ratio of the Implementing Enterprises
(Overall Initiatives, by Number of Staff Members)



Note 1: The ratio of the implementing enterprises is the sum of "implementing to a large extent" and "implementing to some extent" or the sum of "was implementing to a large extent" and "was implementing to some extent" (the same hereinafter)
2: n is omitted (the same up to Figure-13 excluding Figure-11).
3: The numbers of employees are the current values.

Various initiatives are implemented in other industry types as well. The ratio of the implementing enterprises is high especially for "energy conservation," "recycling" and "use of recycled products."

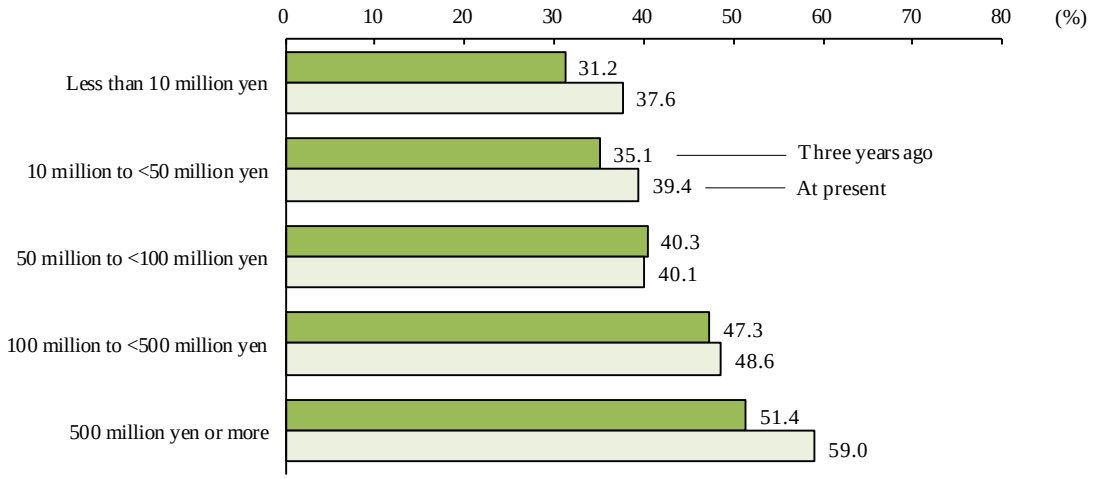
(3) Enterprise Characteristics and Ratio of Implementing enterprises

Let us look at the relationship between enterprise characteristics other than industry type and the ratio of the implementing enterprises. First, by number of staff members, the ratio of the implementing enterprises with "50 to 299" staff members three years ago and currently is 57.5% and 66.0% respectively; 45.3% and 48.3% respectively for enterprises with "20 to 49 staff members; 45.0% and 45.9% for enterprises with "10 to 19" staff members; and 36.5% and 39.8% for enterprises with "5 to 9" staff members. The results show that initiatives have progressed more in enterprises with a larger number of staff members (Figure-8). Enterprises with "50 to 299" staff members have a ratio far ahead of other enterprises, by 8.5 points in the three years. Enterprises with "5 to 9" staff members follow, with a 3.3 point increase. In the three years, the level of the ratio of the implementing enterprises increased among small enterprises, while the gap due to company size tended to widen.[20]

By yearly sales, the ratio of the implementing enterprises 3 years ago and present is 51.4% and 59.0%, respectively, with the "500 million yen or more" bracket; 47.3% and 48.6% with the "100 million to under 500 million yen" bracket; and 40.3% and 40.1% with the "50 million to under 100 million yen" bracket. Here again, the ratio is higher among larger-scale enterprises (Figure-9). As to the increase during the three years, 7.6 points of the "500 million yen or more" bracket is highest, followed by 6.4 points of "under 10 million yen." Here again, the level of small enterprises rose, while the gap due to company size widened.

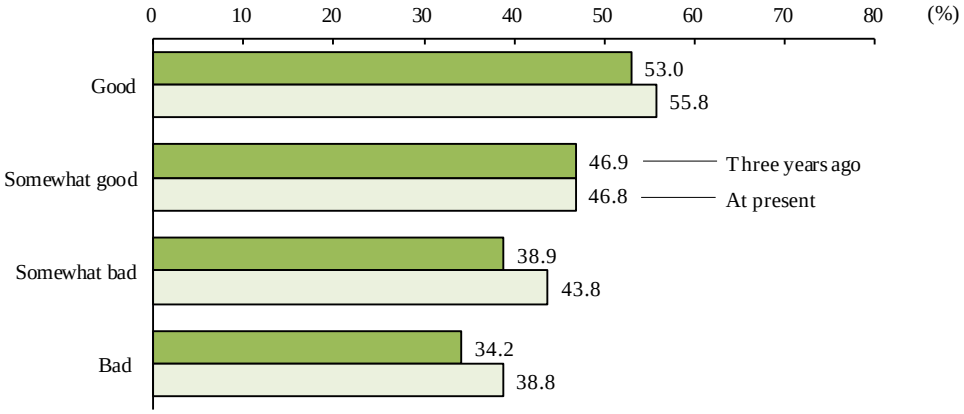
[20] Comparison of the result of excluding the enterprises that had started business within 3 years with the result of not excluding them did not show a difference in the changing trends of the ratio. The same applies to the data of Figures -9, -10, -12 and -13.

Figure-9 Ratio of the Implementing Enterprises (Overall Initiatives, by Sales)



Note: Yearly turnover is the current value.

Figure-10 Ratio of the Implementing Enterprises (Overall Initiatives, by Business Conditions)



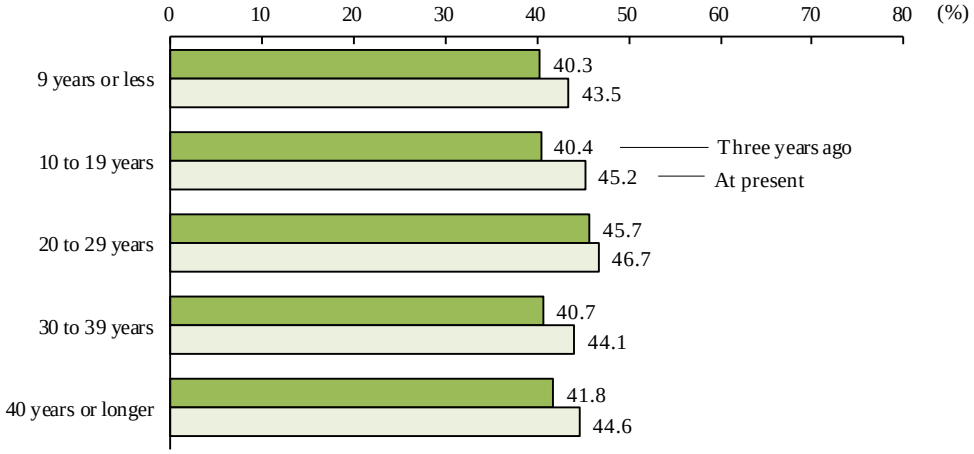
Note: Business conditions are the current situation.

As to ratio of the implementing enterprises by business condition, the ratio among the enterprises in "good" business conditions three years ago and current is 53.0% and 55.8%, respectively; 46.9% and 46.8% among the enterprises in "slightly good" conditions; 38.9% and 43.8% among the enterprises in "slightly bad" conditions; and 34.2% and 38.8% among the enterprises in "bad" conditions." The better the business conditions, the higher the ratio (Figure-10). However, while "good" increased 2.8 points and "slightly good" decreased 0.1 points compared with three years ago, "bad" and "slightly bad" increased 4.6 points and 4.9 points respectively. The difference in the ratio of the implementing enterprises due to a difference in business conditions seems to have slightly decreased.

Conversely, as to business conditions by implementation status, the ratio of the enterprises in "good" business conditions is 28.8% among the enterprises "implementing to a great extent," 9.7% among the

Figure-11 Business Conditions by Implementation State (Overall Initiatives, at Present)

Figure-12 Ratio of the Implementing Enterprises (Overall Initiatives, by Years in Business)



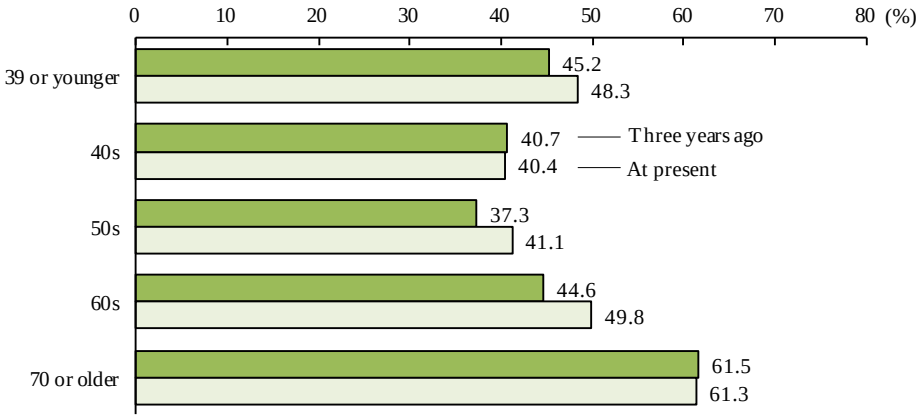
Note: Years in business are the current value.

enterprises “implementing to some extent,” and 8.0% among the enterprises “hardly implementing,” while the ratio of the enterprises in “bad” conditions is 17.0%, 18.9% and 24.0% respectively (Figure-11). Enterprises that are more actively implementing initiatives toward GHG reduction tend to be in better business conditions.

In this way, the business conditions and the ratio of implementing enterprises seem to corelate positively. However, it requires attention that we cannot clearly say whether enterprises in good business conditions could afford to actively implement initiatives, or that implementing the initiatives contributed to the improvement of business conditions.

At the conclusion of the characteristics section, let us look at the impact of years in business and age of the CEO on the implementation status. First, the ratio of the implementing enterprises three years ago and at present by years in business is: 40.3% and 43.5% respectively for the “9 years or less” bracket; 40.4% and 45.2% respectively for the “10 to 19 years” bracket; and 45.7% and 46.7% respectively for the “20 to 29 years” bracket (Figure-12). No clear difference in implementation status due to years in business was

Figure-13 Ratio of the Implementing Enterprises (Overall Initiatives, by Age of the CEO)



Note: Age of manager is the current value.

observed: neither old companies nor startups are ahead of others.

By age of the CEO, the ratio of the implementing enterprises with the "70 or older" CEO is conspicuously high, at 61.5% three years ago and 61.3% at present (Figure-13), followed by "39 or younger" (45.2% and 48.3%) and "60s" (44.6% and 49.8%) at almost the same level. The levels of "40s" (40.7% and 40.4%) and "50s" (37.3% and 41.1%) are relatively low. While we could say that younger CEOs are sensitive to environmental issues, aged CEOs are even more actively working to reduce GHGs.

3 Perceived Progress in Comparison with Other Companies in the Same Business

(1) Progress of Initiatives

In Section 2, we looked at the ratio of implementing enterprises, which may be considered at the absolute level. In Section 3, we look at a relative index, namely the present progress of their initiatives in comparison with other companies in the same business.[21]

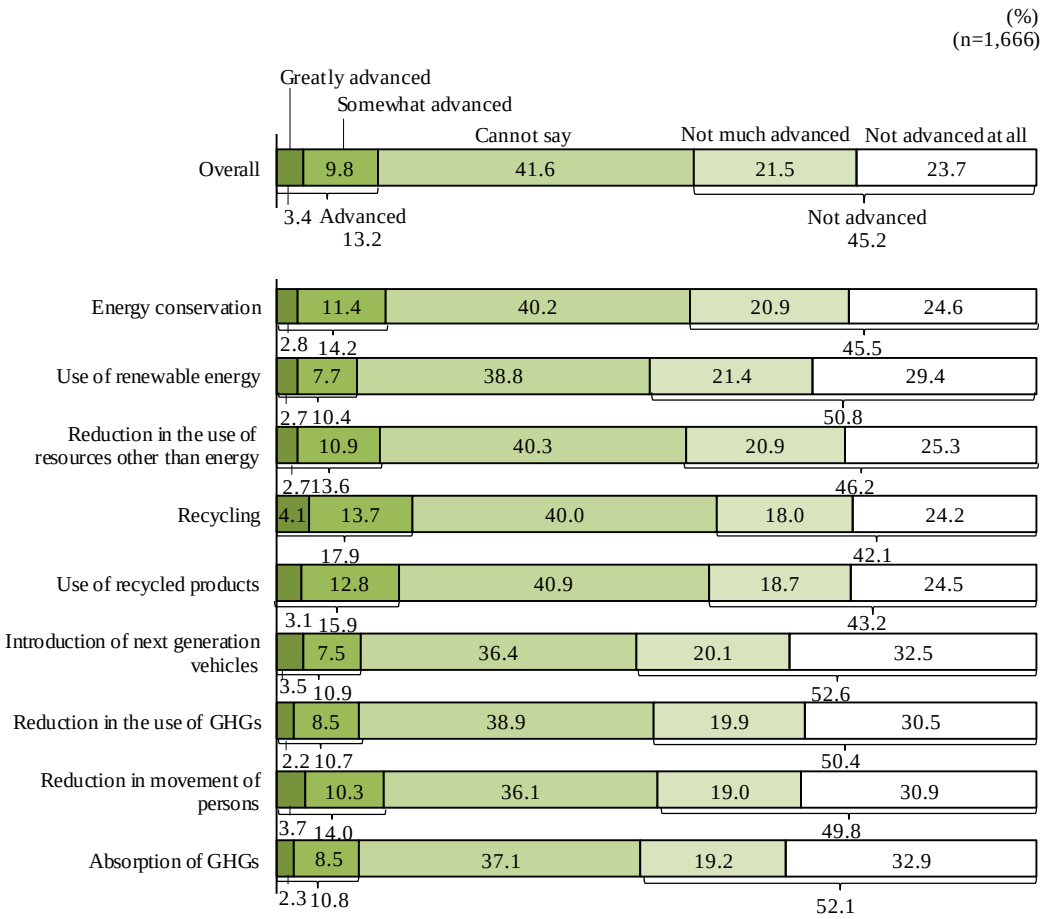
As to "overall" initiatives contributing to GHG reduction, the ratio of enterprises answering that they are more "advanced" compared with other companies in the same business is only 13.2% (the sum of "greatly advanced" (3.4%) and "somewhat advanced" (9.8%) (Figure-14). The ratio of "neither good nor bad" is 41.6%. The ratio of "not advanced" enterprises is 45.2% (sum of "not much advanced" (21.5%) and "not advanced at all" (23.7%)).

As to "overall" initiatives, the ratio of the enterprises answering "advanced" is higher than the 6.2% of the enterprises "implementing to a great extent" shown in Section 2, but considerably lower compared with 44.9% with addition of the enterprises "implementing to some extent" (38.7%).

By individual initiative types, the ratio of the "advanced" enterprises is highest for "recycling," at 17.9%,

[21] All data used in Section 3 and after are on the situation at the time of the survey, because we have not obtained information on the situation three years ago.

Figure-14 Progress in Comparison with Other Companies in the Same Business



Note: "Advanced" is the sum of "Greatly advanced" and "Somewhat advanced," while "not advanced" is the sum of "Not much advanced" and "Not advanced at all" (the same hereinafter).

followed by "use of recycled products," at 15.9%, "energy conservation," at 14.2% and "reduction in movement of persons," at 14.0%. The ratio of the "advanced" enterprises is low in "use of renewable energy," at 10.4%, "reduction in the use of GHGs," at 10.7% and "absorption of GHGs," at 10.8%, in this order. Compared with the ratio of the implementing enterprises (Previous Figure-6), mostly the same initiative types are in the top and bottom groups, though in a slightly different order.

(2) Progress by Industry Type

Looking at the progress of initiatives contributing to GHG reduction by industry type, the ratio of the enterprises answering they are "advanced" in "overall" initiatives in comparison with other companies in the same business is high in "Wholesale" (18.9%), "Real estate" (16.3%), "Education, Learning support" (15.6%) and "Retail trade" (15.4%), in this order (Table-5). The ratio of the enterprises answering "advanced" is less than 10% among "Other" (6.7%), "Transportation" (9.8%) and "Construction" (9.9%).

Next, let us look at the situation of individual initiative types by industry type. "Recycling," which has

Table-5 Ratio of the Advanced Enterprises (at Present, by Industry type)

(%)

	Construction	Manufacturing	Information and Communications	Transportation	Wholesale	Retail trade	Restaurant and Accomodations	Medical, Health care and Welfare	Education, Learning support	Services	Real estate	Other	Total of all industries
Overall	9.9	13.2	13.2	9.8	18.9	15.4	13.4	13.9	15.6	11.2	16.3	6.7	13.2
Energy conservation	11.3	15.8	14.3	12.5	22.0	14.4	12.0	15.7	15.3	11.9	16.3	9.0	14.2
Use of renewable energy	12.0	10.6	10.3	9.2	7.3	12.0	8.7	13.6	5.7	7.6	20.5	6.7	10.4
Reduction in the use of resources other than energy	10.4	15.1	13.3	11.8	15.0	15.2	17.9	14.1	15.3	8.7	14.6	13.7	13.6
Recycling	16.6	20.5	17.0	16.9	23.7	18.5	14.9	17.4	23.2	14.1	23.6	18.9	17.9
Use of recycled products	12.9	17.8	16.9	15.5	21.8	17.8	12.1	17.8	19.6	13.0	18.3	11.7	15.9
Introduction of next generation vehicles	9.7	9.0	12.1	12.7	10.6	11.2	10.7	14.2	8.3	10.5	12.3	13.5	10.9
Reduction in the use of GHGs	9.0	12.2	10.3	10.7	12.1	14.8	8.6	12.0	7.2	7.6	14.6	7.2	10.7
Reduction in movement of persons	12.4	11.3	34.3	8.3	24.2	12.6	12.3	9.5	23.1	15.5	19.9	18.9	14.0
Absorption of GHGs	9.1	10.9	11.0	10.5	13.4	8.3	14.2	13.2	9.8	7.1	18.3	11.3	10.8
n	271	262	112	114	95	141	111	134	70	279	37	40	1,666

Note: We used dark shading for "20% and more" and light shading for "15 to under 20%"

the highest rate of "advanced" enterprises among individual initiative types, is relatively advanced in many industry types. In particular, the rate of the "advanced" enterprises is over 20% in Wholesale (23.7%), Real estate (23.6%), Education, Learning support (23.2%), and Manufacturing (20.5%). Ratio of "use of recycled products," which is second highest among individual initiative types, is over 15% for almost all industry types and is highest for wholesale, at 21.8%. Wholesale (22.0%) ranks first also in "energy conservation," followed by over 15% of other four industry types.

The highest ratio both by initiative type and industry type is 34.3% of "reduction in movement of persons" of Information and Communications. The ratio of this initiative is relatively high also in Wholesale (24.2%) and Education, Learning support (23.1%). It may be because it is easier for these industries to use the internet, as described in Section 2.

Above, we have looked at perceived progress in comparison with other companies in the same business from the aspects of individual initiative and industry types. The overall level is lower but the trends do not show a significant difference from the ratio of the implementing enterprises observed in Section 2.

Figure-15 Ratio of Advanced Enterprises (Overall Initiatives; by Number of Staff Members)

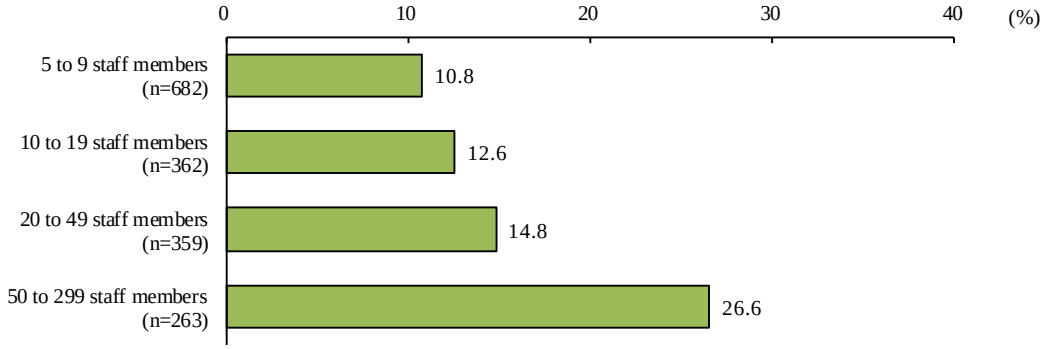
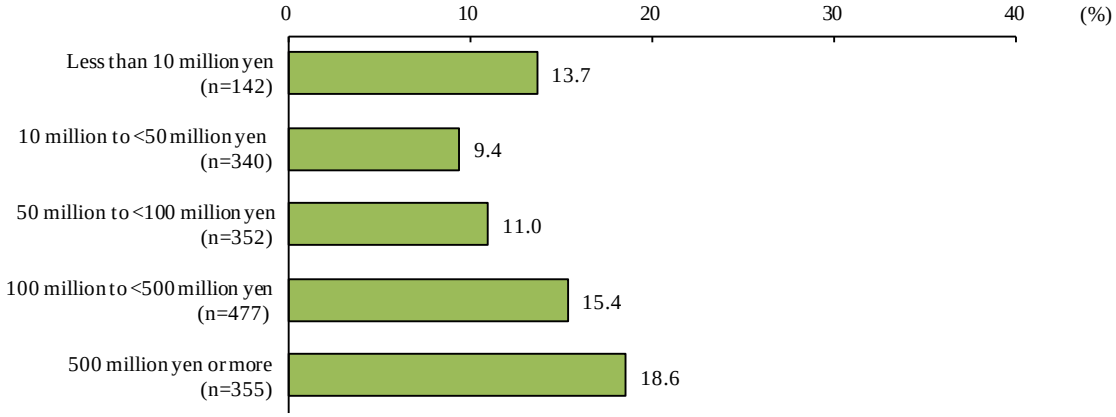


Figure-16 Ratio of Advanced Enterprises (Overall Initiatives; by Sales)



(3) Corporate Characteristics and Perceived Progress

Next, let us look at the progress of initiatives by corporate characteristics. First, the ratio of enterprises "advanced" in initiatives by number of staff members is: 26.6% of the enterprises with "50 to 299" staff members; 14.8% of the enterprises with "20 to 49"; 12.6% of the enterprises with "10 to 19"; and 10.8% of the enterprises with "5 to 9" staff members. Larger enterprises were more likely to answer that their initiatives are advanced (Figure-15).

By yearly sales, the ratio is 18.6% for the "500 million yen or more" bracket, 15.4% for the "100 million to under 500 million yen" bracket, 11.0% for the "50 million to under 100 million yen" bracket, and 9.4% for the "10 million to under 50 million yen" bracket. Though the ratio is 13.7% for the "under 10 million yen" bracket, initiatives are generally advanced in larger enterprises, as is the case of the number of staff members (Figure-16).

The tendency that enterprises with larger business scale are making more progress in the initiatives compared with other companies in the same business corresponds to the tendency of the ratio of the implementing enterprises, which was explored in Section 2.

Figure-17 Ratio of Advanced Enterprises (Overall Initiatives; by Business Conditions)

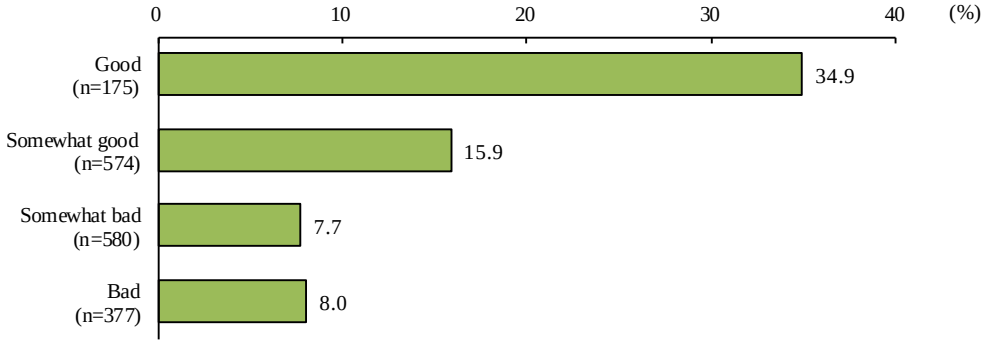
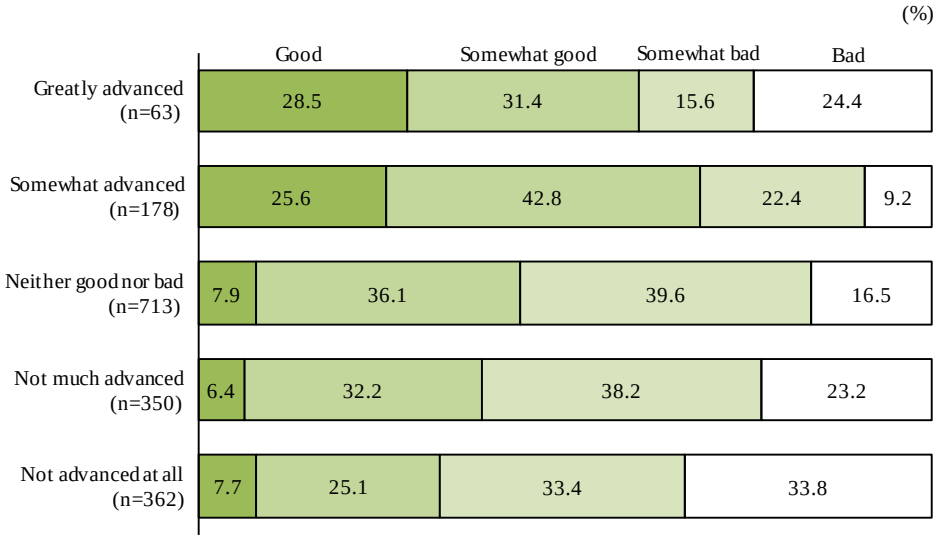


Figure-18 Business Conditions by Progress (Overall Initiatives)



As to business conditions, the ratio of the "advanced" enterprises among the enterprises in "good conditions" is 34.9%, which is considerably higher than the 15.9% of the enterprises in "somewhat good" conditions (Figure-17). The ratio is 7.7% for the enterprises in "somewhat bad" and 8.0% for the enterprises in "bad" conditions. It seems that enterprises in better business conditions are making more progress in the initiatives, as is the case of the ratio of the implementing enterprises.

Conversely, when looking at business conditions by progress of the initiatives, 28.5% of the "greatly advanced" enterprises, 25.6% of the "somewhat advanced" enterprises, and 7.9% of the "neither good nor bad" enterprises are in "good" business conditions. Enterprises making more progress tend to be in better business conditions (Figure-18). The ratio for "not much advanced" (6.4%) and "not advanced at all" (7.7%) are on the same level as "neither good nor bad." The ratio of "bad" conditions is higher for the "greatly advanced" enterprises, at 24.4%, compared with the "somewhat advanced" enterprises, at 9.2%. Otherwise, however, the ratio is 16.5% for "neither good nor bad," 23.2% for "not much advanced" and 33.8% for "not advanced at all": business conditions tend to be worse with enterprises where initiatives are not progressing.

Figure-19 Ratio of Advanced Enterprises (Overall Initiatives; by Years in Business)

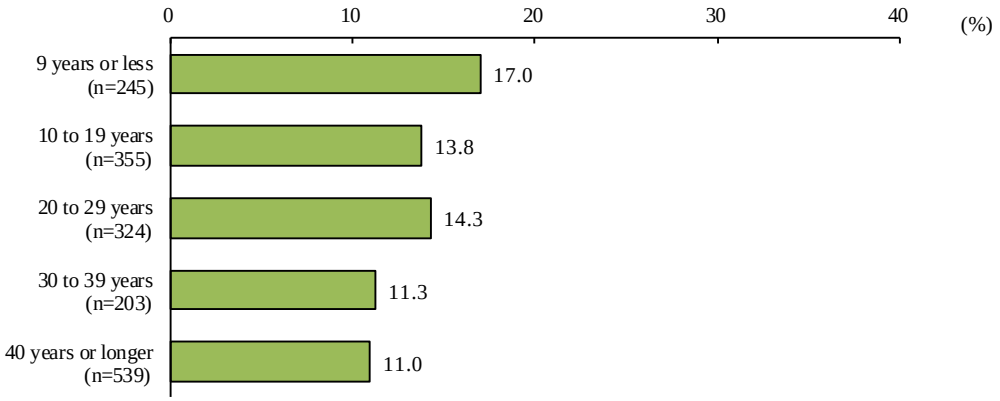
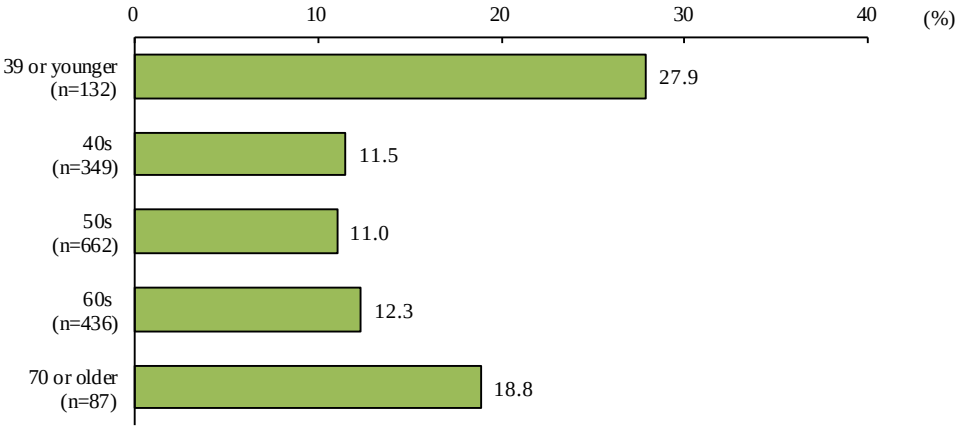


Figure-20 Ratio of Advanced Enterprises (Overall Initiatives; by Age of the CEO)



Overall, the progress of initiatives and business conditions seem to positively corelate as is the case of implementation status explored in Section 2.[22]

Next, by years in business, the ratio is 17.0% for "9 years or less," 13.8% for "10 to 19 years," 14.3% for "20 to 29 years," 11.3% for "30 to 39 years" and 11.0% for "40 years or more." It is found that enterprises with longer years in business tend to think that their progress is slower compared with other companies in the same business (Figure-19).

The ratio of the "advanced" enterprises by age of the CEO is 27.9% with "39 or younger" CEOs, 11.5% with "40s," 11.0% with "50s," 12.3% with "60s" and 18.8% with "70 or older" CEOs. As is the case of the ratio of the implementing enterprises, the ratio is higher for young CEOs and aged CEOs (Figure-20). However, unlike the ratio of the implementing enterprises, which is higher with "70 or older" compared with "39 or younger," here, the ratio of "39 or younger" is higher than the ratio of "70 or older."

[22] As suggested regarding the relationship between the ratio of implementing enterprises and business conditions, it requires attention that we cannot clearly say whether progress of the initiatives contributed to the improvement of their business conditions or enterprises could advance the initiatives because they were in good business conditions.

4 Reason for Implementing the Initiatives and Impacts on the Business Management

(1) Reasons for Implementing the Initiatives

In Sections 2 and 3, we observed to what extent SMEs are implementing initiatives contributing to GHG reduction. Section 4 will focus on the enterprises currently implementing the initiatives and look at their reasons for the implementation and the impacts on their business management.[23]

First, to the question asking for the reason of implementing initiatives contributing to GHG reduction, "this is corporate responsibility" (25.4%) and "this is required by society" (24.2%), which are reasons that do not necessarily contribute to performance improvement of the enterprise, held the 1st and 2nd places (Table-6).[24] "to reduce costs," which may contribute to improvement of balance, held the 3rd place, at 20.6%. However, the ratio of "to gain new business opportunities" (5.1%) and "to increase sales" (4.8%), which may also promise increase in income and profit, is not high. Cases of reluctantly implementing due to external factors including "requested from outside" (5.8%) and "this is legally mandated" (4.5%) are unexpectedly few. "No special reason" was chosen by 22.1% of the enterprises.

Next, the survey asked the reason for implementing individual initiative types. The top three reasons: "this is corporate responsibility," "this is required by society," and "to reduce costs" were in the top 3 of all initiative types, though in varying orders.

However, for all nine initiative types, the ratios of "this is corporate responsibility" and "this is required by society" are lower than the "overall" ratio. On the other hand, the ratio of "to reduce costs," which held the 3rd place on "overall" initiatives is by far the highest (28.1%) in "energy conservation." The ratio of "to reduce costs" is higher than the 20.6% of "overall" initiatives for four initiative types: "recycling" (23.9%), "reduction in the use of resources other than energy" (22.0%), "use of recycled products" (21.6%) in addition to "energy conservation." The ratio for "reduction in movement of persons" (20.6%) was the same as the "overall" ratio.

In the overall direction of implementing initiatives contributing to GHG reduction, enterprises are somewhat strongly aware of the company's role in society. In individual initiatives, however, they tend to focus more on effects to improve profits through cost reduction. On the other hand, the ratios of "to reduce costs" for "GHG absorption" (14.9%), "reduction in the use of GHGs" (16.0%)," introduction of next-generation vehicles" (17.3%), and "use of renewable energy" (17.5%) were lower than the ratio of "overall" initiatives. These initiatives may be seen as not having large cost reduction effects or rather as increasing costs.

As to other reasons, "to improve corporate image" held the 4th place for "energy conservation" (5.7%),

[23] Analysis targets are the enterprises answering currently "implementing to a great extent" or "implementing to some extent." For this reason, the number of responses (n) varies depending on the initiative type.

[24] Up to three most applicable multiple answers. However, respondents who chose "no special reason" were not allowed to choose any other choices.

Table-6 Reasons for Implementing the Initiatives
(Implementing Enterprises; Multiple Answers Up to Three)

(%)

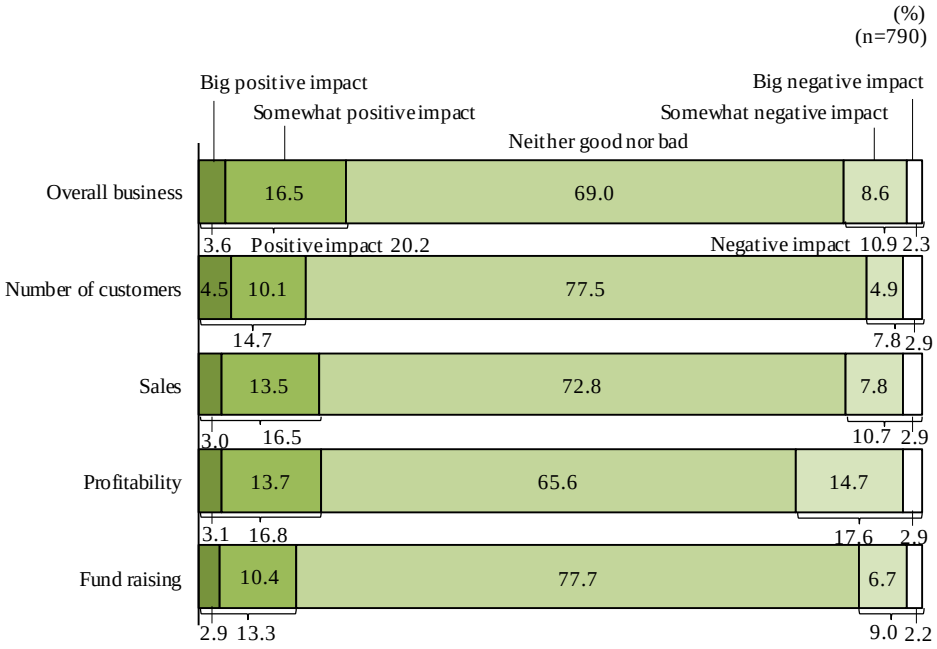
	This is corporate responsibility	This is required by society	To reduce costs	To improve corporate image	Requested from outside	To gain new business opportunities	To increase sales	This is legally mandated	To use subsidies/tax incentive	To help fund raising	Other	No special reason	n
Overall	25.4	24.2	20.6	8.1	5.8	5.1	4.8	4.5	4.2	4.0	2.5	22.1	790
Energy conservation	19.5	18.1	28.1	5.7	3.7	5.3	3.5	3.5	5.1	4.3	1.8	25.6	864
Use of renewable energy	14.4	17.1	17.5	8.3	5.5	4.2	4.6	4.5	6.2	7.6	4.8	25.8	527
Reduction in the use of resources other than energy	20.8	23.1	22.0	7.5	4.3	3.3	4.0	4.0	4.5	5.1	4.2	23.9	793
Recycling	21.0	22.7	23.9	5.3	5.4	5.4	4.4	4.8	3.3	3.4	3.6	23.0	917
Use of recycled products	22.7	22.3	21.6	6.9	4.3	4.9	5.2	4.5	3.4	4.3	4.3	21.5	854
Introduction of next generation vehicles	17.6	17.0	17.3	7.6	7.7	4.7	5.5	3.6	7.2	9.0	4.2	20.9	524
Reduction in the use of GHGs	20.6	20.9	16.0	7.8	6.6	6.5	4.7	4.0	4.5	6.3	3.5	22.3	580
Reduction in movement of persons	17.9	22.3	20.6	5.9	8.8	5.9	3.4	3.2	5.2	5.9	6.9	21.4	690
Absorption of GHGs	18.9	17.3	14.9	8.4	6.7	5.8	4.1	5.2	4.8	9.2	4.1	22.9	490

Note 1: Enterprises that answered currently "implementing to a great extent" or "implementing to some extent" individual initiative types were asked the question.
2: We used dark shading for "20% and more" and light shading for "15 to under 20%"

"use of renewable energy" (8.3%), "reduction in the use of resources other than energy" (7.5%), "use of recycled products" (6.9%) and "reduction in the use of GHGs" (7.8%) as well as in "overall" initiatives. However, the 4th place was held by: "requested from outside" and "to gain new business opportunities," both at 5.4%, for "recycling"; "requested from outside" (8.8%) for "reduction in movement of persons"; "to help fund raising" for "introduction of next-generation vehicles" (9.0%), and "GHG absorption" (9.2%), exceeding the ratio of "to improve corporate image"

In this way, "this is corporate responsibility," "this is required by society," and "to reduce costs" are seen as important reasons for implementing initiatives to reduce GHG, but the level of importance varies depending on the initiative type.

Figure-21 Impact of the Initiatives (Overall Initiatives; on Implementing Enterprises)



Note 1: Enterprises that answered they were "implementing to a great extent" or "implementing to a certain extent" overall in itiatives were asked the question.
2: "Positive impact" is the sum of "big positive impact" and "somewhat positive," while "negative impact" is the sum of "big negative impact" and "somewhat negative impact."

(2) Impact of the Initiatives

Next, how do the initiatives to reduce GHGs influence the business management? Was the impact positive or negative? We look at their impact on overall business, number of customers, sales, profitability and financing.

First, to the question about the impact of "overall" initiatives to reduce GHGs, the top answer was "neither good nor bad" at 69.0% (Figure-21).[25] The ratio of the enterprises experiencing "positive impact," at 20.2% combining 3.6% of "big positive impact" and 16.5% of "somewhat positive impact," might not be high. However, the ratio of the enterprises experiencing "negative impact," at 10.9% combining 2.3% of "big negative impact" and 8.6% of "somewhat negative impact," is low – around half of the enterprises experienced a "positive impact."

By individual items, on the number of customers, "positive impact" was 14.7%, "neither good nor bad" was 77.5%, and "negative impact" was 7.8%. On sales, the ratios are 16.5%, 72.8% and 10.7%, respectively, on profitability, the ratios are 16.8%, 65.6% and 17.6%; and on fundraising, the ratios were 13.3%, 77.7% and 9.0%, respectively. Excluding profitability, enterprises experiencing a positive impact are minority but the ratio exceeds that of enterprises experiencing a negative impact, as is the case of overall business. As to profitability, the ratio of enterprises experiencing a negative impact was 17.6%, which is higher than the same

[25] The question was not asked about the 9 individual initiative types.

on overall business and the other 4 items. The ratio was higher than that of the enterprises experiencing a positive impact (16.8%).

Because the survey did not ask about the impacts of individual initiative types, we cannot say which initiative type had an impact on which item. However, as observed here, initiatives toward GHG reduction do not necessarily have a positive impact on business, but may have a negative impact in some cases. Particularly, there are more answers showing a negative impact on profitability than on other items. The fact may lower the incentive for individual enterprises to implement the initiatives.

Therefore, after introducing the SME CEOs' view of initiatives toward GHG reduction, Section 5 will discuss the challenges involved in the initiatives and a direction toward their solution.

5 Future Direction and Challenges

(1) View of the initiatives

To the question about CEOs' personal view of initiatives to reduce GHGs, combining 19.4% of "should be promoted even with a burden on individuals/enterprise" and 46.5% of "should be promoted unless it becomes a burden on individuals/enterprise," nearly 70% of the CEOs think that the initiatives should be promoted (Figure-22).[26] However, there are also respondents choosing "not necessary to promote too aggressively" (19.0%) or "don't know" (15.1%).

On the other hand, to the question about the company's plan for the three following years, "will promote even with a burden on management" is as low as 5.7%, whereas "will promote unless it becomes a burden on management" is as high as 65.1%. Combined, about 70% of the CEOs intend to promote the initiatives. This is about the same level as the personal views, but there is a considerable difference in judgements of burden. Many CEOs may think that the initiatives should be promoted, but may want to avoid negative impacts on actual business. In addition, the ratio of "no intention to promote actively" was 29.2%, which shows that a certain number of CEOs have little interest in working to reduce GHG in their company.

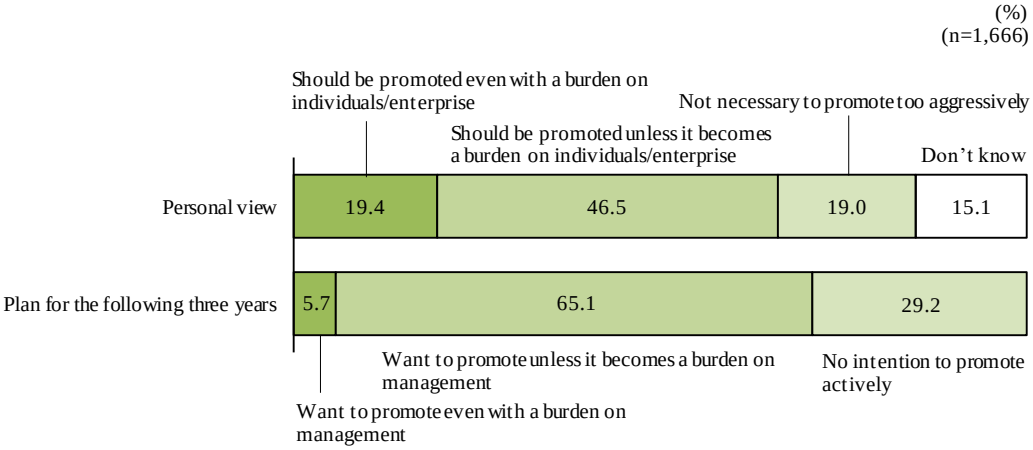
(2) Challenges Involved in the Initiatives

To the question about challenges for implementing the initiatives, the ratio of "cost increase" (23.0%) was highest for "overall" initiatives (Table-7).[27] The result is consistent with the data of Section 4, where the ratio of the enterprises experiencing negative impacts on profitability exceeded the ratio of those with positive impacts (Previous Figure-21). Another monetary challenge, "fund shortage" was chosen by 14.1% of the respondents.

There are also operational challenges, including "requires additional labor" (15.0%) and "lack of necessary knowhow and human resources" (9.8%); and informational challenges, including "don't know how

[26] Data of Section 5 (Figure-22, Table-7, Figure-23, Table-8) are results of asking all survey targets.
[27] Up to three most applicable multiple answers. However, respondents who chose "no special reason" were not allowed to choose any other choices.

Figure-22 View of the Initiatives



to implement" (13.2%) and "don't know whom to consult" (6.0%).

On the other hand, ratios of "cannot obtain cooperation of the staff members" and "cannot obtain the understanding of consumers/business partners" were as low as 3.3% and 3.1%, respectively: most enterprises do not have problems regarding cooperation or understanding of their stakeholders. "No special problem" was chosen by 33.5% of the respondents.

Ratio of "cost increase" is highest for all individual initiative types, though lower than 23.0% of "overall" initiatives.

However, the trend of the second place and lower is somewhat different, depending on the initiative type. First, for "energy conservation," "use of renewable energy," "introduction of next-generation vehicles" and "reduction in the use of GHGs," the second place was held by "lack of funds" at 14.4%, 13.6%, 14.5% and 13.8%, respectively. Regarding these four types, the ratio of "cost increase" is generally higher, at 19.6%, 22.8%, 22.0% and 18.2% compared with other five initiative types. It is believed that, because these initiatives require relatively large capital, many enterprises cite monetary challenges.

Next, regarding "reduction in the use of resources other than energy," "recycling" and "use of recycled products," "requires additional labor" is cited second most frequently, at 12.1%, 14.0% and 12.8% respectively. The difference with "cost increase" (18.1%, 16.8% and 18.3%) is small compared with other initiative types.

As regards "reduction in movement of persons" and "absorption of GHG," the first place is held by "cost increase," at 13.5% and 18.7%, respectively, followed by "don't know how to implement" (10.2% and 12.3%).

The ratio of "no special problem" was at the 30% level for all initiative types.

(3) Situation of Emissions Trading

Separately from the nine initiative types, this survey asked about the situation of GHG emissions trading. Let us describe the results here.

Table-7 Challenges for Implementing the Initiatives (Multiple Answers Up to Three)

(%)
(n=1,666)

	Cost increase	Requires additional labor	Fund shortage	Don't know how to implement	Lack of necessary knowhow and human resources	Don't know who to consult	Cannot obtain cooperation of the employees	Cannot obtain understanding of consumers/business partners	Other	No special problem
Overall	23.0	15.0	14.1	13.2	9.8	6.0	3.3	3.1	3.7	33.5
Energy conservation	19.6	12.1	14.4	11.2	8.7	5.4	4.0	2.9	3.4	35.4
Use of renewable energy	22.8	10.8	13.6	13.2	8.1	6.2	3.9	3.3	3.7	32.6
Reduction in the use of resources other than energy	18.1	12.1	11.7	11.3	9.6	5.6	4.3	3.1	4.2	36.6
Recycling	16.8	14.0	9.9	11.4	7.6	5.1	4.2	2.9	3.8	38.6
Use of recycled products	18.3	12.8	10.4	10.4	7.3	4.5	3.5	3.6	4.6	38.3
Introduction of next generation vehicles	22.0	8.8	14.5	10.7	6.6	5.0	3.7	1.9	4.4	35.1
Reduction in the use of GHGs	18.2	10.5	13.8	12.2	9.0	5.4	3.2	3.3	4.4	34.9
Reduction in movement of persons	13.5	9.2	9.4	10.2	7.6	5.6	4.9	4.8	8.2	39.4
Absorption of GHGs	18.7	10.8	11.3	12.3	8.3	5.8	2.6	2.8	6.3	35.5

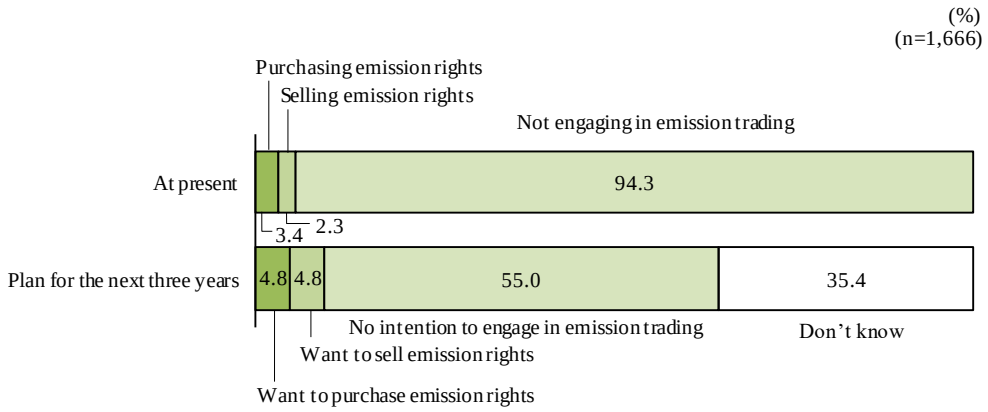
Note: We used dark shading for "20% and more" and light shading for "15 to under 20%"

Currently, enterprises "purchasing emission rights" of GHGs (3.4%) and enterprises "selling emission rights" (2.3%) are minorities (Figure-23). The ratios of "want to purchase emission rights" and "want to sell emission rights" in the next three years were both low, at 4.8%. Of course, it is unlikely that all SMEs would participate in emissions trading. One of the reasons are the immature emissions trading platform in Japan. The situation where the advantage of purchasing emission rights is not clear may be another reason.

(4) Measures for Acceleration of the Initiatives.

Next, let us look at the measures desired by SMEs for acceleration of "overall" initiatives to reduce GHGs and nine individual initiative types.

Figure-23 Situation of GHG Emissions Trading



Note: Enterprises currently not doing emissions trading were asked about their plan for the next three years. Answers currently "purchasing emission rights" and "selling emission rights" were included in "want to purchase emission rights" and "want to sell emission rights," respectively, in the plan for the next three years.

To the question of what they think are necessary for acceleration of the initiatives to reduce GHGs, "subsidies/tax incentives" is most frequently chosen, at 21.6%, for "overall" initiatives (Table-8).[28] As to another monetary measure, "favorable treatment in fundraising" was 9.0%. These may be measures to ease the cost increase that was frequently cited as a challenge involved in implementation. There are also respondents who find it necessary to create a better environment for the initiatives, which include "accessible social systems" (9.8%) and "accessible products/services" (8.9%). These may address the challenge of "additional labor" for the initiatives, while asking for improvement in terms of cost. Request for "support and information provision by the governments, associations and commerce/industry groups" (8.3%) indicates the need for providing SMEs with information regarding GHG reduction.

"High social evaluation" (5.5%) and "system of commendation/authorization of implementing enterprises" (2.6%) are not so common. SMEs seem to attach more value to measures that directly improve profitability or reduce labor rather than measures for external evaluation. There are also "not need anything particular" (21.1%) and "don't know" (26.7%).

Regarding individual initiative types, the ratio of "subsidies/tax incentives" is highest for all nine types, which include 19.7% for "energy conservation," 19.6% for "introduction of next-generation vehicles," 19.4% for "use of renewable energy" and 18.1% for "reduction in the use of GHGs." The ratio of "accessible social system" was over 10% for six initiative types, including "introduction of next-generation vehicles" (11.4%) and "recycling" (11.2%), while the ratio of "accessible products/services" was over 10% for "introduction of next-generation vehicles" (12.2%) and "use of recycled products" (10.2%). Next-generation vehicles are still

[28] Up to three most applicable multiple answers. However, respondents who chose "not need anything particular" or "don't know" were not allowed to choose any other choices.

Table-8 What You Think Are Necessary for Acceleration of the Initiatives (Multiple Answers Up to Three)

(%)
(n=1,666)

	Subsidies/tax incentive	Accessible social systems	Favorable treatment in fundraising	Accessible products/services	Coordination in the industry	Support and information provision by the governments, associations and commerce/industry groups	High social evaluation of implementing enterprises	Understanding of consumers/business partners	Favorable treatment in public procurement/bidding	System of commendation/authorization of implementing enterprises	Other	No need for anything in particular	Don't know
Overall	21.6	9.8	9.0	8.9	8.3	5.5	5.2	4.4	3.5	2.6	1.6	21.1	26.7
Energy conservation	19.7	10.3	8.7	9.5	7.1	5.1	4.2	3.8	3.1	2.7	2.7	21.1	26.1
Use of renewable energy	19.4	10.3	8.6	9.1	7.5	5.1	4.0	3.7	3.1	2.3	2.4	20.3	26.7
Reduction in the use of resources other than energy	16.3	10.9	7.0	9.5	7.1	4.8	4.8	3.9	2.9	2.6	1.9	23.0	26.8
Recycling	15.5	11.2	7.9	7.4	6.8	4.8	4.4	4.6	2.6	3.1	1.8	22.8	27.1
Use of recycled products	15.5	10.1	6.3	10.2	6.4	4.7	5.1	5.1	2.9	2.3	1.9	21.9	27.2
Introduction of next generation vehicles	19.6	11.4	8.9	12.2	6.0	5.0	3.6	2.8	3.2	2.3	2.1	20.8	26.1
Reduction in the use of GHGs	18.1	8.7	8.4	8.0	7.4	5.3	4.6	3.6	2.5	3.0	1.7	20.0	28.8
Reduction in movement of persons	14.3	7.4	6.4	7.3	5.0	4.1	5.2	4.5	2.2	2.9	3.3	25.0	28.4
Absorption of GHGs	17.5	8.7	6.8	7.8	6.8	4.6	3.5	3.3	2.7	2.8	2.8	22.3	28.8

Note: We used dark shading for "15% and more" and light shading for "10 to under 15%"

expensive, and charging stations, hydrogen stations, and other infrastructure indispensable for their spread are still insufficient. Network construction by consumers, enterprises, governments and other parties may be essential for efficient recycling. The result also indicates that the quality and prices of recycled products have room for improvement.

6 Conclusion

This paper analyzed SMEs' efforts to reduce GHGs based on the results of the "Survey of SMEs' Efforts toward Decarbonization" conducted by JFCRI in August 2022. At the conclusion, we sort out the findings based on the results of "overall "initiatives.

First, 44.9% of SMEs are implementing initiatives to reduce GHGs. The ratio increased from 41.9% of three years ago.[29] However, the ratio of the enterprises answering their efforts are "advanced" compared with other companies in the same business is as low as 13.2%. Looking at progress indices of these initiatives by corporate characteristics, it is found that larger enterprises in terms of the number of staff members and yearly sales are more advanced in the initiatives, that business conditions and progress corelate positively, and that initiatives tend to progress with young CEOs or senior CEOs.

As to the reason of implementing initiatives, "this is corporate responsibility" (25.4%) and "this is required by society" (24.2%), which may not necessarily contribute to performance improvement of the enterprise, held the first and second places. "To reduce costs," which may contribute to improvement of balance, was also chosen (20.6%). However, it is found that initiatives to reduce GHGs do not always have a positive impact on the business, but may have a negative impact in some cases, and that answers of having a negative impact are more frequent on profitability compared with other items, including number of customers, sales and fund raising.

As to CEOs' personal view of initiatives to reduce GHGs, the ratio of "should be promoted even with a burden on individuals/enterprises" is 19.4%, while the ratio of "should be promoted unless it becomes a burden on individuals/enterprises" is 46.5%: namely, nearly 70% of the CEOs think that the initiatives should be promoted. However, regarding the company's intention for the next three years, the ratio of "want to promote even with a burden on management" is as low as 5.7%, the ratio of "want to promote unless it becomes a burden on management" is 65.1%, and that of "no intention to actively promote" is 29.2%. Many CEOs may think that the initiatives should be promoted, but may want to avoid negative impacts on actual business. In other words, GHG reduction will not make much progress by idealism alone.

Challenges cited by respondents are: monetary challenges including "cost increase" (23.0%) and "fund shortage" (14.1%), operational challenges including "additional labor" (15.0%) and "lack of necessary knowhow and human resources" (9.8%), and information-related challenges including "don't know how to implement" (13.2%) and "don't know who to consult" (6.0%).

To tackle the monetary challenges and accelerate initiatives to reduce GHG, "subsidies/tax incentives" (21.6%)," favorable treatment in fundraising" (9.0%) and other measures to suppress cost increase are presented. To address operational challenges, an environment favorable for the initiatives including "accessible social system" (9.8%) and "accessible products/services" (8.9%) is desired. The desire for such

[29] In Section 6, ratio of "overall" initiatives is shown for all cases.

an environment may include expectation for social infrastructure and products/services at lower prices. To address information-related challenges, some respondents chose “support and information provision by the governments, associations and commerce/industry groups” (8.3%).

For reduction of GHGs of the whole country, initiatives by SMEs, which form a large part of economic activities, are indispensable. For the future, it will be necessary to construct a system of the whole of society to encourage SMEs to ambitiously work on GHG reduction.

However, encouragement through subsidies, tax incentives and other similar measures cannot be used limitlessly under budgetary constraints. Tighter regulations might contribute to GHG reduction, but could generate new costs and labor. If so, it may be essential for GHG reduction to provide even better products/services at lower prices. If the burden on management, including costs and labor, is reduced, efforts by SMEs will be surely accelerated. If the initiatives improve profitability, it will be a strong incentive for CEOs. This is true not only for initiatives by SMEs but also for initiatives by big companies, consumers and central/local governments.

Many enterprises have already started to provide products/services contributing to GHG reduction. While initiatives by big companies, including the launch of electric vehicles by major auto manufacturers, stand out, there are various business sectors that contribute to GHG reduction, and a number of SMEs are successful there. With increasingly active discussions on the sustainability of economic society, the need for initiatives toward GHG reduction is increasing, and related markets are anticipated to further expand. It is expected that the success of SMEs in business fields related to GHG reduction will accelerate the GHG reduction measures of the entire country.

Reference Tables: Sample Weighting

(1) Number of Responses (by Industry Type / by Number of Staff Members)

(Responses)

	5 to 9 staff members	10 to 19 staff members	20 to 49 staff members	50 to 299 staff members	Total
Construction	124	53	64	30	271
Manufacturing	100	64	47	51	262
Information and Communications	42	22	23	25	112
Transportation	35	22	27	30	114
Wholesale and Retail trade	97	55	51	33	236
Restaurant andAccomodations	38	25	32	16	111
Medical, Healthcare and Welfare	62	21	30	21	134
Education, Learning support	29	18	11	12	70
Living-related and personal services and amusement services	26	9	14	10	59
Professional and technical services	60	26	26	12	124
Other services	32	22	25	15	94
Commodity lease and rental, real estate and other	37	25	9	8	79
Total	682	362	359	263	1,666

(2) Actual Number of Enterprises (by Industry type / by Number of staff members)

(Responses)

	5 to 9 staff members	10 to 19 staff members	20 to 49 staff members	50 to 299 staff members	Total
Construction	105,652	51,418	21,902	5,558	184,530
Manufacturing	78,188	49,784	38,429	22,811	189,212
Information and Communications	8,050	5,588	4,903	3,741	22,282
Transportation	10,957	12,443	12,839	8,164	44,403
Wholesale and Retail trade	134,618	77,503	44,914	19,044	276,079
Restaurant andAccomodations	95,122	35,566	14,364	6,481	151,533
Medical, Healthcare and Welfare	82,836	49,607	27,806	19,092	179,341
Education, Learning support	13,858	8,188	6,481	3,239	31,766
Living-related and personal services and amusement services	27,589	12,428	8,034	4,831	52,882
Professional and technical services	34,166	12,981	5,948	2,708	55,803
Other services	35,835	18,753	13,561	9,371	77,520
Commodity lease and rental, real estate and other	31,955	9,720	5,386	3,679	50,740
Total	658,826	343,979	204,567	108,719	1,316,091

(3) Weight (by Industry Type / by Number of staff members)

(magnification)

	5 to 9 staff members	10 to 19 staff members	20 to 49 staff members	50 to 299 staff members
Construction	852	970	342	185
Manufacturing	782	778	818	447
Information and Communications	192	254	213	150
Transportation	313	566	476	272
Wholesale and Retail trade	1,388	1,409	881	577
Restaurant andAccomodations	2,503	1,423	449	405
Medical, Healthcare and Welfare	1,336	2,362	927	909
Education, Learning support	478	455	589	270
Living-related and personal services and amusement services	1,061	1,381	574	483
Professional and technical services	569	499	229	226
Other services	1,120	852	542	625
Commodity lease and rental, real estate and other	864	389	598	460

(4) Correspondence of Industry Categories Between the Weighting and the Questionnaire Analysis

Weighting		Questionnaire analysis
Construction		Construction
Manufacturing		Manufacturing
Information and Communications		Information and Communications
Transportation		Transportation
Wholesale and Retail trade		Wholesale
		Retail trade
Restaurant and Accomodations		Restaurant and Accomodations
Medical, Healthcare and Welfare		Medical, Healthcare and Welfare
Education, Learning support		Education, Learning support
Living-related and personal services and amusement services		Services
Professional and technical services		
Other services		
Commodity lease and rental, real estate and other	(Commodity lease and rental)	
	(Real estate)	Real estate
	(Other)	Other

Note 1: Weight by industry type / by number of employees is calculated using the following formula for each cell.
Weight = actual number of enterprises divided by number of responses
2 Actual number of enterprises is based on the "Economic Census for Business Activity" (2016) of MIC and METI
3 Some of the industry categories do not conform to those of the questionnaire analysis in the text. Correspondence of industry categories is as shown in (4). Weight of "Wholesale/Retail trade" is applied to "Wholesale" and "Retail trade" of the questionnaire analysis. "Living-related and personal services and amusement services," "Professional and technical services," "Other services" and "Commodity lease and rental" of "Commodity lease and rental, real estate and other" are compiled as "Services" after applying their respective weight. The weight of "Commodity lease and rental, real estate and other" is applied also to "Real estate" and "Other" of the questionnaire survey.