

EAJ Report 2019-02

Activities Related to SDGs Science, Technology
and Innovation (STI) Strategies



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THE ENGINEERING ACADEMY OF JAPAN
Project for the Role of Science, Technology and Innovation (STI)
in SDGs

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THE ENGINEERING ACADEMY OF JAPAN

EAJ is an organization that was established for the purpose of contributing towards the development of all aspects of engineering and scientific technology and is composed of members who are leading engineers in industry, university, and government fields. Project teams that use the wealth of experience and knowledge of our members and their wide-ranging network play a key role in promoting investigation proposal activities along with extensive cooperation from outside members. After summarizing the results of these activities, with regards to the direction society should take, we propose leading and creative measures to such as government agencies, legislature, industry, academic societies and research institutes with the aim of implementing such measures into society.

The **"Role of Science, Technology and Innovation (STI) Science, Technology and Innovation (STI) in SDGs" project** has investigated the role of Science, Technology and Innovation (STI) Science, Technology and Innovation (STI) towards achieving Sustainable Development Goals (SDGs), which was unanimously adopted by member states at the United Nations General Assembly in 2015, and has considered specific promotion measures. Recently, a draft of this report was summarized and peer reviewed by the Policy Proposal Committee and then examined by the EAJ Council before the final version was confirmed. Therefore, the Council decided to release it as a report from EAJ. We hope that the report will be used extensively.

This report is a compilation of activity outlines for the “Role of Science, Technology and Innovation (STI) in SDGs” project from the Engineering Academy of Japan, and is available to the general public both inside and outside Japan.

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Summary

1. Background

Sustainable Development Goals (SDGs) was unanimously adopted by member states at the United Nations General Assembly in September 2015. This initiative defines 169 targets and 17 goals which humankind needs to attain by the year 2030 in order to continue sustainable development of our kind. In these targets, many necessitate a proactive role of engineering for achievement. Meanwhile, the beginning of the International Council of Academies of Engineering and Technological Sciences mission statement, an organization in which EAJ is a core member, has been advocating contributions toward sustainable global economic growth and social welfare for some time.

2. Current status and issues

There is no doubt that academic development will play an important role in attaining SDGs. However, individual sciences will surely pass through industries in some fashion, during their journey towards contributing to SDGs. There is a possibility that sequential approaches that give birth to new knowledge through science, then implementing it in industries and significantly contributing to major SDGs targets in society may not be an optimal method for short-term goals for 2030. Science, Technology and Innovation (STI) towards SDGs especially needs closer collaboration with industries and academia, along with the government playing a vital role in accelerating activities.

3. Report content

The decision to establish a new EAJ project “The Role of Science, Technology and Innovation (STI) in SDGs” was made at the EAJ Council meeting in February 2017, at which the leader and PO for this project were also selected. In view of issue number 2 mentioned above, the leader designated the proposal of a “Science, Technology and Innovation (STI) for SDGs” strategy for the Japanese government as the main mission of the project. A total of 20 individuals from both within and outside EAJ participated in the project, with roughly seven selected representatives each from industry, academia and the government as project members. The timing for proposal was designated for the end of 2018 as key international SDGs events were scheduled for 2019. The overall project had three main activities--one was a general meeting in which members will compile and finalize the proposal, another was an open forum to listen to opinions outside of the project members, and the third was a working group to dig deeper into detailed themes that would support the proposal. This report was compiled by the project to inform the EAJ Council, summarizing these activities with the premise that it will be widely communicated to the general public and in other countries.

Note that after the project was launched, Japan was designated as the host country for the 2019 G20 summit. A 50-page, tentative version of the proposal was created in September 2018, six months earlier than the initial schedule, as further acceleration of activities was anticipated. This proposal was delivered from the project to nine ministries and agencies in Japan in October of the same year. Following this, there has already been study meetings focused on this proposal, with the participation of our project leader, at five ministries and agencies, and deliberation towards reflecting the proposal in actual policies has started.

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1. Introduction

SDGs¹ was unanimously adopted by member states at the United Nations General Assembly in September 2015. This initiative defines 17 goals and 169 targets which humankind needs to achieve by the year 2030 in order to continue sustainable development of our kind [Reference material]. Many of these targets can be considered to require a proactive role from engineering to achieve them. Meanwhile, the mission of the International Council of Academies of Engineering and Technological Sciences (hereafter CAETS²), an organization in which EAJ is a core member, is stipulated as shown below in the first two items from among the seven items.

- (A) provide an independent nonpolitical and non-governmental international organization of engineering and technological sciences academies, prepared to advise governments and international organizations on technical and policy issues related to its areas of expertise;
- (B) contribute to the strengthening of engineering and technological activities in order to promote sustainable economic growth and social welfare throughout the world;

For (C) to (G), refer to the sources listed in the footnotes CAETS section.

Since SDGs contain many aspects that engineering, science and technology need to significantly contribute to achieve the goals, and the overall purpose of SDGs aligns well with CAETS's above goals, the Engineering Academy of Japan (hereafter EAJ) decided on the new project "The Role of Science, Technology and Innovation (STI) in SDGs" at the EAJ Council in February 2017. The leader and PO were also nominated for this project.

¹"Sustainable Development Goals (SDGs) is the successor to Millennium Development Goals (MDGs) developed in 2001, and is the international goals for the period of 2016 to 2030 as described in the "The 2030 Agenda for Sustainable Development" that was adopted at the United Nations Summit in September 2015. It comprises 17 goals and 169 targets to achieve a sustainable world, and pledges to leave no one behind (meaning to include all people on Earth). SDGs is universal, and addressed by advanced nations in addition to developing nations. Japan is also actively working towards achieving these goals" (Source: Ministry of Foreign Affairs)

² The International Council of Academies of Engineering and Technological Sciences, Inc., <https://www.newcaets.org/>
"International Council of Academies of Engineering and Technological Sciences (CAETS) is a non-political, non-governmental independent international organization and a member of the Academies of Engineering and Technological Sciences, and only one representing academy from each country that satisfies certain criteria is allowed to become a member. CAETS mission promotes effective advancements in engineering, science and technology in all nations. Furthermore, we want to build a world in which decision-making on a national and international level for economic, social and environmental issues is communicated correctly with consideration for relevant engineering, science and technology. CAETS was established in 1978 and then registered as a non-profit and charitable organization in the USA in 2000. Currently, there are 26 member states.

After the Engineering Academy of Japan (EAJ) acquired CAETS membership in 1990 it has been participating in CAETS activities as a prominent member." (Source: Engineering Academy of Japan <https://www.eaj.or.jp/?p=765>)

2. Issues that need to be resolved

(1) Background

There is no doubt that academic development should play an important role in achieving SDGs. However, individual sciences will surely pass through industries in some fashion, during their journey towards contributing to SDGs. There is a possibility that sequential approaches that give birth to new knowledge through science, then implementing it in industries and significantly contributing to major SDGs targets in society may not be an optimal method for short-term goals for 2030. Science, Technology and Innovation (STI) towards SDGs especially needs closer collaboration with industries and academia, along with the government playing a vital role in accelerating activities.

(2) Limitations and obstacles to overcome

The SDGs project declares that it will strive towards implementing the 17 goals and 169 targets in the name of the head of state and heads of government, etc., in each country. These goals are founded on the Millennium Development Goals (MDGs)³ and are aimed at fulfilling the MDGs that could not be completed while also emphasizing harmonization of the environment, the pursuit of social values, and economic growth.

This agenda requires a demonstration of creativity and innovation in order to resolve issues associated with sustainable development for private companies. In addition to this, the UN has launched the Technology Facilitation Mechanism (TFM)⁴ and is striving to use Science, Technology and Innovation (STI) to facilitate sustainable development based on the cooperation of stakeholders, including those in the private sector.

Initiatives towards world society SDGs is expected to create a market of approximately 1,300 trillion yen (World Economic Forum at Davos 2016). Many global companies from overseas are looking ahead at the changes that SDGs will bring and are accelerating initiatives to enhance their adaption. They are not only directing their own business in relation to SDGs achievement and disseminating it globally, but they are also developing standards and rules (Business Reporting Platform, etc.) through collaboration with a wide range of stakeholders (UNGC⁵, Partnership on AI⁶, etc.).

Moreover, among investment capital, which is the driving force of industry, the amount of fund management towards SDGs and ESG investment⁷ exceeds 2,500 trillion yen (approximately 25% of the total global investment) (GSIA⁸ 2017), and it is estimated that more than half of this investment capital in Europe is being managed based on SDGs and ESG investment standards (IGES⁹ 2018). Directing private companies towards SDGs in this fashion is important from the perspective of Science, Technology and Innovation (STI). During the process in which scientific technology contributes to SDGs, the results always take the form of a product, service, or similar item and then must become prevalent in society. This role mainly falls on industry, or in other words, a company. Therefore, it is necessary that the company's core business, namely their products, services and solutions, are appropriately directed towards SDGs and that they make a fair profit, in addition to the company's initiatives towards compliance with worker's rights.

(3) Presenting technical responses that overcome limitations and obstacles

The decision to establish a new EAJ project "The Role of Science, Technology and Innovation (STI) in SDGs" was made at the EAJ Council meeting in February 2017, at which the leader and PO for

³ Millennium Development Goals

⁴ Technology Facilitation Mechanism (TFM)

⁵ UN Global Contact, <http://www.ungcn.org>

⁶ <https://www.partnershiponai.org/>

⁷ "ESG is an abbreviation of Environment, Social, and Governance. Until now, quantitative financial information such as cash-flow and profit margin have been mostly used as data to measure the value of a company to invest in. In addition to this, investment that takes into account ESG factors (which is non-financial information) is referred to as "ESG investment". There are various factors related to ESG. For example, "E" includes measures against global warming, "S" includes the active role of female employees, and "G" includes the composition of Directors and so on" (Source: GPIF <https://www.gpif.go.jp/investment/esg/#a>)

⁸ Global Sustainable Investment Alliance, <http://www.gsi-alliance.org/>

⁹ The Institute for Global Environmental Strategies, <https://www.iges.or.jp>

this project were also selected. In view of the size of the government's role as mentioned in (1) above, the leader designated the proposal of a "Science, Technology and Innovation (STI) for SDGs" strategy to the Japanese government as the main mission of the project. Therefore, a total of 20 individuals (a number considered to be optimal for this activity) from both within and outside EAJ participated as project members, with roughly seven selected representatives from industry, academia and the government. The timing for proposal was designated for the end of 2018 because key international SDGs events were scheduled for 2019. The overall project operated under three main activities: (1) A general meeting in which members will compile and finalize the proposal, (2) An open forum to listen to opinions from people other than project members, and (3) A working group to dig deeper into detailed themes that would support the proposal.

(4) Illustrating how new technical responses benefit citizens

After the project was launched, further acceleration of the proposal was expected due to such as Japan being designated as the host country for the 2019 G20 summit. Therefore, the proposal was created in September 2018, six months earlier than the initial schedule. The details of the proposal were summarized in a 50-page tentative version and delivered to nine ministries and agencies in Japan. Following this, the proposal was deployed to relevant departments in each ministry and agency, and there has already been study meetings focused on this proposal, with the participation of our project leader, at five ministries and agencies, and deliberation towards reflecting the proposal in actual policies has started.

3. Seeking to resolve issues

The following gives a summary of the activities from this project in accordance with the 3 activities of the project as mentioned in the previous section.

(1) General meeting (policy proposal compiling activity)

To avoid digressing from the discussion due to the extensive nature of SDGs, the leader showed the tentative plan including the essential points of the final policy proposal document as follows at the start of the 2-year project.

The 1st part describes the direction in which Japanese production should move. First, after tentatively comparing EAJ to be a microcosm of Japan's engineering industry, we hypothesize the combination of SDGs goals with technical and industrial fields that the Japanese engineering community is highly likely to contribute to the world based on information and other factors from its members. Next, we consider an index to accelerate global industrial activities towards SDGs in these types of fields. Following this, we describe the policy to make it an international standard.

The 2nd part describes the direction in which Japanese academia should move to develop human resources that can support trends in this type of industry in particular. First, we describe the possibility of developing a new form of industry-government-academia collaboration from the conventional collaboration between a single university and individual company towards a collaboration between a group of universities and industry groups. Next, we consider how to collaborate internationally on human resource development based on the actual state of EAJ youth exchange activities with overseas engineering academies. Following this, we describe the importance of being able to produce human resources from Japan that can support the creation of international rules, and a plan for university reforms to achieve this.

The 3rd part describes the policies expected from the Japanese government to accelerate trends in this type of industry-academia. First, we propose the direction of science and technology policies to enhance the level of Japan's science and technology. Second, we propose the direction of science and technology policies to aim for economic return from industry based on innovation. Third, we propose the direction of science and technology policies to aim for an overall return of national interest based on such factors as diplomacy. Finally, we provide a proposal relating to communication from the Japanese government to the international community. Through the project, we have decided to discuss such matters as the suitability of each item in this proposal plan, digging deeper when appropriate, and alternative proposals when not appropriate.

The first general meeting was held for a period of two hours on the first morning of the 2-year project on April 3, 2017 (Monday). With almost all of the 20 members in attendance, a discussion was held concerning improvements from the above mentioned tentative plan including the essential points of the final policy proposal document, and each member stated which of the items they could make a particular contribution towards in terms of investigating its content. The second general meeting was held in October 2017. Members gave their personal opinions on each of the core messages concerning the items that were shared out for investigation as decided during the first general meeting. At the third general meeting in April 2018, the members discussed the project messages. During the fourth general meeting in October 2018, the members discussed a draft of the proposal document, a general meeting of the investigation stage was completed at this time, and the initial plan to complete the policy proposal document by the end of the project in March 2019 was established. However, after the project was launched, further acceleration of the proposal was expected due to such as Japan being designated as the host country for the 2019 G20 summit. Because of this the fourth general meeting was an ad-hoc meeting with only a small number of appropriate members, email was used instead among all members to discuss matters, and a 50-page tentative version of the proposal document was created in September 2018, six months earlier than the initial schedule. This tentative version was delivered to nine ministries and agencies in Japan. Following this, the proposal was deployed to relevant departments in each ministry and agency, and there has already been study meetings focused on this proposal, with the participation of our project leader, at five ministries and agencies, and deliberation towards reflecting the proposal in actual policies has started.

(2) Open forums (activity to extensively seek opinions from outside the project)

We decided to implement three open forums every six months during the interim months of the above mentioned general meeting in order to obtain an extensive range of opinions from people other than the 20 project members so that we could further reinforce the proposal.

The first open forum was held in July 2017 at Osaka University with the President of the university, Shojiro Nishio, in attendance. We decided on the theme of “Industry Inclusion” towards strengthening the content of the 1st part of the final proposal. The open forum was held after gathering experts from industry, academia, and the government under the main theme of a corporate evaluation index to incorporate industry into activities to achieve SDGs. We invited lecturers from different companies that are progressively tackling SDGs, such as Ajinomoto, Omron, Nikken Sekkei, and Sumitomo Chemical, and listened to reports about the initiatives from these companies, the situation in the industry to which these companies belong, and in particular the possibility of developing an index for each industry. JST introduced overall trends that include other industries, and technical executives from WHO, the World Health Organization, introduced the United Nations use of an index with a focus on the state of the health care sector, which is leading the way. Finally, the Nomura Research Institute and Japan Association of Real Options and Strategy provided explanations about the necessity to quickly launch a study group to establish a financial index. This was one of the triggers that established The Japan Association of Finance for Sustainable Development, which we will discuss later.

The second open forum was held in January 2018 at the International University of Japan with the President of the university, Hiroyuki Itami, in attendance. We decided on the theme of “Connecting the World” towards strengthening the content of the above 2nd part of the final proposal. This advocated the 1st international SDGs forum, which is the first English public forum bearing the SDGs name held in Japan. As a result, we were able to receive higher quality lecture applications and presentations from overseas in particular. Adult international students from about 30 countries, who mainly came from the government in these countries, and who are enrolled at the International University of Japan participated and all of them gave speeches.

We were able to have an enthusiastic discussion throughout the day concerning how Japan’s science and technology should move towards SDGs in particular, and it was an excellent opportunity to add a global, diverse, and broader perspective to this project.

The third open forum was scheduled for July 2018 and to be a forum for discussing topics with active government officials towards strengthening the content of the above 3rd part of the final proposal. However, as mentioned earlier, it was decided to bring the proposal timing forward by a period of six months, which meant that the leader traveled to each ministry to discuss the project on an individual basis instead of holding the open forum.

In addition to the three forums hosted by the EAJ’s SDGs project, the leader attended forums and similar functions hosted by other organizations to work hard on acquiring feedback from various fields through lectures, discussion and contribution, and to further strengthen the final proposal. In February 2017, at a workshop during the American Association for the Advancement of Science (AAAS)¹⁰ event held in Boston, USA, we gave a lecture on the importance of creating an index to establish this project and for industry inclusion with the Co-Chairman of UN SDGs in attendance. In May 2017, at a workshop during the United Nations STI (Science, Technology and Innovation) Forum¹¹ held at the UN Headquarters, we gave a lecture focusing on cases of cooperation between industries, academia and the government in Japan. This content was reported in the news by major international press agencies as noteworthy industry-governmental cooperation in the world towards achieving SDGs. This was an effective opportunity for activities on the international stage thereafter.

¹⁰ AAAS American Association for the Advancement of Science: “The world’s largest community of multi-disciplinary scientists. A non-profit organization that collaborates with 252 scientific communities and societies in the world and has over 10 million members. It is well-known for its publication of the scientific journal “Science”. Established in 1848. The association was created from an attempt to organize scientists from the entire nation during an era in which there were still only a few scientists in America. It is referred to as the world’s first organization that aims to promote science and engineering. (Source: JST <https://www.jst.go.jp/csc/join/overseas/north-america/aaas/index.html>)

¹¹ UN STI for SDGs Forum (UN STI Forum): “The UN STI Forum is an event held once a year to allow various stakeholders such as government officials, scientists, innovators, entrepreneurs, and people from civil society to discuss science, technology and innovation that concerns the implementation of SDGs. It has been held three times so far, in June 2016, May 2017, and June 2018” (Source: Ministry of Foreign Affairs)

For example, in the IEC (International Electrotechnical Commission), which is a major organization in the world on international standards, at the Market Strategy Board, of which the leader of this project is a member, an activity for overall strategy building for international standardization of SDGs was started on the initiative of the project leader, and the activity itself has come to lead the way forward. We were given the opportunity to speak during the opening keynote panel discussion at the All African Science and Technology Conference, where our message was communicated favorably in the African newspapers and by international media.

In Japan, at the SDGs Forum hosted by JST in September, we provided an overview of initiatives towards SDGs throughout the whole of Japan. Based on the content of this forum, the January 2018 edition of “Trends in the Sciences”, a journal co-edited and published by the Science Council of Japan was published as a special edition about SDGs.

☆ The journal features information on industrial initiatives from Kenichiro Yamanishi, Vice-Chairman of Keidanren (the Japanese Business Federation) and Chairman of Mitsubishi Electric, governmental initiatives from Hideo Suzuki, Director-General at the Ministry of Foreign Affairs (MOFA), academic initiatives at universities from Makoto Gonokami, President of University of Tokyo, and initiatives at national research institutes from Ryoji Chubachi, President of AIST (National Institute of Advanced Industrial Science and Technology). This project was responsible for writing about the initiatives of industry-government-academia collaboration.

In 2017, in terms of external functions, at a training session hosted in November by the Ministry of Economy, Trade and Industry, a discussion was held focusing on international standardization trends relating to this project. Also in November, from the keynote speech at the International Forecasting Society, a discussion was held between everyone from strategy institutions in each country, including Japan, and people from departments in private companies concerning the use of SDGs for strategic planning in private companies. Furthermore, at a forum hosted by NEDO at the International AI and Robotics Exhibition in November, a concept plan was presented to combine SDGs, AI, and social infrastructure, where it was asked if this was appropriate. In December, at the Technology Strategy Symposium from JEITA (Japan Electronics and Information Technology Industries Association) given the title “Towards Social Implementation of AI and SDGs Society 5.0”, we gave a lecture on “AI and SDGs technology strategy” and also held a panel discussion on the main theme of the symposium. Prior to this, we were able to debate on the same topic at JEMA (Japan Electrical Manufacturers' Association). In January 2018, we held an inaugural meeting for The Japan Association of Finance for Sustainable Development, which is explained in detail in the financial index working group mentioned later. Then at the first meeting of the SDGs task force launched in the Cabinet Office also during January, we introduced this project and made a proposal to the government. Also in January, we exchanged opinions and ideas with senior officials in the Ministry of Finance. In March, we gave a proposal for international cooperation and talked about the importance of industry-government-academia collaboration towards SDGs at the keynote panel discussion of the All African Science and Technology Forum, which is explained in detail in the working group for building a symbol case for social infrastructure mentioned later. In May and July, we exchanged opinions with the former chairman of the German Academy of Science and Engineering (acatech). In June, we held a lecture to commemorate the founding of EAJ Kansai Branch. Also in June, we announced an SDGs strategy plan at the IEC Board Meeting (held in Washington DC), which is explained in detail in the international standardization & international rule formation working group. After returning to Japan, we reported a summary of this to the Ministry of Economy, Trade and Industry, the Japanese Standards Association, and their member companies. In July, we gave a lecture and held a panel discussion at the Japan Society for Research Policy and Innovation Management, which was held at Waseda University. Then in September, we gave a lecture and conducted other functions at the Chinese Academy of Sciences.

(3) Working groups (activity to dig deeper into specific themes to be the basis of the proposal)

We set up working groups and each working group worked closely with organizations outside EAJ on topics considered to be important as the basis of the final proposal, namely a) a financial index, b) international standardization & international rule formation, and c) building a symbol case for social infrastructure.

a) Financial index

As mentioned earlier, in February 2017, at a workshop during the American Association for the Advancement of Science (AAAS) event held in Boston, USA, we gave a lecture on the importance of creating an index to establish this project and for industry inclusion with the Co-Chairman of UN STI for SDGs in attendance. At this event, we asserted that companies generally operate based on short-term current operating performance and long-term market capitalization, and therefore, it is important to invent a financial index that directly links SDGs initiatives and this type of financial index as much as possible for SDGs industry inclusion. In May 2017, on the opportunity of lecturing at the STI for SDGs forum workshop held at the UN Headquarters in New York, USA, we discussed the importance of creating the above mentioned financial index with the World Bank and confirmed its direction.

After returning to Japan, we held a discussion with executives from Japan Association of Real Options and Strategy, raised the above issues to the financial engineering community from EAJ at a special study group from JAROS in June, and we were able to exchange opinions with financial engineering experts from industry and academia about this topic. In addition, our collaboration with Japan Association of Real Options and Strategy was triggered after reading the following description in a JAROS academic journal from March 2017.

First, the purpose of this association is defined as essentially estimating option value from holding assets that contain uncertainty and risk, the transaction value of such assets, and associated data, and then promoting this in close collaboration with industry and academia on a practical basis.

Second, the association has published a paper on the subject of what those parties deeply involved in the development of corporate governance codes and stewardship codes, which are two typical types of code for corporate governance, should do about measures required to improve the current corporate value and long-term corporate value. Incidentally, corporate governance codes are guidelines for companies to enable them to govern themselves, while stewardship codes are guidelines for investors to evaluate companies that have this type of governance.

Third, the association holds a study group every month, receives lectures from successful venture company executives, and has made efforts as an association to create tacit knowledge for factors as to why companies are successful.

The special study group at JAROS was held under the theme of “The Role of Science, Technology and Innovation (STI) in SDGs - What role can innovative companies contribute?” During the study group, we stated that there is a need for the most important corporate evaluation index to direct private companies towards SDGs from the EAJ project, and raised the issue that it is necessary to quantify how such things as corporate investment, governance, and social contribution relate to improving corporate value in order to create this corporate evaluation index. We were able to share awareness of this issue with financial academic researchers, and financial executives from multiple companies.

As a result of this discussion, “The Japan Association of Finance for Sustainable Development” was established in a form that would surpass the association. This led to the establishment of The Japan Association of Finance for Sustainable Development in January 2018. Professor Tetsuo Kitagawa from Aoyama Gakuin University, who was also involved in writing the above mentioned “Ito Review¹²” from the Ministry of Economy, Trade and Industry (METI) and a former senior analyst for JP Morgan, was appointed as the association’s President, while the project leader from EAJ was appointed as its Vice-President.

At the beginning of the inaugural meeting in January, the association’s President gave an explanation about their basic policy. Professor Kitagawa talked about encouraging the creation of long-term investors who embody the value of SDGs by establishing a sustainability information disclosure standard based on SDGs and training sustainability analysts, as tasks that should be conducted

¹² Ito Review: “Ito Review is the common name of a final report on “Competitiveness and Incentives for Sustainable Growth: Building Favorable Relationships between Companies and Investors” Project from the Ministry of Economy, Trade and Industry, which was chaired by Professor Kunio Ito of Hitotsubashi University (at that time), and was published in August 2014. The review analyzes issues and provides proposals to enable companies to acquire capital towards sustainable growth through discussion with investors and increase corporate value. The review published the ROE target level at 8%, and this received a significant response from the business world. “Ito Review 2.0” was also published as an updated version in October 2017.” (Source: Mizuho Securities, Hitotsubashi University, Financial Glossary)

immediately. Following this, the project leader, who is the Vice-President of the association, gave an explanation about the necessity and importance of financial SDGs. During the keynote speech, Professor Emeritus Moridaira of Keio University talked about issues relating to investment evaluation standards for companies that promote SDGs, showed the direction of development based on conventional ESG investment, and also touched on the numerical analysis of SDGs bonds issued by the World Bank. The Investment Manager at Nomura Asset Management, who is the association's Director, gave an explanation on the significance of SDGs in ESG investment. He asserted that the SDGs framework will be a better common language between investors and companies, it is expected to have a greater improving effect on the potential for completeness and comparison of evaluation factors, and it is necessary to steadily build consensus during the investment chain for the new index, etc. Another Director from Quick Corp ESG Research Center in the Nikkei Group introduced us to the perspective of overseas investors in relation to SDGs. This company has a business partnership with Vigeo Eiris, a well-known investment information vendor based in Europe, and provided an outline of advanced methodology for the ESG evaluation index. They also emphasized on the necessity to dynamically update in accordance with the release of innovative products and services in the future, and market changes. Director Naoki Mori from the Institute for Global Environmental Strategies (a member of this project) introduced a SDGs target interrelated analysis tool. He stated that this tool enables us to clarify the interrelationship between the economy and initiatives for such as the environment, and pointed out its possibility for further improving the prioritization of initiatives within companies. Toyoaki Nakamura, a member of the GPIF Management Committee, and former Vice-President and CFO of Hitachi talked about his expectations concerning the formation of new rules on international finance for SDGs from the perspective of a financial officer in a business company. Takaaki Kobayashi, Vice-Chairman of Japan Association of Real Options and Strategy, who is also the Chief Secretariat of the association, and Senior Research Fellow at Nomura Research Institute, explained the future operation plan. Finally, visitors from the Global Issue Response Section at MOFA, the Financial Services Agency International Office, and the Corporate Accounting Office at METI spoke about what they expect from the association. After its establishment, the association has been constantly conducting activities such as enhancing its analysis on the relationship between corporate performance and SDGs/EGS activities, introducing and discussing JICA's social bonds¹³, and holding study meetings with personnel from the Financial Services Agency.

b) International standardization & international rule formation

The project leader chaired the working group that was first set up at the public and private sector strategy meeting on international standardization from the Ministry of Economy, Trade and Industry, held the year before this project. Members from industry groups including the Japan Electrical Manufacturers' Association, Japan Electronics and Information Technology Industries Association, Japan Chemical Industry Association, Japan Construction Material & Housing Equipment Industries Federation, Japan Chemical Fibers Association, Japan Automobile Federation, Japan Business Federation and The Japan Chamber of Commerce and Industry participated in this meeting. Three action plans were reported concerning the importance of forming international rules for international standardization in the near future.

In particular for human resource development in the near future, a new lecture was established for the first time to develop human resources for forming international rules with the cooperation of the five national universities in the Tama area (University of Electro-Communications, Tokyo University of Agriculture and Technology, Hitotsubashi University, Tokyo University of Foreign Studies, and Tokyo Gakugei University). This is a common unit lecture targeting all 1st year undergraduate students in each field of telecommunication, agro-industrial, business, international, and education. The project leader and its members contributed to the design of the lecture's content. Additionally, the industry groups directly assisted by stating their needs, providing lectures from corporate executives, and introducing

¹³ Social bonds: "Social bonds refers to bonds subject to ESG investment, which are issued to finance projects that contribute towards solving social issues (social projects), as defined in the Social Bonds Principles (*) established by ICMA (International Capital Market Association). (*) Social Bonds Principles are guidelines for autonomous procedures established by ICMA for the purpose of promoting the orderly development of the social bonds market. This was first shown in June 2017 and then a revised version was presented in June 2018." (Source: JASSO)

various real-life cases among other things. This enabled an example of a group of universities and industry groups coming face-to-face and communicating the true needs of industry. This initiative was also published in a news release from METI. This collaboration with the five universities was given the name “Tama Global Innovation Initiative” and regular meetings still continue today.

The three major organizations for international standardization are ISO¹⁴, IEC¹⁵ and ITU¹⁶. The project leader serves as a board member for strategy at IEC. Other board members are from Siemens, SAP, Eaton, Haier and Huawei from China, and other Chief Technical Officers (CTOs), with Hitachi and TEPCO from Japan, while the Chairman is a member of the US Congress and former Attorney-General of Massachusetts, and the Convener is the acting Chairman for the State Grid Corporation of China. The establishment of an IEC SDGs strategy formulation task force was proposed between June 18 to 22, 2017 at this board. In the IEC strategy white paper, they advocated that SDGs should be set as the framework for global concern, and comprehensive discussion should be had on future strategy from IEC and what form this should take. As a result, a task force was created on the strategy board for the first time in IEC history, and the project leader was placed in charge of the entire operation.

We divided the activities of IEC’s Technical Committee (TC) into each SDGs goal in order to see an overview of current IEC activities from the perspective of SDGs. We also performed the same analysis for both ISO and ITU. Public information was used for activities from the TC or ITU Study Group (SG). Classification based on the activities and role of TC and SG show the direction of activities towards SDGs at that point in time for each organization. By comparing the results for the three organizations, we clarified the SDGs goals and division of roles where each organization’s strength lies, and investigated the direction of collaboration. Furthermore, we compared the working groups (WG) affiliated with each TC in IEC in 2011 and 2016 to find the transition in the TC’s characteristics. The Ministry of Economy, Trade and Industry was provided with past WG data numbering approximately 10 thousand. We further extrapolated this transition into the future to find trends for the future. At the time, we received opinions relating to each technical field from experts from JEMA¹⁷ and other organizations. Meanwhile, to predict the future of the off-trend standardization field and not be excessively focused on past trends, we made predictions on several new markets based on the insight of task force members.

Based on this knowledge, we investigated IEC’s position in SDGs and its inherent state over approximately one year until 2018 to create the “position and ambition paper”. While announcing this during the board meeting held in Washington DC in May 2018, the paper was praised highly, and we then decided to publish it in a version available to the general public.

In addition, initiatives for SDGs have been accelerating in both ISO and ITU, and it is necessary for us to work closely in cooperation with the three organizations, including IEC. ISO has classified established standard documents into each SDGs goal, and released them on their website. This has given us a database on how the accumulation of standardization so far can be useful to SDGs goals, rather than the

¹⁴ “ISO’s official name is International Organization for Standardization. ISO is non-governmental organization with a legal personality based on approval by the Swiss Civil Code. It is perhaps the most famous ISO in terms of an organization that sets international standards but, in a strict sense as stated above, it is not an international organization like the United Nations. However, after the WTO/TBT agreement came into effect, countries that had concluded the agreement were required to use international standards. Therefore, it is commonly recognized in the world that each country is subject to the international standards established by ISO. (Source: Standard Certification Unit, Industrial Technology & Environment Bureau, Ministry of Economy, Trade and Industry)

¹⁵ “IEC (International Electrotechnical Commission) is a non-governmental organization with a legal personality based on approval by the Swiss Civil Code just like ISO, and was founded in 1906 in England. IEC develops and issues international standards for electrical and electronic technology, and related technology. ISO does not operate in this area so the IEC and ISO are completely separate entities.” (Source: Standard Certification Unit, Industrial Technology & Environment Bureau, Ministry of Economy, Trade and Industry)

¹⁶ “ITU (International Telecommunication Union) is an international organization responsible for international standards in all fields of telecommunication with 191 countries as members as of April 1, 2008. It was established in 1932 by combining the International Telegraph Union and International Radiotelegraph Union. Furthermore, the ITU is a specialized agency of the United Nations, and basic rules relating to ITU are ratified by treaties between member countries. Communication carriers, communication device manufacturers, research institutes, international telegraph agencies, and regional telegraph agencies are admitted as branch members in addition to the admission of the governments of each country as nation members. The General Secretariat is based in Geneva, Switzerland.” (Source: Standard Certification Unit, Industrial Technology & Environment Bureau, Ministry of Economy, Trade and Industry)

¹⁷ The Japan Electrical Manufacturers’ Association

direction of activities from TC and such. Furthermore, noteworthy developments are the standards from the green report in TC207 Environmental Management and TC322 Sustainable Finance investigations. This project emphasizes the importance of financial SDGs, and we must be cautious of these trends. ITU advocates “ICT4SDGs”, which focuses on ICT-centric economic growth, innovation and job creation. (“ICT-centric economic growth, innovation and job creation # ICT4SDG”) ICT has also organized cases that can contribute to achieving this in each SDGs goal, and released them on their website. Furthermore, each SG is making progress with initiatives to announce and publish priority future initiative fields classified by SDGs goals.

c) Building a symbol case for social infrastructure

The leader spoke at a panel discussion immediately following Paul Kagame’s (the President of Rwanda and Chairman of the African Union) opening speech at the All African Science and Technology Conference held in Kigali, the capital city of Rwanda, in March 2018. This meeting was named the “Next Einstein Forum”¹⁸ and is held every other year in subsequent countries around Africa. A BBC correspondent serves as the moderator of this forum. Other panelists who spoke during the event were the World Bank’s chief economist, the chairman of the All African Science and Technology Conference, investors from the USA, and the Vice-President of Johnson & Johnson from the industrial sector. A thousand people, ranging from government ministers from each African nation, the financial sector, the academic community, and well-known research institutes from Europe and the United States, corporate executives, and Nobel Prize winners, listened to the speeches. During remarks from the panel discussion, proposals were given concerning such things as international academic collaboration with Africa to achieve SDGs. These remarks appeared in the Rwandan New Times newspaper on the following day, and subsequently were also distributed worldwide by Bloomberg News.

Based on this lecture, discussion on building a symbol case for social infrastructure in Africa continues to spread.

At the same time as this was happening, the leader also spoke during the opening panel discussion at the 1st Forum on Artificial Intelligence in Africa from UNESCO held in the suburbs of Marrakesh, Morocco, in December 2018. The moderator for this event was the editor-in-chief of the African section of Le Monde, the French daily newspaper, while other panelists were from Europe, America, and China. The leader advocated the three items as the principle of an AI society directed towards future humanity with SDGs in mind.

¹⁸ **NEF Next Einstein Forum:** “NEF, which was established in 2013, is an initiative started by both the African Institute for Mathematical Science (AIMS) and the Robert Bosch Stiftung foundation, and serves as an international platform for science and technology in Africa. ☆ The NEF has been approved by the African Union Commission and UNESCO, along with each government in Rwanda, Senegal, and South Africa, and the African Academy of Sciences (AAS). Many more partners from the private sector and civil society from each country are also attempting to position the African scientific community as a potential member that will have an impact on the world’s scientific community. This will lead to sustainable human development for both Africa and other countries. (Source: JST/CRDS <https://www.itu.int/en/sustainable-world/Pages/default.aspx>)

4. For efficient social implementation

For the proposal document given to the Japanese government, we made great effort to stick to our stance as a member of the party, and avoided merely making a list of requests to the government. Meaning, we stated the EAJ activities and their purpose, and after considering it necessary to adopt the attitude of saying “Therefore, we want the government to work on...”, we described the reason for the activities, in particular, based on evidence.

The first piece of evidence is a broader view from the perspective of SDGs from the Japanese government’s total science and technology budget. Classification of the government’s policy and budget implemented from the perspective of SDGs in the Japanese government was conducted by the SDGs Promotion Headquarters in the Prime Minister’s Office of Japan, and an SDGs related budget has been set up which contributes to regional revitalization announced by the Office for the Promotion of Regional Revitalization in the Cabinet Office. However, there was no classification that linked the policy for Science, Technology and Innovation (STI) to comprehensive SDGs goals. The budget relating to policy for Science, Technology and Innovation (STI) from the Japanese government is termed the “Science and Technology Budget”, and this is defined by the government as “in addition to the expenses to promote science and technology, the necessary expenses for such as science and technology among subsidies for private schools and grants for operating costs at national universities, new project initiatives that use science and technology, demonstration tests of new technology in the real world, and initiatives to popularize and promote existing technology in the real world” (Cabinet Office news release) The Cabinet Office and Ministry of Finance classified whether the said budget is applicable or not from the Science, Technology and Innovation (STI) policy by government project without distinction of a general account or special account. All projects in Japan have been summarized in the standardized form of “Government Project Review Sheet” based on the Government Project Review¹⁹, and this has been released to the public by the Headquarters for the Promotion of Administrative Reform. In addition, the Science and Technology Budget for FY2018 was 3,840.1 billion yen with 1,000 projects.

Therefore, based on data from the Government Project Review Sheet from the Headquarters for the Promotion of Administrative Reform, all items from the Science and Technology Budget of FY2018 were examined and classified for their relevance to SDGs goals while seeking advice from the Evidence Office in the Science and Technology Policy Department of the Cabinet Office. At this time, the budget amount was distributed proportionally under the assumption that projects that met multiple goals would contribute equally to each of the goals. In addition, all science and technology related projects contributed to SDGs except when the details of the project were unclear.

From the Government Project Review Sheet approximately 810 billion yen for “expenses necessary to run national universities” (university operating cost grants) and approximately 230 billion yen for “subsidies for scientific-research projects” (scientific research cost) were cited as projects that had large single budget amounts, had an inclusive description for their project content, and were not sufficiently detailed enough in their description to classify by SDGs goal. This accounts for about one third of the Science and Technology Budget. In addition to this type of project, there were also “operating cost subsidies for private universities” (private school subsidies) at approximately 150 billion yen and “expenses necessary for grants towards the operation of the National Research and Development Agency” (NRDA operating cost grants) at approximately 100 billion yen to several billion yen.

Among these, in particular university operating cost grants and scientific research cost were provisionally classified under the assumption that they temporarily correspond to SDG4 education and SDG9 innovation (target 9.5: innovation promotion, researchers, research cost increases, scientific research promotion, and technical ability improvement). However, when building the SDGs strategic vision for the whole of Japan in the near future, it is extremely important to decipher the profiles of universities, where human development and knowledge accumulation take place, in greater detail to identify the long-term future of Japan. When proceeding with the classification of SDGs goals for the university budget, an attempt was made to classify all research themes of scientific research cost from a

¹⁹ Government Project Review: “This is an inspection and review conducted by each government ministry on all 5,000 projects approximately in Japan to ensure that the PDCA cycle (Plan - Do - Check - Action) is functioning for these projects. In other words, it is a thorough examination of government projects. (Source: Headquarters for the Promotion of Administrative Reform, Cabinet of Japan <https://www.gyoukaku.go.jp/review/review.html>)

single university. With cooperation from Shojiro Nishio, President of Osaka University, who is the EAJ Kansai Branch Chair, we classified a total of approximately 7,000 themes, to which the budget was allocated at Osaka University in 2017, into SDGs goals. The same classification standard as for the government budget was used. Scientific research cost subsidizes individual university researchers after undergoing a certain examination, and this was regarded to correlate well with the research strengths at each university.

☆ This is equivalent to assuming that field classification for scientific research cost is a proxy variable for distributing university operating cost grants. As a result, we obtained a profile for each SDGs goal of the Science and Technology Budget from the Japanese government. Based on this data, we made proposals for science and technology policies.

The second piece of evidence is an overview of human resources in the Japanese engineering community. We analyzed EAJ members in order to have an overview of human resources in the engineering community, which is responsible for creating technology and its social implementation. These EAJ members, who are people who have made significant contributions to such as academic research, corporate technological development, and technology policies in the field of engineering, were screened before being enrolled into this analysis. Therefore, it can be assumed that this is a good sample that represents engineering human resources throughout Japan and in particular its characteristics of strength. EAJ has registered each of the specialized knowledge and skill for all of its members. Many of these members have also had their achievements and field of activity to date registered. Analyzing from these two approaches of skill and actual activities (social implementation) is important for competence analysis. However, there was often a lack of data for the latter approach (activities) and to compensate for this we collected member history and activity records from open source information on the Internet for around half of the total number of members (700 members). We allocated and classified this information into SDGs goals to systematically represent actual activities of members and their contribution to society. The same classification standard as for the government budget was used. As a result, we obtained a 2D matrix of human resource distribution that leads to technical expertise, and social value in which this technical expertise is represented in SDGs through people. This analysis was conducted with the intent of identifying strong fields in Japan while also providing guidance for Japan strategies by comparing it with engineering academies in each country. In addition to this evidence, the National Research and Development Agency is responsible for activities of the Japanese government to directly implement research and development, or indirectly implement the mobilization of private organizations through funding. We also classified the budget (mainly operating cost grants) for these into each SDGs goal. People who are active in wider fields at the Institute of Physical and Chemical Research and National Institute of Advanced Industrial Science and Technology, etc., were sub-divided into denominations of internal departments. Based on this data, we made proposals for industry and technology policies.

The third piece of evidence is analysis of such as the science and technology budget in the ODA budget. Based on this data, we made proposals for science and technology foreign policies.

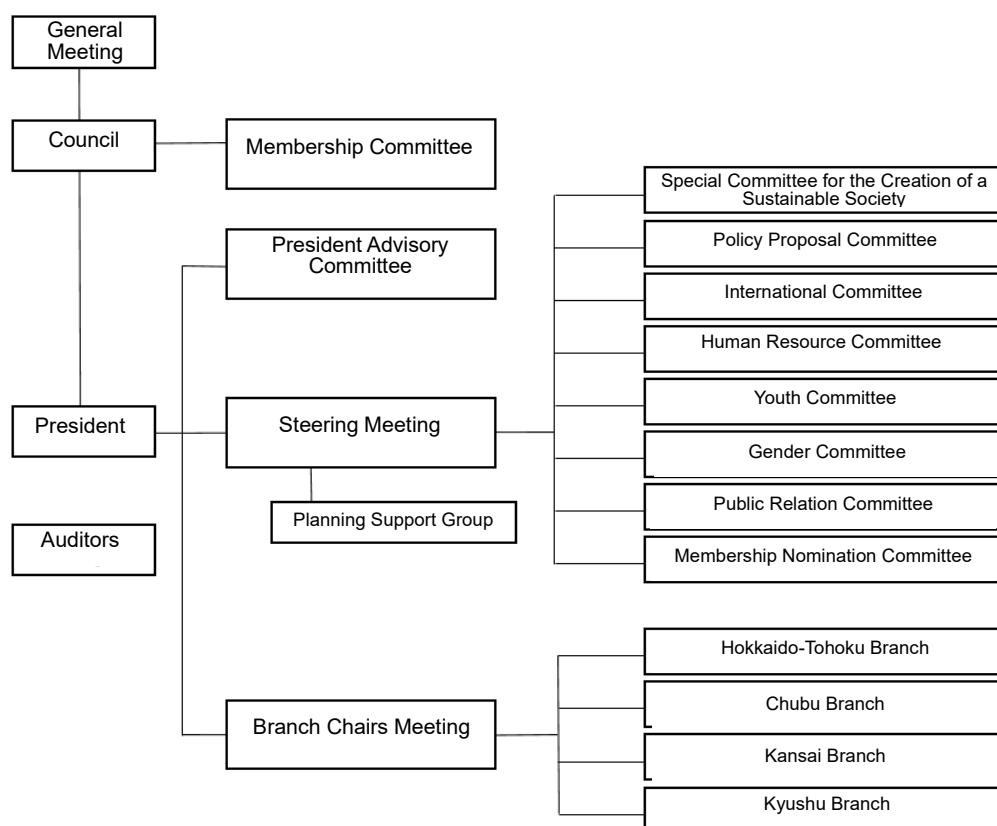
The details of the proposal containing the above were summarized in a 50-page tentative version and delivered directly to the nine ministries and agencies of the Japanese government, which included the Cabinet Secretariat, Cabinet Office, Ministry of Finance, Financial Services Agency, Ministry of Foreign Affairs, Ministry of Economy, Trade and Industry, Ministry of Internal Affairs and Communications, Ministry of Agriculture, Forestry and Fisheries, and Ministry of Education, Culture, Sports, Science and Technology. Following this, there has already been study meetings focused on this proposal, with the participation of our project leader, at five ministries and agencies, and deliberation towards reflecting the proposal in actual policies has started.

5. Conclusion

While promoting the activities of this project, they were not always open, but the results of the activities were proposed directly to each ministry and agency. The various SDGs strategies for Science, Technology and Innovation (STI) in Japan were set as actual policy and when these policies contributed effectively towards Japan's development in competition with other countries, the project achieved results for what we originally intended. With a strong incentive for achieving these types of results, we concluded that an organization should be set up in which EAJ is proactively involved after aiming for the creation and implementation of policies by each ministry and agency, and governmental parties of the proposal.

The diagram below shows a proposal for this project concerning the new EAJ organization.

The Engineering Academy of Japan Organization Chart (FY2019)



We will propose the name “Special Committee for the Creation of a Sustainable Society”. This conforms to the name proposal of “Achieving a Sustainable Developing Society”, as stated in the 1st line of EAJ’s philosophy. The activity period will be set to a fixed term that lasts until 2030 in order to clearly indicate that specific activities will be synchronized with SDGs and accelerated through co-creation with external organizations. In particular, this will be called “Special Committee” in order to clearly indicate that it is a fixed-term organization.

The goals are the three items shown below.

1. Assist the Japanese government with their implementation of SDGs strategy proposals from EAJ and continue providing the Japanese government with SDGs strategy proposals
2. **Promote** SDGs global-focused activities for Japan, **providing the support needed for financial SDGs and ESG investment.**
3. Create performance records of tasks we committed to for EAJ proposal activities

-End of document-

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Goal 1. End poverty in all its forms everywhere

- 1.1 By 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than \$1.25 a day
- 1.2 By 2030, reduce at least by half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions
- 1.3 Implement nationally appropriate social protection systems and measures for all, including floors, and by 2030 achieve substantial coverage of the poor and the vulnerable
- 1.4 By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance
- 1.5 By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate - related extreme events and other economic, social and environmental shocks and disasters
- 1.a Ensure significant mobilization of resources from a variety of sources, including through enhanced development cooperation, in order to provide adequate and predictable means for developing countries, in particular least developed countries, to implement programmes and policies to end poverty in all its dimensions
- 1.b Create sound policy frameworks at the national, regional and international levels, based on pro-poor and gender-sensitive development strategies, to support accelerated investment in poverty eradication actions

Goal 2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture

- 2.1 By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round
- 2.2 By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons
- 2.3 By 2030, double the agricultural productivity and incomes of small -scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment
- 2.4 By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality
- 2.5 By 2020, maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at the national, regional and international levels, and promote access to and fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge, as internationally agreed
- 2.a Increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development and plant and livestock gene banks in order to enhance agricultural productive capacity in developing countries, in particular least developed countries
- 2.b Correct and prevent trade restrictions and distortions in world agricultural markets, including through the parallel elimination of all forms of agricultural export subsidies and all export measures with equivalent effect, in accordance with the mandate of the Doha Development Round
- 2.c Adopt measures to ensure the proper functioning of food commodity markets and their derivatives and facilitate timely access to market information, including on food reserves, in order to help limit extreme food price volatility

Goal 3. Ensure healthy lives and promote well-being for all at all ages

- 3.1 By 2030, reduce the global maternal mortality ratio to less than 70 per 100,000 live births
- 3.2 By 2030, end preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under-5 mortality to at least as low as 25 per 1,000 live births
- 3.3 By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water - borne diseases and other communicable diseases
- 3.4 By 2030, reduce by one third premature mortality from non -communicable diseases through prevention and treatment and promote mental health and well-being
- 3.5 Strengthen the prevention and treatment of substance abuse, including narcotic drug abuse and harmful use of alcohol
- 3.6 By 2020, halve the number of global deaths and injuries from road traffic accidents
- 3.7 By 2030, ensure universal access to sexual and reproductive health-care services, including for family planning, information and education, and the integration of reproductive health into national strategies and programmes
- 3.8 Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all
- 3.9 By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination
- 3.a Strengthen the implementation of the World Health Organization Framework Convention on Tobacco Control in all countries, as appropriate

3.b Support the research and development of vaccines and medicines for the communicable and non-communicable diseases that primarily affect developing countries, provide access to affordable essential medicines and vaccines, in accordance with the Doha Declaration on the TRIPS Agreement and Public Health, which affirms the right of developing countries to use to the full the provisions in the Agreement on Trade-Related Aspects of Intellectual Property Rights regarding flexibilities to protect public health, and, in particular, provide access to medicines for all

3.c Substantially increase health financing and the recruitment, development, training and retention of the health workforce in developing countries, especially in least developed countries and small island developing States

3.d Strengthen the capacity of all countries, in particular developing countries, for early warning, risk reduction and management of national and global health risks

Goal 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

4.1 By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes

4.2 By 2030, ensure that all girls and boys have access to quality early childhood development, care and pre-primary education so that they are ready for primary education

4.3 By 2030, ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university

4.4 By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship

4.5 By 2030, eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples and children in vulnerable situations

4.6 By 2030, ensure that all youth and a substantial proportion of adults, both men and women, achieve literacy and numeracy

4.7 By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development

4.a Build and upgrade education facilities that are child, disability and gender sensitive and provide safe, non-violent, inclusive and effective learning environments for all

4.b By 2020, substantially expand globally the number of scholarships available to developing countries, in particular least developed countries, small island developing States and African countries, for enrolment in higher education, including vocational training and information and communications technology, technical, engineering and scientific programmes, in developed countries and other developing countries

4.c By 2030, substantially increase the supply of qualified teachers, including through international cooperation for teacher training in developing countries, especially least developed countries and small island developing States

Goal 5. Achieve gender equality and empower all women and girls

5.1 End all forms of discrimination against all women and girls everywhere

5.2 Eliminate all forms of violence against all women and girls in the public and private spheres, including trafficking and sexual and other types of exploitation

5.3 Eliminate all harmful practices, such as child, early and forced marriage and female genital mutilation

5.4 Recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility within the household and the family as nationally appropriate

5.5 Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life

5.6 Ensure universal access to sexual and reproductive health and reproductive rights as agreed in accordance with the Programme of Action of the International Conference on Population and Development and the Beijing Platform for Action and the outcome documents of their review conferences

5.a Undertake reforms to give women equal rights to economic resources, as well as access to ownership and control over land and other forms of property, financial services, inheritance and natural resources, in accordance with national laws

5.b Enhance the use of enabling technology, in particular information and communications technology, to promote the empowerment of women

5.c Adopt and strengthen sound policies and enforceable legislation for the promotion of gender equality and the empowerment of all women and girls at all levels

Goal 6. Ensure availability and sustainable management of water and sanitation for all

6.1 By 2030, achieve universal and equitable access to safe and affordable drinking water for all

6.2 By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations

6.3 By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally

6.4 By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity

6.5 By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate

6.6 By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes

6.a By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-

related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies

6.b Support and strengthen the participation of local communities in improving water and sanitation management

Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all

7.1 By 2030, ensure universal access to affordable, reliable and modern energy services

7.2 By 2030, increase substantially the share of renewable energy in the global energy mix

7.3 By 2030, double the global rate of improvement in energy efficiency

7.a By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology

7.b By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States and landlocked developing countries, in accordance with their respective programmes of support

Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

8.1 Sustain per capita economic growth in accordance with national circumstances and, in particular, at least 7 per cent gross domestic product growth per annum in the least developed countries

8.2 Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour-intensive sectors

8.3 Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small- and medium-sized enterprises, including through access to financial services

8.4 Improve progressively, through 2030, global resource efficiency in consumption and production and endeavour to decouple economic growth from environmental degradation, in accordance with the 10-Year Framework of Programmes on Sustainable Consumption and Production, with developed countries taking the lead

8.5 By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value

8.6 By 2020, substantially reduce the proportion of youth not in employment, education or training

8.7 Take immediate and effective measures to eradicate forced labour, end modern slavery and human trafficking and secure the prohibition and elimination of the worst forms of child labour, including recruitment and use of child soldiers, and by 2025 end child labour in all its forms

8.8 Protect labour rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment

8.9 By 2030, devise and implement policies to promote sustainable tourism that creates jobs and promotes local culture and products

8.10 Strengthen the capacity of domestic financial institutions to encourage and expand access to banking, insurance and financial services for all

8.a Increase Aid for Trade support for developing countries, in particular least developed countries, including through the Enhanced Integrated Framework for Trade-related Technical Assistance to Least Developed Countries

8.b By 2020, develop and operationalize a global strategy for youth employment and implement the Global Jobs Pact of the International Labour Organization

Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

9.1 Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all

9.2 Promote inclusive and sustainable industrialization and, by 2030, significantly raise industry's share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries

9.3 Increase the access of small-scale industrial and other enterprises, in particular in developing countries, to financial services, including affordable credit, and their integration into value chains and markets

9.4 By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities

9.5 Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per

1 million people and public and private research and development spending

9.a Facilitate sustainable and resilient infrastructure development in developing countries through enhanced financial, technological and technical support to African countries, least developed countries, landlocked developing countries and small island developing States

9.b Support domestic technology development, research and innovation in developing countries, including by ensuring a conducive policy environment for, inter alia, industrial diversification and value addition to commodities

9.c Significantly increase access to information and communications technology and strive to provide universal and affordable access to the Internet in least developed countries by 2020

Goal 10. Reduce inequality within and among countries

10.1 By 2030, progressively achieve and sustain income growth of the bottom 40 per cent of the population at a rate higher than the national average

10.2 By 2030, empower and promote the social, economic and political inclusion of all, irrespective of age, sex, disability, race, ethnicity, origin, religion or economic or other status

10.3 Ensure equal opportunity and reduce inequalities of outcome, including by eliminating discriminatory laws, policies and practices

and promoting appropriate legislation, policies and action in this regard

10.4 Adopt policies, especially fiscal, wage and social protection policies, and progressively achieve greater equality

10.5 Improve the regulation and monitoring of global financial markets and institutions and strengthen the implementation of such regulations

10.6 Ensure enhanced representation and voice for developing countries in decision-making in global international economic and financial institutions in order to deliver more effective, credible, accountable and legitimate institutions

10.7 Facilitate orderly, safe, regular and responsible migration and mobility of people, including through the implementation of planned and well-managed migration policies

10.a Implement the principle of special and differential treatment for developing countries, in particular least developed countries, in accordance with World Trade Organization agreements

10.b Encourage official development assistance and financial flows, including foreign direct investment, to States where the need is greatest, in particular least developed countries, African countries, small island developing States and landlocked developing countries, in accordance with their national plans and programmes

10.c By 2030, reduce to less than 3 per cent the transaction costs of migrant remittances and eliminate remittance corridors with costs higher than 5 per cent

Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable

11.1 By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums

11.2 By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons

11.3 By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries

11.4 Strengthen efforts to protect and safeguard the world's cultural and natural heritage

11.5 By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations

11.6 By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management

11.7 By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities

11.a Support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning

11.b By 2020, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015-2030, holistic disaster risk management at all levels

11.c Support least developed countries, including through financial and technical assistance, in building sustainable and resilient buildings utilizing local materials

Goal 12. Ensure sustainable consumption and production patterns

12.1 Implement the 10-Year Framework of Programmes on Sustainable Consumption and Production Patterns, all countries taking action, with developed countries taking the lead, taking into account the development and capabilities of developing countries

12.2 By 2030, achieve the sustainable management and efficient use of natural resources

12.3 By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses

12.4 By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment

12.5 By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse

12.6 Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle

12.7 Promote public procurement practices that are sustainable, in accordance with national policies and priorities

12.8 By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature

12.a Support developing countries to strengthen their scientific and technological capacity to move towards more sustainable patterns of consumption and production

12.b Develop and implement tools to monitor sustainable development impacts for sustainable tourism that creates jobs and

promotes local culture and products

12.c Rationalize inefficient fossil-fuel subsidies that encourage wasteful consumption by removing market distortions, in accordance with national circumstances, including by restructuring taxation and phasing out those harmful subsidies, where they exist, to reflect their environmental impacts, taking fully into account the specific needs and conditions of developing countries and minimizing the possible adverse impacts on their development in a manner that protects the poor and the affected communities

Goal 13. Take urgent action to combat climate change and its impacts*

13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries

13.2 Integrate climate change measures into national policies, strategies and planning

13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning

13.a Implement the commitment undertaken by developed-country parties to the United Nations Framework Convention on Climate Change to a goal of mobilizing jointly \$100 billion annually by 2020 from all sources to address the needs of developing countries in the context of meaningful mitigation actions and transparency on implementation and fully operationalize the Green Climate Fund through its capitalization as soon as possible

13.b Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities

* Acknowledging that the United Nations Framework Convention on Climate Change is the primary international, intergovernmental forum for negotiating the global response to climate change.

Goal 14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development

14.1 By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution

14.2 By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans

14.3 Minimize and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels

14.4 By 2020, effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics

14.5 By 2020, conserve at least 10 per cent of coastal and marine areas, consistent with national and international law and based on the best available scientific information

14.6 By 2020, prohibit certain forms of fisheries subsidies which contribute to overcapacity and overfishing, eliminate subsidies that contribute to illegal, unreported and unregulated fishing and refrain from introducing new such subsidies, recognizing that appropriate and effective special and differential treatment for developing and least developed countries should be an integral part of the World Trade Organization fisheries subsidies negotiation²

14.7 By 2030, increase the economic benefits to small island developing States and least developed countries from the sustainable use of marine resources, including through sustainable management of fisheries, aquaculture and tourism

14.a Increase scientific knowledge, develop research capacity and transfer marine technology, taking into account the Intergovernmental Oceanographic Commission Criteria and Guidelines on the Transfer of Marine Technology, in order to improve ocean health and to enhance the contribution of marine biodiversity to the development of developing countries, in particular small island developing States and least developed countries

14.b Provide access for small-scale artisanal fishers to marine resources and markets

14.c Enhance the conservation and sustainable use of oceans and their resources by implementing international law as reflected in the United Nations Convention on the Law of the Sea, which provides the legal framework for the conservation and sustainable use of oceans and their resources, as recalled in paragraph 158 of “The future we want”

² Taking into account ongoing World Trade Organization negotiations, the Doha Development Agenda and the Hong Kong ministerial mandate.

Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

15.1 By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements

15.2 By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally

15.3 By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world

15.4 By 2030, ensure the conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development

15.5 Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species

15.6 Promote fair and equitable sharing of the benefits arising from the utilization of genetic resources and promote appropriate

access to such resources, as internationally agreed

15.7 Take urgent action to end poaching and trafficking of protected species of flora and fauna and address both demand and supply of illegal wildlife products

15.8 By 2020, introduce measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and water ecosystems and control or eradicate the priority species

15.9 By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts

15.a Mobilize and significantly increase financial resources from all sources to conserve and sustainably use biodiversity and ecosystems

15.b Mobilize significant resources from all sources and at all levels to finance sustainable forest management and provide adequate incentives to developing countries to advance such management, including for conservation and reforestation

15.c Enhance global support for efforts to combat poaching and trafficking of protected species, including by increasing the capacity of local communities to pursue sustainable livelihood opportunities

Goal 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

16.1 Significantly reduce all forms of violence and related death rates everywhere

16.2 End abuse, exploitation, trafficking and all forms of violence against and torture of children

16.3 Promote the rule of law at the national and international levels and ensure equal access to justice for all

16.4 By 2030, significantly reduce illicit financial and arms flows, strengthen the recovery and return of stolen assets and combat all forms of organized crime

16.5 Substantially reduce corruption and bribery in all their forms

16.6 Develop effective, accountable and transparent institutions at all levels

16.7 Ensure responsive, inclusive, participatory and representative decision –making at all levels

16.8 Broaden and strengthen the participation of developing countries in the institutions of global governance

16.9 By 2030, provide legal identity for all, including birth registration

16.10 Ensure public access to information and protect fundamental freedoms, in accordance with national legislation and international agreements

16.a Strengthen relevant national institutions, including through international cooperation, for building capacity at all levels, in particular in developing countries, to prevent violence and combat terrorism and crime

16.b Promote and enforce non-discriminatory laws and policies for sustainable Development

Goal 17. Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development Finance

17.1 Strengthen domestic resource mobilization, including through international support to developing countries, to improve domestic capacity for tax and other revenue collection

17.2 Developed countries to implement fully their official development assistance commitments, including the commitment by many developed countries to achieve the target of 0.7 per cent of gross national income for official development assistance (ODA/GNI) to developing countries and 0.15 to 0.20 per cent of ODA/GNI to least developed countries; ODA providers are encouraged to consider

setting a target to provide at least 0.20 per cent of ODA/GNI to least developed countries

17.3 Mobilize additional financial resources for developing countries from multiple sources

17.4 Assist developing countries in attaining long -term debt sustainability through coordinated policies aimed at fostering debt financing, debt relief and debt restructuring, as appropriate, and address the external debt of highly indebted poor countries to reduce debt distress

17.5 Adopt and implement investment promotion regimes for least developed countries

Technology

17.6 Enhance North-South, South-South and triangular regional and international cooperation on and access to science, technology and innovation and enhance knowledge sharing on mutually agreed terms, including through improved coordination among existing

mechanisms, in particular at the United Nations level, and through a global technology facilitation mechanism

17.7 Promote the development, transfer, dissemination and diffusion of environmentally sound technologies to developing countries on favourable terms, including on concessional and preferential terms, as mutually agreed

17.8 Fully operationalize the technology bank and science, technology and innovation capacity-building mechanism for least developed countries by 2017 and enhance the use of enabling technology, in particular information and communications technology

Capacity-building

17.9 Enhance international support for implementing effective and targeted capacity-building in developing countries to support national plans to implement all the Sustainable Development Goals, including through North -South, South-South and triangular cooperation

Trade

17.10 Promote a universal, rules-based, open, non-discriminatory and equitable multilateral trading system under the World Trade

Organization, including through the conclusion of negotiations under its Doha Development Agenda

17.11 Significantly increase the exports of developing countries, in particular with a view to doubling the least developed countries' share of global exports by 2020

17.12 Realize timely implementation of duty-free and quota-free market access on a lasting basis for all least developed countries, consistent with World Trade Organization decisions, including by ensuring that preferential rules of origin applicable to imports from

least developed countries are transparent and simple, and contribute to facilitating market access

Systemic issues

Policy and institutional coherence

17.13 Enhance global macroeconomic stability, including through policy coordination and policy coherence

17.14 Enhance policy coherence for sustainable development

17.15 Respect each country's policy space and leadership to establish and implement policies for poverty eradication and sustainable development Multi-stakeholder partnerships

17.16 Enhance the Global Partnership for Sustainable Development, complemented by multi-stakeholder partnerships that mobilize and share knowledge, expertise, technology and financial resources, to support the achievement of the Sustainable Development Goals in all countries, in particular developing countries

17.17 Encourage and promote effective public, public-private and civil society partnerships, building on the experience and resourcing strategies of partnerships

Data, monitoring and accountability

17.18 By 2020, enhance capacity-building support to developing countries, including for least developed countries and small island developing States, to increase significantly the availability of high-quality, timely and reliable data disaggregated by income, gender, age, race, ethnicity, migratory status, disability, geographic location and other characteristics relevant in national contexts

17.19 By 2030, build on existing initiatives to develop measurements of progress on sustainable development that complement gross domestic product, and support statistical capacity-building in developing countries

<Deliberation progress>

1. A record of the activities of the project were listed in this document so this information will be omitted here.
2. Submitting and deliberation of the final report draft
 - 1) During the Policy Proposal Committee of January 28, 2019, the project leader gave a report on the project's progress and an outline of the results report. A draft of the final report could now be submitted after compiling it while taking into account the comments received from the committee.
 - 2) The final report draft was submitted to the Policy Proposal Committee on April 8, 2019 and the project leader gave a summary of the report to the committee. The committee made several requests. As a result of the deliberation, further comments were sought from the committee concerning the details, and after these were received and the report amended, the report was approved for escalation to the Planning and Management Meeting.
 - 3) On April 17, 2019, The CO, on behalf of the project leader, explained the content outline of the final report, and as a result of the deliberation, the format of the final report was re-arranged before being approved for escalation to the Council.
 - 4) On July 26, 2019, the project leader explained about the outline of the final report draft that was distributed by email to all members of the Council prior to the start of the Council meeting, and as a result of the deliberation, it was approved for public release.

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