UTokyo
CLIMATE ACTION 2025

English

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Foreword

Teruo Fujii

President
The University of Tokyo (UTokyo)

UTokyo Compass, the statement of the guiding principles of the University of Tokyo adopted in 2021, states that, as a university that serves the public good worldwide, we will mobilize knowledge from across all disciplines at our institution to seek solutions to global problems that confront human society.

One of the main challenges we address is the promotion of Green Transformation (GX), for which we are taking action at three levels: global, national, and university. In April 2025, to further strengthen these efforts, we established the UTokyo Center for Strategic Promotion of Green Transformation as a new joint education and research facility within the university. The center is responsible for planning strategies to promote GX, integrating GX initiatives within the university, and presenting a model for future society through the realization of carbon-neutral campuses. Moreover, through collaboration with stakeholders and partners both inside and outside the university, the center aims to expand our on-campus achievements to the local, national, and global levels.

As practical examples of GX at the university level, we have introduced solar power generation, and, beginning in FY2025, we have launched a building carbon management (BCM) plan. This plan utilizes funds raised from UTokyo Compass Bonds to visualize electricity consumption through data at the building and room level, and to promote major energy conservation measures based on this data. The University of Tokyo also possesses vast forests with significant CO_2 absorption capacity. These forests have great value as natural capital, with potential for use as carbon sources in timber and chemical products and for contributions to nature positivity. In collaboration with other universities and companies, we are committed to further developing the value and utilization of these resources.

As a world-class center for education and research responsible for nurturing the next generation of leaders, it is also important that we provide a space where our students, who will shape our future society, can both think about GX as a matter of personal concern and take action. Working together with students, we plan to expand our initiatives throughout society.

Through these efforts, the University of Tokyo will continue to serve as a driving force for global Green Transformation by fostering individuals equipped with both deep specialized expertise and a broad, cross-disciplinary vision to lead that transformation. We will keep working toward our goals through dialogue and collaboration with all stakeholders, both inside and outside the university.

Executive Summary

The University of Tokyo (UTokyo) promotes Green Transformation (GX) to address global environmental crises, placing a particular focus on “Carbon Neutral”, “Nature Positive”, and “Circular Economy” as its core commitments outlined in UTokyo Compass, the university’s guiding principles. The GX promotion structure at UTokyo has been further augmented by the establishment in April 2025 of the Center for Strategic Promotion of Green Transformation (GX), a new university joint education and research institute.

As part of its GX efforts, UTokyo joined the “Race to Zero” campaign mounted by the United Nations Framework Convention on Climate Change (UNFCCC) in October 2021. The participation prompted us to develop the first UTokyo Climate Action (first UTokyo CA), which was released in October 2022. The first UTokyo CA set out mid-term targets to reduce the university’s Scope 1 and 2 CO_2 emissions from 2013 levels by 50% by 2030 and 75% by 2040, as interim steps to achieve carbon neutrality by 2050. The report also laid out systems and policy measures needed to achieve these targets. In addition, the first UTokyo CA included Scope 3 inventory results, the university’s first attempt at calculating Scope 3 emissions, which represent the indirect emissions related to UTokyo’s activities other than its own energy use. It also set out mid- to-long-term targets for Scope 3. For the second and third versions of UTokyo CA, i.e., UTokyo CA 2023 and UTokyo CA 2024, we analyzed the progress against the targets set in the first UTokyo CA. We also showed measures to achieve these targets and made some of these measures more concrete. UTokyo CA 2025 (this document) reports on progress in implementing measures to reduce Scope 1 and 2 emissions. It also defines plans for achieving the interim targets by fiscal 2030. As for the pending issues concerning Scope 3 accounting, UTokyo CA 2025 reports on the outcomes of our efforts to utilize various on-campus activity data.

Scope 1 and 2 emissions in fiscal 2024 (based on the current calculation method) amount to approx. 165,000 $MTCO_2e$ in terms of energy-related emissions only and to approx. 167,000 $MTCO_2e$ if non-energy-related emissions (air conditioner refrigerant leakage) are also included. Energy-related emissions are up 2.0% from fiscal 2023 and down 16.3% from fiscal 2013. The increase from fiscal 2023 is attributable to two factors. One is a slight growth in town gas consumption at the University Hospital and elsewhere. The other is a 2.1% increase in TEPCO’s emission factor (unadjusted emissions factor, see Section 2.3) although university-wide electricity consumption remained almost flat (down 0.1%). We are working to achieve the 2030 reduction target in two aspects: energy demand and energy supply. For the former, we are continuing to retrofit our buildings to enhance their energy efficiency under the TSCP promotion program. We are also planning to introduce building carbon management (BCM) for 30 buildings in Hongo from this fiscal year while taking advantage of the UTokyo Compass Bond (sustainability bond). For the latter, we are planning off-site solar power generation in remote developments in addition to emission reductions with on-site solar power generation. Because these new plans will take some time to steadily produce reduction effects, we will also consider deploying renewable energy based on a power contract.

Scope 3 emissions are estimated to account for over 70% of total emissions from UTokyo, according to the inventory results of the first UTokyo CA. To reduce these emissions, the UTokyo Climate Action Working Group (UTokyo CA-WG), made up of LCA-related faculty members, has been looking into devising measures to refine calculations and effectively reduce emissions. For measures to refine calculations, UTokyo CA-WG has been addressing two issues: (i) how to utilize a new financial accounting system to be applied from fiscal 2027, and (ii) how to complement inventory results with activity data in addition to financial and accounting data. As for measures to effectively reduce emissions, we partially revised calculations for fiscal 2013, the baseline year, as well as for the most recent three-year period (fiscal 2022 to fiscal 2024). To this end, we used hospital pharmaceutical management data, management data on fixed

assets and small-sum equipment, and travel expense data in addition to waste data, which was used in the previous fiscal year as well. The result was lower Scope 3 estimates, down 15% for fiscal 2024. The decrease was due both to factor revisions for pharmaceuticals and to the reclassification of travel expenses. However, there are still many challenges in utilizing primary data to better reflect reduction efforts. We will continue to address these challenges. Emissions from business travel were addressed in fiscal 2024 by the Carbon Offset Task Force under the Institute for Future Initiatives (IFI). In fiscal 2025, IFI launched in-house efforts to reduce such emissions on an experimental basis.

UTokyo's Climate Action aims not only to reduce GHG emissions caused by its own activities but also to contribute to carbon neutrality of society as a whole through research and education.

Particularly, taking leadership in driving green transformation in Japan and the world is an important mission for a university serving the public good. To give some examples of actions taken by UTokyo, the Center for Global Commons of the Institute for Future Initiatives has been taking a lead in building an international network of collaboration and a shared platform with leading Japanese companies.

The development of technologies essential to carbon neutrality and research on social institutions that are crucial to support it are conducted at many UTokyo departments and divisions, as well as at the Collaborative Research Organization for Comprehensive Energy Sciences, the Center for Climate Solutions, and the UTokyo LCA Center for Future Strategy. In addition, we signed collaboration agreements with Hokkaido University, Akita Prefectural University, and the Sumitomo Mitsui Financial Group to utilize the value of the vast forests owned by UTokyo (university forests) as a natural capital.

Our initiatives in education involve expanding our educational programs so as to provide everyone from newly enrolled students to working adults with opportunities to learn about green transformation (GX) in various fields. A case in point is the Fostering Advanced Human Resources to Lead Green Transformation (SPRING GX) project launched in 2021. Now, some 1,300 doctoral students are participating in the SPRING GX project. To upgrade relevant educational programs for undergraduate junior division students, we started an integrated course titled "Climate Change and Society" in fiscal 2025 for new first- and second-year students to replace the Academic Frontier Lecture Series on "Climate and Society."

The ambitious targets set up by UTokyo will require the commitment of all students and staff from the university. To enhance collaboration with the students, who make up the largest part of UTokyo's membership, the GX Student Network (GXSN) was launched in 2023. GXSN is actively expanding its scope of activities by collaborating with other universities and launching new projects.

We are also continuing to promote collaboration with the communities where our campuses are located. In particular, under a collaboration agreement signed in 2024, we are working with Bunkyo Ward, where our Hongo Campus sits, in sharing knowledge gained at the university to local communities.

Going forward, UTokyo will promote emissions reduction activities in cooperation with various stakeholders, including external partners. An annual review of the UTokyo CA will be made to check progress and update actions.

UTokyo Climate Action 2025 updates the activities in the latter half of fiscal 2024 and the first half of fiscal 2025. (It also provides some information for periods preceding and following this period.) GHG emissions data in UTokyo CA 2025 cover data up to fiscal 2024.

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About UTokyo Climate Action

Climate change is undoubtedly one of the most pressing sustainability challenges that we currently face, and urgent action is imperative.
Given these circumstances, UTokyo has positioned Green Transformation (GX) as one of the pillars of its action plan.
At the same time, it has joined the “Race to Zero” campaign in response to the call of the United Nations Framework Convention on Climate Change (UNFCCC).
In relation to this campaign, the then GX Promotion Subcommittee, which coordinated activities related to GX, drew up UTokyo Climate Action (UTokyo CA) in October 2022, which included the targets necessary to achieve net zero greenhouse gas (GHG) emissions from the university’s activities by 2050.
UTokyo CA is updated annually based on progress in GX activities within the university as well as on changes in circumstances.
Starting from fiscal 2025, updates are made by the newly established Center for Strategic Promotion of GX in place of the GX Promotion Subcommittee.

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Background

The climate emergency urgently requires global and regional actions. The Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) highlights the magnitude and severity of the coming challenges. According to the IPCC, the average global temperature has already increased by around 1°C compared to pre-industrial levels, with some regions warming faster. The IPCC report also states that climate change is clearly a human-induced phenomenon, which is already causing severe environmental and social impacts. In fact, the years 2023 and 2024 saw frequent cases of various natural disasters, including heat waves, droughts, large-scale floods, and wildfires. In 2024, the global average temperature was 1.55°C above the pre-industrial level, making 2024 the first calendar year to experience an increase of more than 1.5°C, the limit established by the Paris Agreement.[1]

The need for additional climate actions is evident, and rapid improvement is necessary. The IPCC states that aggressive measures to ensure that global cumulative GHG emissions will peak by 2040 will help mitigate climate impacts and avoid social and ecological catastrophes.

At national and international levels, there is a need to follow the Paris Agreement, a legally binding international agreement on climate change that was adopted by 196 parties at the COP21 in Paris on December 12, 2015 and put into effect on November 4, 2016. It aims to limit global warming to below 2°C, preferably 1.5°C, compared to pre-industrial times.

Countries must reach the global greenhouse gas (GHG) emissions peak as soon as possible and achieve a climate-neutral world by mid-century.

In response to the Paris Agreement, Japan updated its Nationally Determined Contribution (NDC) for 2030 in 2021 to commit to a 46% reduction in emissions from 2013 levels, with "continued challenging efforts" toward even a 50% reduction. In February 2025, Japan announced yet another new NDC with ambitious GHG reduction targets: 60% by fiscal 2035 and 73% by fiscal 2040 from fiscal 2013 levels. These targets position the nation on a straight pathway toward the achievement of net zero by 2050.[2]

With the formulation of the new NDC, the Strategic Energy Plan has also been revised.[3] The revised plan projects a power generation mix of 2040 as renewable energy: 40–50%; nuclear power: 20% (unchanged); and thermal power: 30–40%. (The 2021 Strategic Energy Plan aimed to raise the proportion of renewable energy to 36–38% by 2030.)

As a global megacity, the Tokyo Metropolitan Government (TMG) declared its goal of becoming a "Zero Emission Tokyo" at the U20 Tokyo Mayors Summit in May 2019. TMG aims for net zero CO_2 emissions by 2050 to help limit the increase in global average temperature to 1.5°C. TMG has also formulated the Zero Emission Tokyo Strategy, which outlines a vision, specific measures, and a roadmap to realize this goal.

The strategy comprehensively sets out both mitigation measures to halt climate change and adaptation measures to brace for already-happening impacts of climate change. It also fully integrates sustainable resource management into TMG's climate change policies to help reduce CO_2 emissions outside Tokyo. The following paragraphs discuss some initiatives toward system revisions that pertain to the Tokyo Metropolitan Environment Security Ordinance.

TMG recognized that actions to be taken till 2030 will be critical to the achievement of a Zero Emission Tokyo by 2050. Based on this premise, the government in 2022 announced "Carbon Half," a plan to halve greenhouse gas emissions by 2030. The plan requires large-scale business establishments in Tokyo to reduce their total CO_2 emissions. It also calls for the development of a cap-and-trade program aimed at achieving their reduction targets. The program will allow such establishments to purchase surplus emission credits from other establishments through emissions trading so that they can meet their requirements. In September 2022, TMG revised the Tokyo Environmental Master Plan to set out specific targets and measures. In October 2023, it amended the Tokyo Metropolitan Environment Security Ordinance and its enforcement regulations. The aim was to identify the requirements for GHG emissions reduction from fiscal 2025 to fiscal 2029 and to show how the cap-and-trade program will be implemented.

In March 2025, TMG announced the "Beyond Carbon Half" strategy, which set a new goal of reducing GHG emissions by 60% or more from 2000 levels by 2035, as well as 31 targets in such policy areas as making renewables as a core energy source.[4]

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1 WMO press release on January 10, 2025
https://wmo.int/news/media-centre/wmo-confirms-2024-warmest-year-record-about-155degc-above-pre-industrial-level

2 Japan's Nationally Determined Contribution (February 18, 2025) is available at the following website of the Ministry of the Environment.
https://www.env.go.jp/content/000291805.pdf

3 Japan's Strategic Energy Plan (February 18, 2025) is available at the following website of the Agency for Natural Resources and Energy, Ministry of Economy, Trade and Industry.
https://www.enecho.meti.go.jp/en/category/others/basic_plan/

4 TMG Bureau of Environment, "Zero Emission Tokyo Strategy: Beyond Carbon Half"
https://www.kankyo.metro.tokyo.lg.jp/policy_others/zeroemission_tokyo/strategy_beyond_carbonhalf (in Japanese)

Given these circumstances, UTokyo has positioned Green Transformation (GX) as one of the pillars of its action plan in the UTokyo Compass and established the GX Promotion Subcommittee in 2022 under the Future Society Initiative (renamed “UTokyo Compass Initiative” in fiscal 2024) to promote GX. At the same time, UTokyo has responded to the call of the United Nations Framework Convention on Climate Change (UNFCCC) to join the “Race to Zero for Universities and Colleges” (hereinafter “Race to Zero”) campaign, which is committed to reduce its GHS emissions to net zero by 2050. As a result, UTokyo has become the first Japanese national university to join the campaign.

In fiscal 2025, UTokyo established the Center for Strategic Promotion of GX to replace the GX Promotion Subcommittee. The Center took over the initiatives related to this campaign. It aims to promote the creation of UTokyo-led social transformation models (to be applied at the local, national, and global levels) as a key strategy. This model creation is covered by the university’s priority investment program.

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Vision

Mission of UTokyo

The University of Tokyo (UTokyo) aims to be a world-class platform for research and education that contributes to human knowledge in partnership with other leading global universities. At the same time, UTokyo aims to nurture global leaders with a strong sense of public responsibility and a pioneering spirit, and those who possess both a deep specialty and extensive knowledge. It aims to expand the boundaries of human knowledge in partnership with society.

UTokyo's Commitment to Climate Change

Climate Change is undoubtedly one of the most pervasive sustainability challenges that we currently face. The IPCC's recent Sixth Assessment Report has clearly articulated that the scale of recent changes in the climate system as a whole has been unprecedented and more rapid than previously predicted. In the past five decades the change in air temperature has been more rapid than at any other such period in the last two thousand years; sea level rise has also increasingly accelerated during the last century, faster than at any point in the last several thousands of years. We do not know how much longer our planet and our societies can withstand the grave consequences of global warming. Thus, urgent action is imperative.

Green Transformation (GX)

The guiding principles of UTokyo in the UTokyo Compass, which was made public on September 30, 2021, stated that UTokyo has positioned Green Transformation (GX) as one of the pillars of its action plan.

UTokyo's GX aims to reform the social and economic system to a regenerative one that will not exceed the planetary boundaries, while ensuring an equitable transition, as a means to realize a sustainable and inclusive society where everyone can live happily and with dignity. It places a particular focus on carbon neutrality, nature positivity[5] and circular economy as the most important pillars of the initiative. (see Figure 1)

UTokyo is now accelerating specific initiatives, such as the formulation of a roadmap for UTokyo as a business entity to achieve net zero greenhouse gas emissions, and collaboration with the local communities where its campuses are located. The University of Tokyo (UTokyo) aims to be a world-class platform for research and education that contributes to the promotion of GX through such initiatives as creating knowledge foundation and leading international GX, presenting a future society model by achieving a carbon neutral campus, partnering with businesses, municipalities, other universities and the civil society, and nurturing global leaders.

UTokyo Climate Action is positioned as the core initiative for achieving carbon neutrality among the three pillars of GX. The three pillars, however, are closely interrelated with each other. For instance, measures to fight climate change could become a tradeoff for biodiversity. Paying due consideration to such interrelations, UTokyo will lead an international green transformation informed by scientific expertise that mobilizes the comprehensive knowledge generated in UTokyo.

Specifically, it aims to develop mechanisms for the better management of stable global systems as the shared property of all humankind (global commons), through the Global Commons Stewardship Initiative, an international collaborative project. Moreover, it aims to convene the Energy Transitions Initiative - Center for Global Commons (ETI-CGC) as an industry-academia collaborative platform to discuss pathways and policies for Japan to achieve decarbonization (net zero greenhouse gas emissions) by the middle of this century, and contribute to the transformation of Japanese society from a scholarly perspective.

UTokyo also aims to decarbonize the activities of its entire organization. Specifically, based on a roadmap toward the goal of halving the university's effective CO_2 emissions by 2030 as against the 2013 figure, we will clarify and implement the systems and policy measures required to achieve this goal. UTokyo will also collaborate with the international society as a participating institution in the international "Race to Zero" campaign that promotes action to reach effectively zero greenhouse gas emissions by 2050.

With respect to education, we will launch educational programs at all levels to expose all students to GX and improve their GX literacy. This will be done by offering more lectures for undergraduate students in addition to graduate-level programs for developing advanced human resources such as the Graduate Program in Sustainability Science Global Leadership Initiative (GPSS-GLI) and Fostering Advanced Human Resources to Lead Green Transformation (SPRING GX).

As for partnership and co-creation, we will deploy activities involving various campus members including faculty, staff, and students. We will also work on GX initiatives with local governments, residents, businesses, and whole communities in the areas home to UTokyo's campuses and facilities, which occupy

5 Halting and reversing biodiversity loss to put nature on a path to recovery

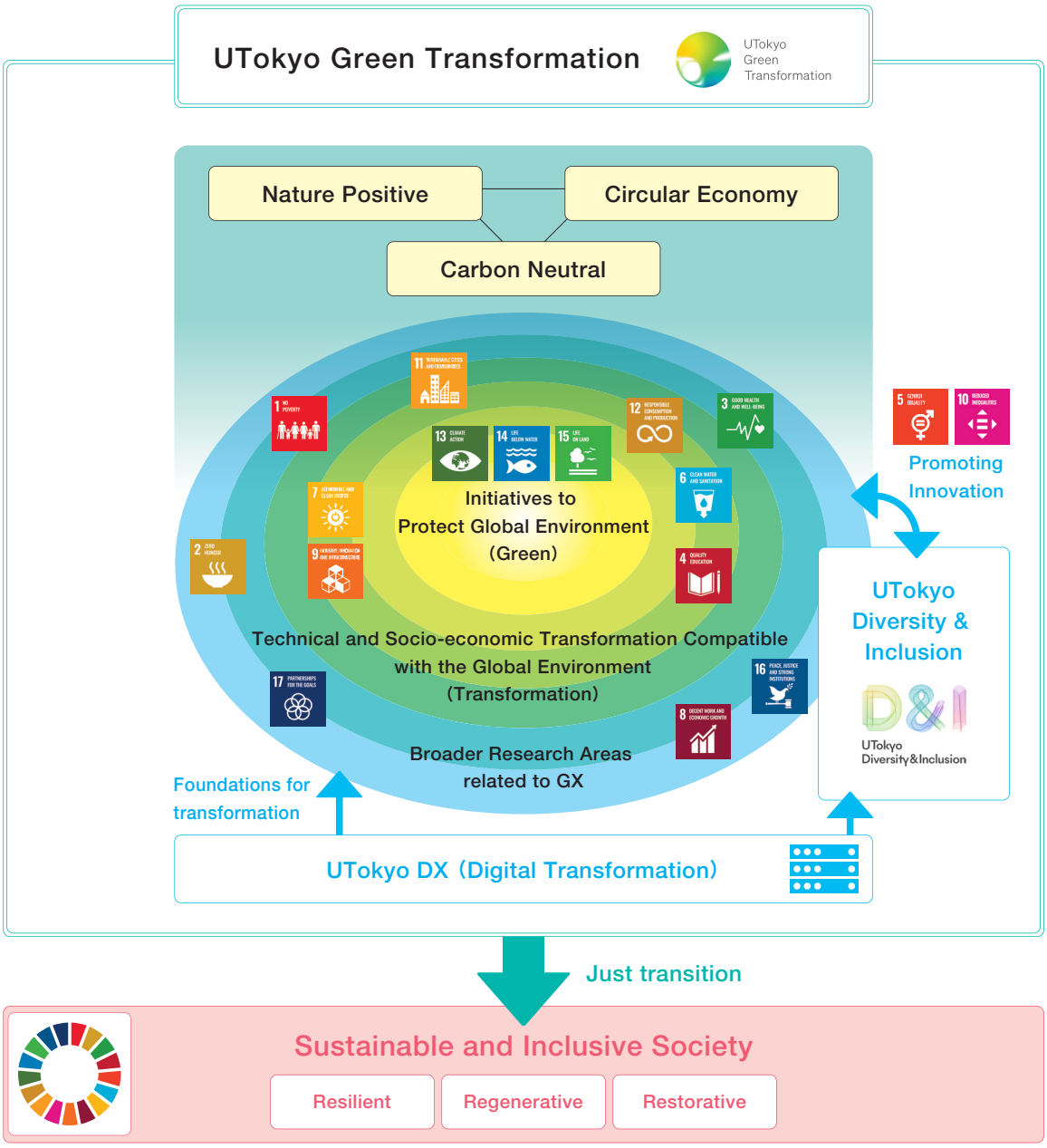

Figure 1 Conceptual Diagram of UTokyo Greem Transformation

approximately 0.1% of Japan's total land area. We will work more closely with universities and businesses in Bunkyo Ward, where our Hongo Campus is located, under the collaboration agreement we signed with this municipality in 2024. We will also work with other universities and businesses to put our university forests to good use as natural assets.

Purpose and Targets to Achieve

Table 1 GHG Reduction Targets for the Japanese Government and the Tokyo Metropolitan Government

Target year	Japanese government[6]		Tokyo Metropolitan Government[7]	
	Target	Baseline year	Target	Baseline year
By 2030	46%	2013	50%	2000
By 2035	60%		60%	
By 2040	73%		—	
By 2050	100%		100%	

The purpose of UTokyo Climate Action (CA) is to visualize and embody the roadmap to Net Zero GHG emissions. It is an operational planning document that embodies UTokyo's vision and should be continuously revised and updated by implementing the PDCA cycle and verifying the results of the actions.

The purpose of UTokyo CA is to:

- Anticipate and respond to future national and international regulations related to climate change
- Reduce UTokyo's greenhouse gas (GHG) emissions to effectively net zero
- Promote GHG emissions reductions in other universities, surrounding municipalities and businesses
- Implement a circular economy model in UTokyo context
- Further improve the quality of education and research by taking action on Climate Change
- Keep providing research results that contribute globally to the achievement of carbon neutrality

The implementation of UTokyo CA not only aims to achieve the GHG emissions reduction targets but also considers the reduction of the medium- to long-term operational costs associated with climate change mitigation, so that the pathway towards meeting the goals set up in the Paris Agreement can be a financially sustainable one.

The scope of UTokyo CA includes emission reductions through renewable energy supply, efficiency improvement, green procurement, and some other Scope 3 category (e.g., business travel, waste, etc.) reduction actions. It includes buildings and assets which the university has operational control over. Some climate actions are already underway, while others require further data collection and analysis, and discussions with various stakeholders.

In developing UTokyo CA in connection with the university's participation in the "Race to Zero" campaign, the GX Promotion Subcommittee referred to and reviewed the timelines for GHG reduction developed by the Japanese government6 and the Tokyo Metropolitan Government7 (see Table 1) as well as climate action plans of several peer universities, to set the targets for UTokyo.

To make the work to achieve carbon neutrality more manageable, the UTokyo CA implementation process is divided into 3 phases. A summary of the GHG reduction targets associated with each phase is provided below (Table 2). These phases are designed to complement each other, with the earlier phases designed to lay the groundwork for the more ambitious projects in the later phases. They also include actions for reducing Scope 3 emissions.

While steadily implementing the Scope 1 and 2 emissions reduction actions defined in UTokyo CA, we are currently deepening discussions on actions for mitigating and adapting to climate change. Actions for reducing Scope 3 emissions are also being considered as they will require the engagement of other parties outside of UTokyo. However, in order to develop concrete actions to reduce Scope 3 emissions and to predict the quantitative effects of such actions, many barriers need to be overcome, including constraints of available data, diversity of the education and research of university members, and lack of mechanisms for involving product and service suppliers.

6 Ministry of the Environment, "Japan's Nationally Determined Contribution," October 22, 2021 (see also footnote 2 on page 7.)
https://www.env.go.jp/content/000290589.pdf (in Japanese)

7 Zero Emission Tokyo Strategy (see also footnote 4 on page 7)
https://www.kankyo.metro.tokyo.lg.jp/documents/d/kankyo/outline-of-zero-emission-tokyo-strategy

Table 2 UTokyo Reduction Targets by Scope and Phase

Phase	Baseline	Reduction Target (Scope 1,2)	Reduction Target (Scope 3)	Target year
Phase 1	2013	50%	25%	By 2030
Phase 2	2013	75%	50%	By 2040
Phase 3	2013	100%	75%	By 2050

Table 3 GHG Reduction Targets Specified in TSCP and the Tokyo Metropolitan Environment Security Ordinance

TSCP CO_2 reduction targets	Reduction targets specified in the Tokyo Metropolitan Environmental Security Ordinance[8]
TSCP 2023: 18% reduction by 2023 against fiscal 2017	Halve emissions in the fourth plan period (fiscal 2025-2029) compared to the baseline level (average of 3 consecutive years up to 2010)
TSCP 2030: 50% reduction by 2030 against baseline (2006)	

Accordingly, we have been reviewing our calculation methods to monitor emission reductions since last fiscal year. Going forward, we will work on visualization of reduction results while continuing working on reduction.

UTokyo CA was first revised in 2023 and will continue to be revised every year for the purpose of ensuring that the GHG emissions reduction targets will be met by reviewing the effects of all the climate actions implemented in each phase and reflecting the results to improve or devise additional actions.

UTokyo also maintains the GHG reduction targets set by the University of Tokyo Sustainable Campus Project (TSCP), which started its activities in 2008, as well as the targets shown in Table 3 (targets based on the mandatory reduction targets as specified in the Tokyo Metropolitan Environmental Security Ordinance). Although these targets differ from the targets set out in UTokyo CA in terms of baseline years and electricity emissions factors, UTokyo will formulate a roadmap of actions to reduce GHG emissions toward 2030 to meet both the reduction targets specified in the Tokyo Metropolitan Environmental Security Ordinance and UTokyo CA targets. For more details, please refer to Section 3.1-3.3 below.

Progress on the targets set by TSCP is reported in the annual UTokyo Environmental Report.
https://www.u-tokyo.ac.jp/ja/about/actions/public05.html (in Japanese)

8 Revised on October 13, 2023
https://www.kankyo.metro.tokyo.lg.jp/climate/large_scale/overview/4th_overview/outline.html (in Japanese)

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Organization Structure and Roles

UTokyo CA used to be developed and updated by the GX Promotion Subcommittee, an organization under the UTokyo Compass Initiative. In April 2025, the Center for Strategic Promotion of GX was established, and the responsibility was transferred to the Center. Figure 2 shows the organization chart of the Center for Strategic Promotion of GX.

The Center for Strategic Promotion of GX is a university joint education and research institute made up of its director, two full-time faculty members, and 26 adjunct faculty members (as of September 2025). The Center also has a management strategy function and is responsible for the formulation and promotion of university-wide GX strategies. Its mission is to use the campus as a "living laboratory" and develop the outcomes generated on campus to the regional, national, and global levels.

- Reducing CO_2 emissions and procuring green energy
- Improving the accuracy of estimating CO_2 uptake by forests and oceans
- Conserving and visualizing biodiversity

Green Transformation Strategy Office is responsible for planning GX promotion strategies and for integrating on-campus GX promotion activities. The Office works with internal and external stakeholders and partners, including departments, divisions, and students in the university, to promote GX-related activities.

The Campus Management Office is responsible both for presenting future society models through the promotion of broader campus GX and for practicing GX promotion on campus. The Office promotes energy conservation activities by capitalizing on the planning function of TSCP activities as well as on building carbon management (see Section 3.2 for details). UTokyo CA WG also works under the Campus Management Office.

The final draft of UTokyo CA 2025 was examined by UTokyo CA-WG, reviewed by the Campus Management Office of the Center for Strategic Promotion of GX, and finally approved by the director of the Center.

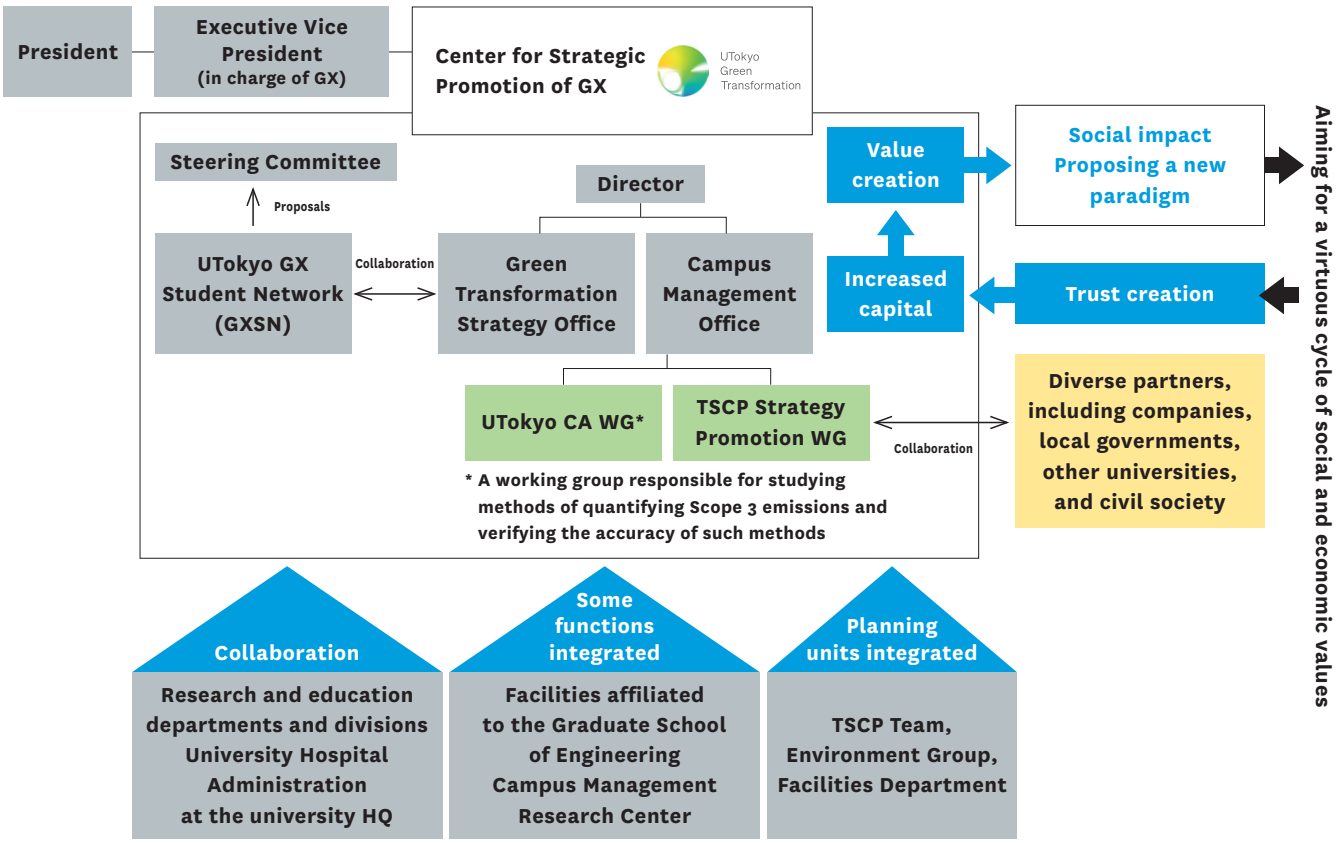

Figure 2 Structure of the Center for Strategic Promotion of GX

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UTokyo GHG Inventory

As a participating institution in the Race to Zero campaign,
UTokyo prepares a GHG inventory and publishes the results in UTokyo CA every year.
UTokyo CA 2025 contains the results of the university's GHG inventory up to fiscal 2024.
In order to accurately assess the amount of GHG reduction, it is essential to refine the calculation methods,
and thus improvement of the data collection techniques is also important.
Accordingly, these calculation methods are revised in some respects in UTokyo CA 2025.
Our initiatives to improve the calculation approach will be reported in yearly updated issues of UTokyo CA.

The University of Tokyo (UTokyo) GHG inventory is compiled in alignment (where applicable) with the GHG Protocol.[9] UTokyo adopts the operational control approach to assess its GHG emissions.

Emission Sources

The GHG protocol classifies GHG emissions according to the following three scopes.

■ Scope1

This scope represents on-site direct GHG emissions mainly from fuel consumption. GHG emitted as a result of fuel consumption on UTokyo's various locations and use of vehicles falls under this category. In the case of UTokyo, GHG from the consumption of town gas and heavy fuel oil accounts for most of its Scope 1 emissions. Starting from its 2024 issue of UTokyo CA, we assess non-energy-related Scope 1 emissions, such as emissions caused by air-conditioner refrigerant leakage.

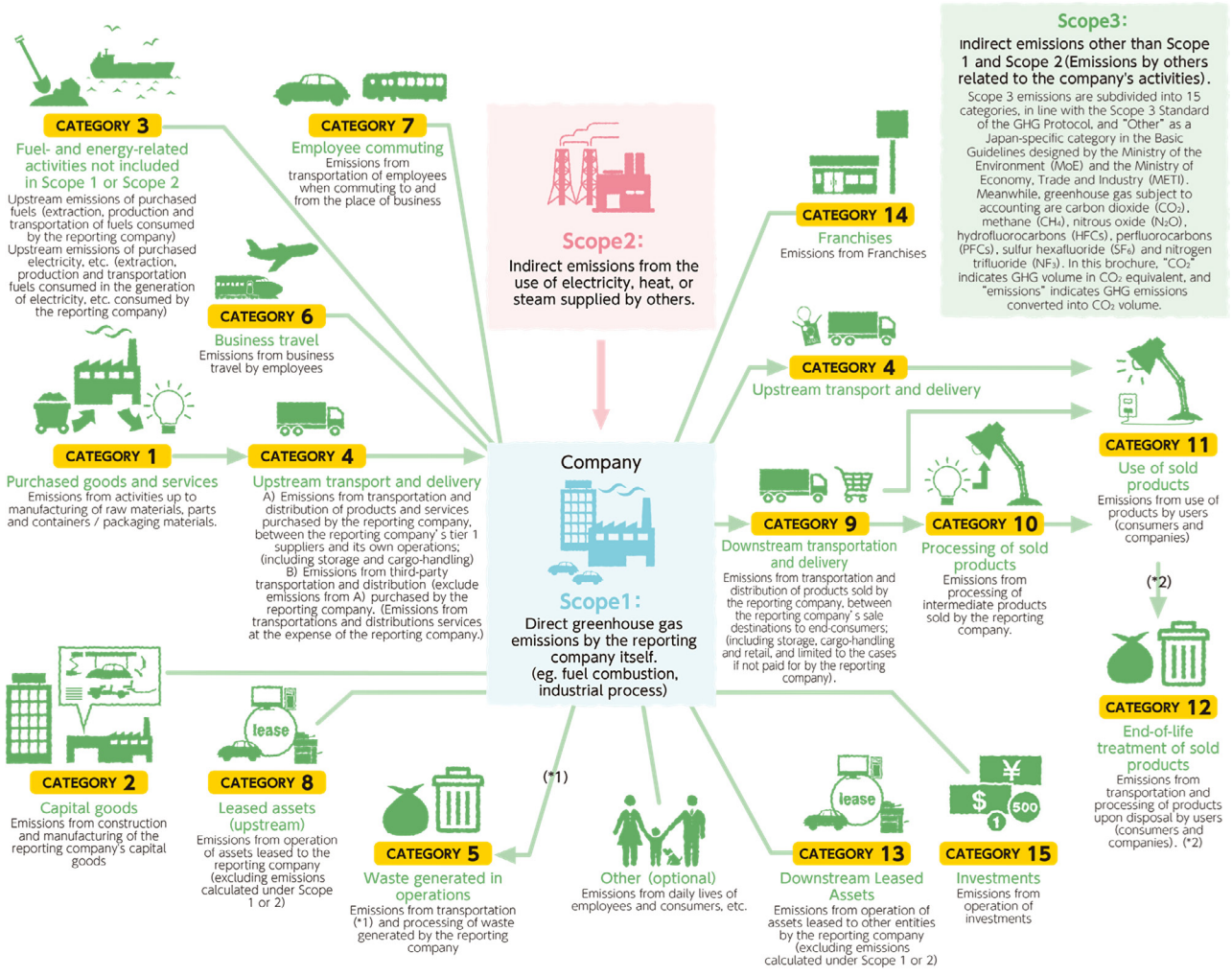

Figure 3 Schematic Diagram of Scopes 1, 2 and 3 in the Value Chain[10]

9 WRI WBCSD, Greenhouse Gas Protocol A Corporate Accounting and Reporting Standard REVISED EDITION
https://ghgprotocol.org/corporate-standard

10 MOE webpage "What is 'Supply-chain emissions'"
https://www.env.go.jp/earth/ondanka/supply_chain/gvc/en/supply_chain.html

Scope2

UTokyo's emissions under this scope represent on-site electricity consumption.

Scope3

This scope represents emissions that are induced by UTokyo's activities and occur either upstream or downstream. Emission sources are typically not owned or controlled by UTokyo. Scope 3 emissions refer to those emissions that are not included in Scope 1 or 2, and occur in the supply chain of purchased goods and services, infrastructure acquired by UTokyo, business travels, staff and student commuting, waste treatment, other fuel- and energy-related activities (such as, mining, refining and transport of energy), and so on.

Figure 3 shown below is an image created by the Ministry of the Environment (MOE) based on the GHG protocol to illustrate the sources of the three scopes and the 15 categories under Scope 3, as well as their relations in the supply chain.

Global Warming Potential

Global warming potential values from IPCC 2021 GWP 100a (see Table 4) were used, in principle, to obtain the greenhouse effect for different substances.

Table 4
100-Year Global Warming Potentials (CO_2 Conversion Factors) of Main GHGs (IPCC 2021)[11]

Greenhouse gases	Chemical formula	100-year GWP
Carbon dioxide	CO_2	1
Methane (fossil)	CH_4	29.8
Methane (biogenic)	CH_4	27
Nitrous oxide	N_2O	273
Hydrofluorocarbons (HFCs)	Various	Various
Perfluorocarbons (PFCs)	Various	Various
Sulfur hexafluoride	SF_6	24300

11 IPCC, Climate Change 2021: The Physical Science Basis. Working Group I Contribution to the IPCC Sixth Assessment Report https://www.ipcc.ch/report/ar6/wg1/

Scope and Boundary

Reporting Period, Organizational Boundary and Scopes

As of September 2025, UTokyo has 48 domestic locations, and 26 overseas locations.[12] There are five main campuses in Japan: Hongo, Komaba 1, Komaba 2, Shirokanedai, and Kashiwa, with Hongo being the largest campus, where the university hospital is also located. Due to the lack of detailed data to calculate GHG emissions for all locations and facilities, the calculation of GHG emissions related to activities at the University of Tokyo after fiscal 2006 is limited to Scope 1, 2, and 3 for locations in Japan (after fiscal 2009 for locations other than the five main campuses), and Scope 3 only for overseas locations (emissions related to Scope 1 and 2 are presumably included).

Financial information used to assess the GHG inventory for Scope 3 emissions covers all funds that are managed by UTokyo's budget.

Other Boundaries and Exclusions

The following items are still not included in the calculation, as relevant information on their emissions is still lacking. We will keep examining their inclusion in future assessments.

- Emissions associated with student commuting
- Emissions associated with students attending online classes and staff working remotely at home
- Emissions associated with some activities as an educational and research institution including investments made by UTokyo

12 UTokyo locations in Japan and overseas
https://www.u-tokyo.ac.jp/ja/about/campus-guide/national.html (in Japanese)
https://www.u-tokyo.ac.jp/ja/intl-activities/overseas-offices/list_of_overseas_offices.html (in Japanese)

Calculation Methodology

Calculation Flow

GHG emissions were calculated by multiplying activity data by the emission factor associated with the activity in question.

Figure 4 below roughly outlines the flow of GHG emissions calculation.

Emission Factors

- Scope 1 emissions factors are obtained from the "Greenhouse Gas Emissions Calculation, Reporting, and Disclosure System"[13] and applied. It should be noted however the emission factors for town gas were partially revised this fiscal year, causing slight effects on the estimates for all fiscal years (e.g., emissions from town gas were approximately 8% lower, or a decrease of approx. 1,700 $MTCO_2e$ for fiscal 2013).
- For Scope 2 emissions factors, the unadjusted emissions factor[14] for each year is obtained from TEPCO[15] and applied. For fiscal 2013 (baseline year), fiscal 2023, and fiscal 2024, location-based and market-based calculations are made, and the corresponding emission factors are used. (See the next section.)
- Scope 3 emission factors were mostly obtained from LCA database IDEA Ver. 3.5,[16] with some supplemented by referring to the emission factors of the Green Value Chain Platform.[17]

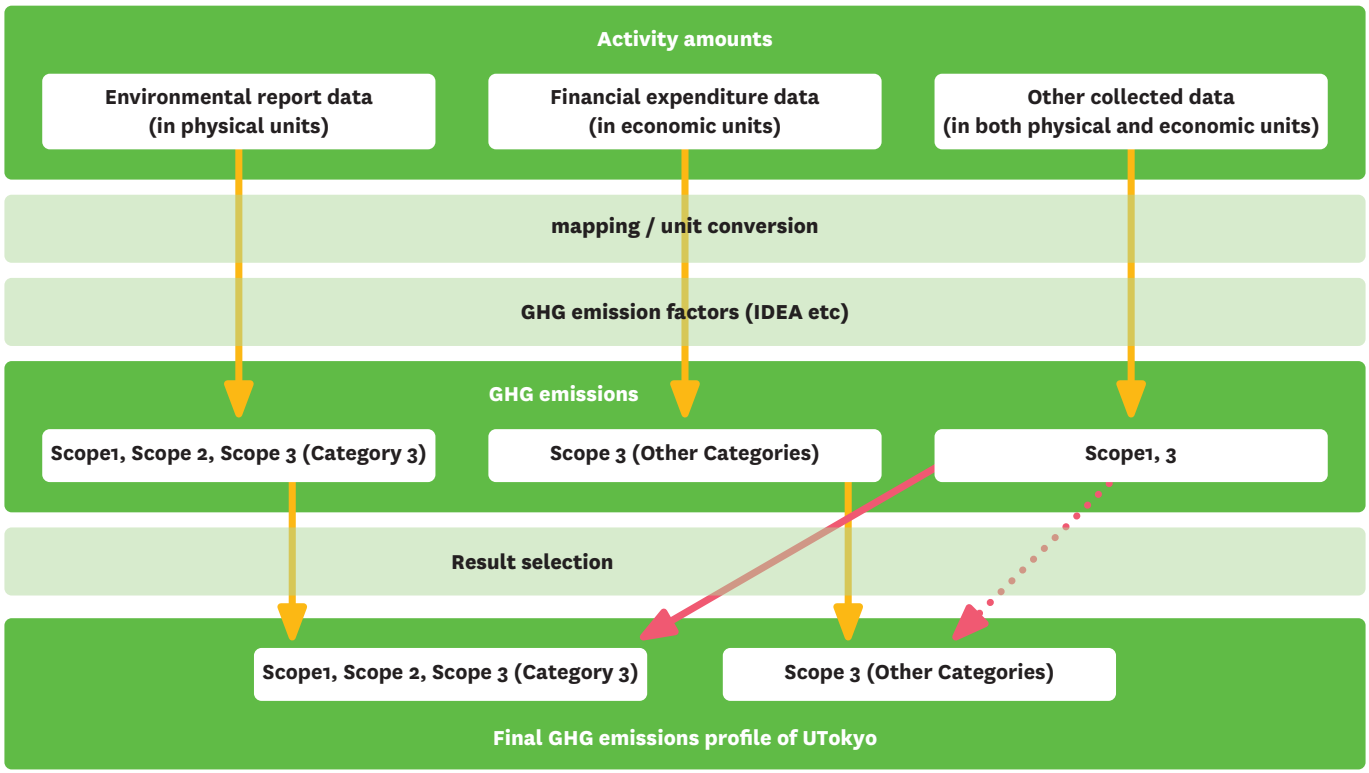

Figure 4 GHG Emissions Calculation Flow

13 Ministry of the Environment (MOE), List of Emissions Factors
https://policies.env.go.jp/earth/ghg-santeikohyo/calc.html (in Japanese)

14 Previously called the "basic emission factor." Changed to the current term in fiscal 2025 (see page 8 of the document below)
https://policies.env.go.jp/earth/ghg-santeikohyo/files/about/changes_2025_rev2.pdf (in Japanese)

15 TEPCO, "Changes in CO_2 emission factors, etc."
https://www.tepco.co.jp/ep/company/warming/keisuu (in Japanese)

16 LCI Database IDEA Ver. 3.5 (April 21, 2025)
Research Laboratory for IDEA, Research Institute of Science for Safety and Sustainability (RISS), National Institute of Advanced Industrial Science and Technology (AIST)

17 Ministry of the Environment (MOE) and Ministry of Economy, Trade and Industry, "Green Value Chain Platform Emission Intensity Database Ver 3.5"
https://www.env.go.jp/earth/ondanka/supply_chain/gvc/estimate_05.html (in Japanese)

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Improvement of Limitations and Data Gaps

Due to problems pertaining to data collection, the current calculation method has various limitations. We are currently trying to eliminate these limitations starting from where we can.

- For Scope 1 emissions, we calculate the impact of the direct release of chemical substances (air conditioner refrigerants, solvents used in experiments, etc.) into the atmosphere starting from UTokyo CA 2024. For air conditioner refrigerants, we used the leakage amount reported under the Act on Rational Use and Proper Management of Fluorocarbons; for the atmospheric release of methylene chloride, chloroform, and other chemical substances used in experiments, we used the emission data collected under the PRTR Act and applied the global warming potential values from IPCC 2021 GWP 100a. Please note that no calculations have been made for fiscal 2018 and earlier, including the baseline year (fiscal 2013), as data were not fully available.
  Due to the limitations in data collection, the following data gaps still exist in the Scope 1 GHG emissions data. We will continue to explore ways for improvement.
  ► Fuel consumption data of vehicles owned by UTokyo are only available for vehicles registered in the Tokyo metropolitan area. Therefore, fuel consumptions of vehicles registered in other prefectures are not included.
  ► Fuel consumption data for overseas locations are not included.
- From the viewpoint of ensuring consistency and continuity, up to fiscal 2023, Scope 2 GHG emissions were calculated using the unadjusted emissions factor (known as “basic emission factor” until last fiscal year) announced by TEPCO for the relevant year as the carbon intensity of electricity. Although UTokyo’s five main campuses are located within TEPCO’s service area, we consume large amounts of electricity at sites outside of TEPCO’s service area as well. Also, “100% effectively renewable energy” options have been introduced at Kashiwa II Campus. Considering these facts, we made market-based calculations using different emission factors specific to regional grids and power options—a practice from UTokyo CA 2024 onward. We also performed location-based calculations for comparison. By comparing the results of these three calculation methods, we verify whether we can ensure continuity and validity by using these methods. We used the latest electricity emission factors available for the calculation of emissions for fiscal 2024. Specifically, we used the preliminary fiscal 2024 emission factors announced by TEPCO, and for location-based factors, we used MOE’s fiscal 2023 figures. For market-based factors, we used the latest preliminary figures announced by power companies including TEPCO. For some companies that do not announce preliminary figures, we applied MOE’s fiscal 2023 figures.
- For Scope 3 Category 3, we use emission factors prepared by IDEA starting from last fiscal year.
- We mainly use the spend-based method to calculate each Scope 3 item. That is, we classify and aggregate expenditures based on financial data by account title and calculate emissions by using the GHG emission factor that is considered most applicable to the relevant account title. However, the granularity of most of these account titles is much coarser than that of the IDEA emissions factors, and there may be many candidates of GHG emission factors that could be applied to an account title. This is an uncertainty factor that may be affecting the calculation of GHG emissions. Another issue with the current system is that only representative items are registered for each expenditure, making it virtually impossible to accurately identify all expenditure items from financial data. For this reason, we tried to identify measures that will lead to the refinement of calculation from the following two perspectives.
  1) Enabling more detailed data on purchases from some suppliers (EC websites, etc.) to be incorporated into the new financial accounting system, which is scheduled to be introduced in fiscal 2027.
  2) Using activity data other than financial data for calculation and replacing estimates based on financial data with those based on activity data.

  For the former, we identified data and the like to be incorporated with the help of system developers. As for the latter, we tried calculation in UTokyo CA 2024 using waste treatment data that were available for Category 5. For UTokyo CA 2025, we expanded the scope of waste disposal data to be collected. We also experimented with the use of inventory control data on pharmaceuticals, etc. for Category 1, detailed data on fixed assets and equipment for Category 2, and travel expense data for Category 6.
  The outcome was positive. Although we stopped short of making full use of these data per se, we successfully remedied some of the problems with conventional calculations. The results are described in the next section.
  What remained unchanged was that IDEA data and other secondary data are used to calculate GHG emissions. Accordingly, the inventory results reflected, as before, the application of proxy data on actual emissions from the UTokyo supply chain, that is, data gained by replacing actual emissions with provisional alternative values. Going forward, we will continue working to establish calculation methods that better reflect efforts to reduce emissions from the supply chain. This will be done by, for example, acquiring primary data, such as product carbon footprints provided by suppliers and GHG emissions data from companies across the supply chain, and by acquiring mass-based activity amounts.

- In Scope 3, we assume that Category 4 emissions are included in Category 1 and 2 emissions. This is because it is practically impossible for our calculation process to isolate the portion of emissions from transportation and distribution from total emissions associated with purchased or otherwise acquired products and assets. Downstream emissions under Categories 9 to 14 are excluded from our calculation for two reasons. First, we find it difficult to collect relevant data. Second, we believe that the type of our activities as a university has little impact on these categories. In relation to Category 15 (investments), we are investing in UTokyo IPC. However, we have yet to establish the means to assess emissions from such investments.

Inventory Results and Analysis

Figure 5 shows UTokyo's Scope 1, 2, and 3 inventory results of GHG emissions for the stated reporting period. The graph shown in Figure 5 is created based on the following conditions in light of continuity and revision of calculation methods. The effects of data gap improvement shown in the preceding section are described in the inventory result analysis below.

- The graph shows the data for fiscal 2013 (the baseline year) and fiscal 2022, 2023, and 2024 (last three years).
- Non-energy-related Scope 1 emissions are shown separately from energy-related Scope 1 emissions (with the exception of fiscal 2013 due to data availability).[18]
- For Scope 2, data using TEPCO's unadjusted emissions factors are shown as before.
- As for Scope 3, data obtained with the revised calculation method are used. (The revised method can be retroactively applied to fiscal 2013, with some exceptions.)

Inventory Results for Scopes 1 and 2 (Based on TEPCO's Unadjusted Emissions Factor)

Energy-related Scope 1 and 2 emissions in fiscal 2024 (the latest data) were approx. 165,000 $MTCO_2e$, down 2.0% from fiscal 2023 and down 16.3% from fiscal 2013. In the energy-related Scope 1 in fiscal 2024, emissions from town gas grew 2.0% from fiscal 2023, mainly due to increased heat demand at the University Hospital. Scope 2 emissions also increased 2.0% due to an increase in the emission factor (up 2.1%) although electricity consumption remained almost unchanged (down 0.1%).

Non-energy-related Scope 1 emissions in fiscal 2024 (mainly from conditioner refrigerant leakage) amounted to approx. 1,900 $MTCO_2e$, accounting for approximately 1.1% of the total Scope 1 and 2 emissions, which stood at approx. 167,000 $MTCO_2e$.

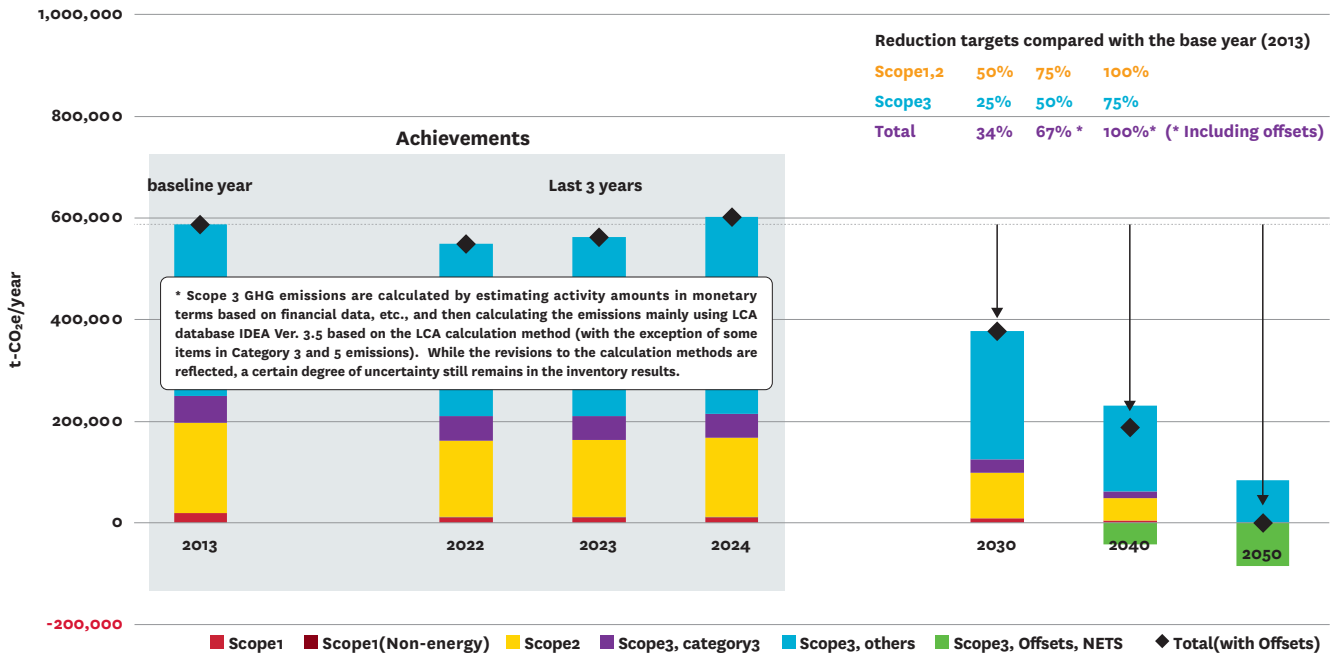

Figure 5 UTokyo Scope 1, 2 and 3 GHG inventory results with future targets

18 Although non-energy-related Scope 1 emissions for the baseline year (fiscal 2013) are not calculated, we can assume that the proportion of the Scope 1 emissions in total Scope 1 and 2 emissions is approximately 1% this year based on the inventory results in 2019 and later. Also, excluding the Scope 1 emissions results in a more stringent standard for setting reduction targets. Accordingly, we will keep using the interim reduction targets for 2030 and 2040, which are based on energy-related Scope 1 and 2 emissions in fiscal 2013.

Market-Based and Location-Based Scope 2 Calculations

As described in the preceding section, quantifying Scope 2 emissions involved calculations using market -based and location-based emission factors, as well as the current calculation method, which is based on TEPCO's unadjusted emissions factors. We conducted a similar evaluation for fiscal 2013 along with for fiscal 2024, the most recent year. Market-based calculations can lead to a significantly different assessment of emissions. This is most notable for Kashiwa II Campus, where the "effectively renewable energy" electricity plan (a plan using "Non-Fossil Certificates with Renewable Energy Attributes") is introduced in December 2022.

Figure 6 shows inventory results for fiscal 2013 (baseline year), fiscal 2023, and fiscal 2024 for different calculation standards. In local-based calculation for fiscal 2024, for which the emission factor is not available, the figure was calculated using the emission factor for fiscal 2023 and shown as a reference figure. The figure for the baseline year (fiscal 2013) is calculated using the alternative emission factor.[19] This is because the national average emission factor that is published by the central government and generally used as a location-based emission factor is available only for fiscal 2016 and later. Market-based calculations are made using the emission factor for fiscal 2023 because preliminary figures for fiscal 2024 are not available for some electric power companies (accounting for 2.6% of the total electricity consumption of UTokyo).

When calculated with the market-based method, the estimates for fiscal 2023 and 2024 are significantly small compared with when calculated with the current calculation method. Likewise, the rate of reduction from the baseline year (2013) is quite large. The reason is twofold. First, the emissions factor of TEPCO, the primary power supplier for UTokyo, is smaller than the unadjusted emissions factor even if it is a residual (a coefficient that is applied if the values of emissions factors specific to different rate plans such as green power are not publicly available).[20] Second, emissions from Kashiwa II Campus, which accounts for approximately 6% of UTokyo's total electricity consumption, are counted as zero because it adopted a green power rate plan in the second half of fiscal 2022. However, the rate of increase in fiscal 2024 from the fiscal 2023 level is larger for the market-based method than for the current calculation method. This is due to the rate of increase in TEPCO's residual emission factor.

When location-based method is used, the estimate for fiscal 2023 will result in somewhere between the figure obtained with the current calculation method and the figure obtained with the market-based method. Comparison between fiscal 2023—for which actual figures are available—and the baseline year of fiscal 2013 shows that the rate of reduction is characteristically higher for the location-based estimate than the estimate based on the

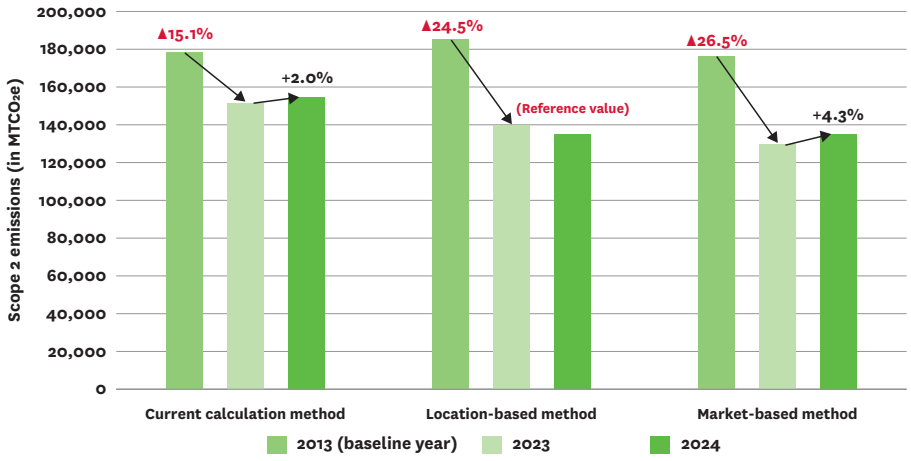

Figure 6 Scope 2 Emissions by Calculation Method

19 A coefficient used for electricity purchased from suppliers whose emissions or other data cannot be obtained. The central government publishes this value as the average of the emission factors for external-use and private-use power for the most recent five years that are published in its Comprehensive Energy Statistics. https://www.meti.go.jp/shingikai/energy_environment/ontaiho_haisyutsu/pdf/016_02_00.pdf (in Japanese)

20 Fiscal 2024 preliminary figures show an unadjusted emission factor of 0.485, an adjusted emission factor of 0.408, and a residual of 0.452.

current calculation method. The coefficient used in location-based calculations is thought to be a representative value for Japan as a whole. It is thus reasonable to conclude that the decarbonization of power sources in Japan as a whole is slightly more advanced than that of TEPCO alone.

Revisions to the Calculation Methods for Scope 3

As stated in the preceding section, Scope 3 calculations are made mainly on the basis of expenditures shown in financial data. Financial data are useful for comprehensively measuring all the activities of UTokyo. However, some items are difficult to identify or classify depending on the account title. This is the main cause of uncertainty in calculations. To accurately assess efforts to reduce Scope 3 emissions, it is necessary to describe activity data in terms of physical quantities and to apply primary data to calculate GHG emissions. This requires finding ways to identify activity data. In this fiscal year, we explored ways to use activity data other than financial data for several items. When reflecting activity data other than financial data in calculations, we compared activity data with corresponding financial data to avoid double counting.

①Category 1 (purchased goods and services)

Category 1 is the largest source of GHG emissions in Scope 3. The Category 1 emissions in fiscal 2023 estimated with the existing calculation method for UTokyo CA 2024 accounted for approximately 61% of total Scope 3 emissions. With Scope 3 amounting to approximately 74% of total GHG emissions in the same year, this category alone makes up nearly half of the total emissions of UTokyo. A breakdown shows that pharmaceuticals and medical supplies used at the University Hospitals and elsewhere take up large shares, accounting for 35% and 17%, respectively. Among the items not related to medical care, supplies constitute 23%.

As a majority of pharmaceuticals for medical care are purchased in bulk monthly, financial data contain little information on the items. Accordingly, we reviewed pharmaceutical data managed at the hospitals. We then found out that an analysis of these data allows us to identify the amount of each pharmaceutical item purchased. Because the product carbon footprint for each item is not provided at the moment, direct calculations based on primary data are difficult. Yet, we tried to identify pharmaceutical items and reviewed the applicable IDEA product codes. We also obtained similar management data on medical supplies, which came in a diverse range of items. We plan to analyze them going forward.

Supplies, which also account for a large share, include a wide variety of items, ranging from stationery items priced at several dozen yen to special reagents priced at several dozen million yen. It is therefore difficult to identify these items at the moment. When the new financial accounting system is put into operation in 2027, more detailed data will become available for purchases from some certain suppliers. At any rate, we plan to continue exploring ways to identify expensive supplies among other items.

②Category 2 (capital goods)

Category 2 is another major source of emissions, accounting for 23% of Scope 3 emissions in fiscal 2023 as reported in UTokyo CA 2024. Making up half of total Category 2 emissions are instruments and equipment. For this category, we referred to the data that cover the schedules of fixed assets (assets with an acquisition price of 0.5 million yen or more, in principle), a list of small-sum equipment (assets with an acquisition price of 0.1 million yen or more, in principle), and a list of borrowed goods. These data, which cover assets registered on an item-by-item basis, allow a more accurate assessment of the number of asset items, their descriptions, and other details than financial data, in which the acquired assets do not necessarily correspond one on one with their invoices. In addition, fixed asset schedules, which contain classifications for managing the useful lives of such assets, can provide a means to increase the granularity of the item classification of instruments and equipment, which come in a variety of items. Moreover, financial data can address the following issues:

- Some account titles (those related to KAKENHI, Grants-in-Aid for Scientific Research) are currently classified as Category 1, but in practice, they cover the purchases of not only supplies but also fixed assets and small-sum equipment. The use of fixed asset schedules and the like make it possible to accurately classify these items into Category 1 and Category 2.
- Fixed assets and small-sum equipment acquired through in-kind donations have not been included in calculation because they are not reflected in financial data as expenditures. The use of fixed asset schedules and the like allow us to include these items in calculation.

We are planning to further explore ways to increase the granularity of item identification and to make better use of primary data by directly using fixed asset schedules and the like. For the calculation for this fiscal year, all we did in this context was, as mentioned above, to classify account titles related to scientific research expenses into Category 1 and Category 2 and to account for assets in acquired through in-kind donations. It is worth noting that when UTokyo makes a proxy purchase of a borrowed good it does not own, that article is, as a rule, accounted for as an equipment expenditure and thus included in the inventory estimation. UTokyo has goods borrowed in-kind as well, though in small quantities. Our latest accounting covers

such borrowed in-kind goods as well as assets acquired through donations in kind.

③Category 5 (waste)

In UTokyo 2024, calculation for Category 5 was switched to mass-based method for general, industrial, and laboratory waste in Hongo. For this report, data on these types of waste for fiscal 2024 were added, and the scope of mass-based calculation was expanded to include mercury waste; special waste; infectious waste from the Faculty of Agriculture and the Faculty of Engineering; and general, industrial, and infectious waste from the University Hospital that are distinguished from those from the Hongo Campus. Expenses for treatment of waste from the University Hospital (particularly infectious waste) have a certain level of impact as they are particularly larger than treatment expenses for the entire Hongo campus excluding the hospital.

Regarding general and industrial waste from the Hongo Campus, we have obtained data for not only fiscal 2024 but also the baseline year (fiscal 2013). Other newly obtained data are for fiscal 2024 only (from fiscal 2023 to fiscal 2024 for some data). We will continue to explore the possibility of acquiring data on waste from other locations than the Hongo Campus.

④Category 6 (business travel)

Category 6 is yet another major source of emissions, accounted for 25% of Scope 3 emissions in fiscal 2023 as reported in UTokyo CA 2024. From fiscal 2021 to fiscal 2022, Category 6 emissions declined significantly due to the impact of COVID-19 pandemic. Since fiscal 2023, however, they have almost returned to the pre-pandemic levels. For this category, it is difficult to analyze the breakdown of expenses based on financial data. Therefore, all business travel expenses had been calculated as air travel fares using the spend-based method. This approach is designed to avoid underestimation according to the principle of applying LCA. Evaluating reduction efforts, however, requires accurate assessment of air travel made, which are generally considered to be a major emissions source. Therefore, we experimented with the use of the data of UTokyo's travel expense reimbursement system this fiscal year.

The use of these data allows us to take into consideration the information on business travel destinations (especially representative ones) and the breakdown of business travel expenses, such as transportation expenses by means of transportation, lodging expenses, and daily travel allowances. However, this system does not cover the travel expenses directly arranged by travel agencies other than contractors designated under the system, the travel expenses paid for with a corporate card, or the expenses of short-distance transportation. All these travel expenses, which account for about 20 to 30% of total travel expenses actually incurred, were calculated with the conventional method, i.e., based on the assumption of air travel.

It is necessary to visualize efforts to reduce emissions in this category as well. This can be made by assessing, most notably, air travel, which is thought to make up a majority of Category 6 GHG emissions, in physical terms such as the distance flown. The problem is that the current travel expense data cover representative business travel destinations only, making it difficult to accurately assess the distances actually flown. This underscores the need to explore ways to acquire such data going forward.

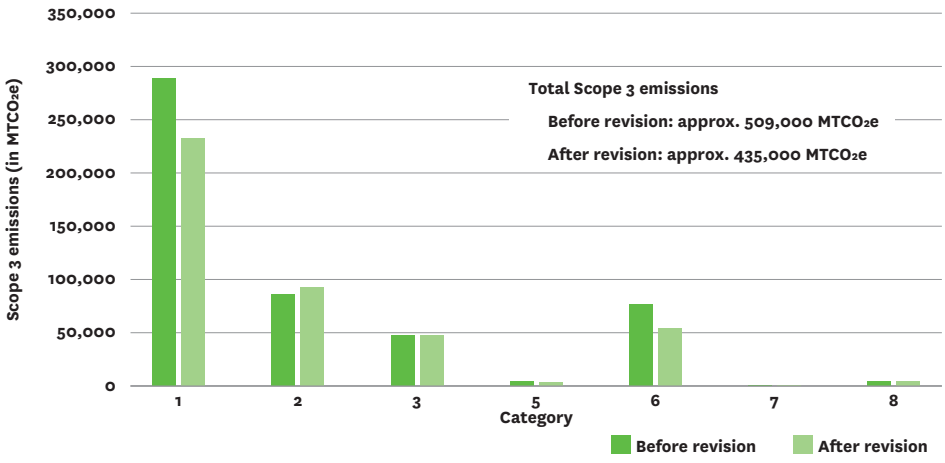

Figure 7 Effects of the Scope 3 Calculation Method (Fiscal 2024)

Inventory Results for Scope 3

①Impact of revisions to the calculation methods

As mentioned in the preceding section, we revised the calculation methods for areas with significant impacts, starting from this fiscal year. The ultimate purpose of such revisions is to more accurately assess reduction efforts across the supply chain. However, many issues still remain to be solved in order to achieve this purpose. Current revisions are designed to correct as much as possible the distortions in the overall inventory of emissions due to uncertainties in calculation.

Figure 7 compares two GHG emissions inventories for fiscal 2024 for each of selected categories that are estimated using two different calculation methods: the conventional method (the spend-based method is applied to expenditures by account title based on financial accounting data) and the newly revised method. The revised method resulted in a decrease of approx. 74,000 $MTCO_2e$, or 15%, in total Scope 3 emissions estimate. The decrease accounts for 12% of total Scope 1, 2 and 3 emissions calculated after the revision, with the proportion of Scope 3 emissions in total emissions decreasing from 75% to 72%.

Estimated emissions in Category 1 (purchased goods and services) have the greatest decline. This is due in most part to the revised emission factor for pharmaceuticals, which pushed down the emissions estimate by approx.46,000 $MTCO_2e$. As it stands, calculations are made based on secondary data. Given that the University Hospital purchases many special items of pharmaceuticals, there is room for switching to calculations based on primary data, including item-specific carbon footprints and pharmaceutical manufacturers' GHG emissions data. Such a switch in calculation method could mean significant changes to estimated emissions.

Estimated emissions in Category 2 (capital goods) are influenced by a number of changes to the calculation method. Examples include the switch of some monetary figures in some account titles from Category 1 to Category 2 and the addition of capital goods acquired by in-kind donation. The result is a decrease of approximately 10,000 $MTCO_2e$ for Category 1 and an increase of 6,000 $MTCO_2e$ for Category 2. The most likely reason why the reduction in Category 1 is greater than the increase in Category 2 in absolute value is the changes in the applicable IDEA emission factors due to the changed categorization. Detailed item analysis has not yet been completed for capital goods, most notably instruments and equipment. As such, we plan to make further revisions.

Estimated emissions in Category 5 (waste) are decreased by800 $MTCO_2e$ after the revisions, although the impact is small, accounting for only 0.8% of total Scope 3 emissions. Starting in the previous fiscal year, we make mass-based calculations of general and industrial waste from Hongo and university-wide laboratory waste. The switch to mass-based calculation resulted in an increase in estimated emissions in the previous fiscal year, representing a reverse trend in relation to fiscal 2024 estimates. The most likely reason for this is the effect of the mass-based calculations of infectious waste from the University Hospital for fiscal 2024. As far as this waste is concerned, the switch to mass-based calculation resulted in a decrease of approx. 2,000 $MTCO_2e$. The need to handle infectious waste means a high unit fee for waste treatment. Accordingly, the spend-based method tends to overestimate the emissions for such waste.

Emissions in Category 6 (business travel) in fiscal 2024 are estimated at approx. 54,000 $MTCO_2e$. This figure, which is calculated by applying most applicable IDEA emission factors to expenses for different non-air transportation means identified

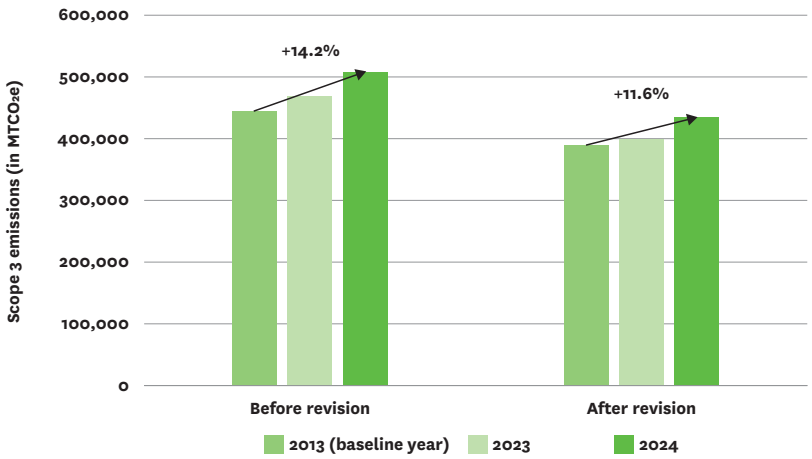

Figure 8 Effects of Scope 3 Calculation Methods (Changes from the Baseline Year)

from the travel expense data, is approximately 23,000 $MTCO_2e$ (or approximately 30%) lower than the value calculated by applying the air travel emission factor to all kinds of business travel expenses. Air travel is found to account for approximately 73% of total emissions that are estimated using the travel expense data. This is another reminder that air travel dominates this category.

②Comparison between Fiscal 2024 Estimates with Those for the Baseline Year and Previous Year

Figure 8 shows changes in Scope 3 emissions estimates from 2013. The Scope 3 estimate (including those in Category 3) for fiscal 2024 increased 14.2% and 11.6% from the baseline year (fiscal 2013) according to the pre-revision and post-revision calculation methods, respectively. Likewise, the estimate increased 8.6% and 8.9% from the previous year (fiscal 2023), respectively. Significant increases in post-revision estimates from the previous year are observed in Category 1 (up 5,7%), Category 2 (up 27.8%), and Category 6 (up 8,7%). The revised calculation method is retroactively applied to the baseline year (fiscal 2013) with regard to matters related to Categories 1, 2, and 6 as well as general and industrial waste from Hongo (Category 5). For other emissions from waste, such retroactive application to fiscal 2013 is difficult due to data unavailability. It should be noted, however, the effect of this difficulty on emissions estimates must be minimum since Category 5 emissions account for about 0.8% of total Scope 3 emissions.

The largest cause for the lower rate of increase from the baseline year associated with revised calculations is considered to be the revised emissions factor for pharmaceuticals. The purchased amount of pharmaceuticals at the University Hospital and elsewhere has been increasing year by year not least because of the wider use of advanced medicine. Accordingly, the effect of the revised emission factor for pharmaceuticals is smaller for the 2013 estimate, which is about 30,000 $MTCO_2e$ lower, than for the 2024 estimate, which is some 46,000 $MTCO_2e$ lower.

The fact remains, however, that revised estimates are based a secondary database that uses IDEA and other emission factors; they fail to reflect the effects of rising prices (CPI grew some 15% in fiscal 2024 from fiscal 2013), suppliers' efforts to reduce emissions, and other factors. It is noteworthy that travel expenses in Category 6 remain on the rise from fiscal 2023.

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Verification

UTokyo plans to conduct verification of the type of data used, calculation methods, and visualization and interpretation of the calculation results, through consultation with UTokyo's experts in areas such as LCA, energy demands of buildings, energy systems, and climate and society. The objective of this verification is not only to increase the coverage, accuracy, and consistency of the assessment, but to ensure that necessary insights and tracking information can be obtained to assist each climate action and UTokyo CA targets. UTokyo CA WG mentioned above also assumes a similar role in verification.

The GHG emissions profile of UTokyo is not currently verified by an external party or a third party. Yet the university reported on its initiatives (mainly around Scope 3 calculations) at EcoBalance 2024, a biennial international conference held in Sendai in November 2024. This can be deemed to be part of our verification activities to obtain valuable insights and information from external sources by disclosing UTokyo's activities to experts from within and outside of Japan. Going forward, we continue to report on our progress at academic conferences and on other occasions.

3

Initiatives to Reduce GHG Emissions as a Business Entity

UTokyo's campus, with its faculty, staff, and students totaling approximately 40,000 members, forms a whole town-like community encompassing not only classrooms, offices, laboratories and other educational facilities but also life-related facilities including shops, cafeterias, and even a hospital. The main objective of UTokyo's efforts to reduce GHG emissions as a business entity is to contribute to carbon neutrality of cities and society as a whole, by returning the fruits of its efforts obtained on campus, a living laboratory, to society.

3
1

Principles and Policy for Emission Reduction Measures

UTokyo Climate Action must be developed in a manner so as not to compromise the effectiveness of the university's research and education activities as a research-driven comprehensive university. Therefore, we will not deter such activities by limiting the use of facilities and equipment; at the same time, we will spare no effort to eliminate waste. The comfort and usefulness of the environment will not be compromised, but improved.
As a general rule, approaches to reduce GHG emissions will be considered in the priority order of Avoid, Reduce, Substitute, Switch to on-site[21] renewable sources, Switch to off-site[21] renewable sources, Sequester, and Offset.

A mechanism will be developed to consult the faculty, staff, and students of UTokyo no matter what measure is considered and implemented, to collect input from university members and enable their active participation in the decision process. Adoption of climate actions will be finalized through the use of existing discussion bodies and other means.

The Center for Strategic Promotion of GX, which was established in fiscal 2025, has taken over the policies and strategies that were developed by the Campaign GX Task Force of the GX Promotion Subcommittee in fiscal 2024. It has also formulated comprehensive policies and strategies for achieving CO_2 emissions reduction targets shown in Table 5. The Center makes these policies and strategies known at major on-campus meetings, most notably the Deans and Heads of Institutes Council.

Table 5 Comprehensive Policies and Strategies for Achieving CO_2 Emissions Reduction Targets

Policy		Strategy
Development of structures for reducing Scope 1, 2, and 3 emissions		1. Establishing the Center for Strategic Promotion of GX in April 2025, a new organization to consolidate resources scattered across the university, clarify their responsibilities and authorities, and allow timely decision-making 2. Formulating action guidelines to be followed by all UTokyo members to systematize rules and norms
Initiatives to address Scopes 1 and 2	Reduction of energy demand	3. Introducing a data-driven, AI-based building carbon management (BCM) system to optimize energy consumption and encourage behavior change in users 4. Setting multifaceted targets for new buildings and retrofitting work, including those related to ZEB levels, through BCM, and implementing secure and rational designs and work execution to achieve these targets 5. Establishing guidelines for improving the operation of research and laboratory equipment to reduce unnecessary energy consumption 6. Sharing and commending good practices through an Environmental GX Award (tentative name) to raise awareness and operational efficiency on the part of UTokyo members with a view to inducing their behavior change
	Measures on the energy supply side	7. Installing off-site energy creation equipment 8. Demonstrating and implementing research findings related to renewable power generation on campus 9. Procuring renewable energy
Initiatives to address Scopes 3		10. Improving the methods for collecting activity data by updating the financial accounting system (during fiscal 2026) to quantify CO_2 emissions 11. Encouraging behavior change in each UTokyo member with the use of visualized data

21 On-site: Renewable energy generation facilities are located on the premises of the energy consumer.
Off-site: Renewable energy generation facilities are located off the premises of the energy consumer.

Initiatives Related to Scopes 1 and 2

GHG Emission Performance and Progress against Target

Through TSCP, launched in 2008, UTokyo has been promoting energy-saving measures (physical measures), most notably by enhancing the efficiency of equipment, and encouraging energy-saving behavior (non-physical measures). The goal is to achieve a low-carbon campus, with top priority given to reducing Scope 1 and 2 GHG emissions. As a result, energy-related Scope 1 and 2 emissions as of fiscal 2024 were estimated at approx. 165,000 $MTCO_2e$, a reduction of approx. 32,200 $MTCO_2e$ (or 16.3%) from the baseline year (fiscal 2013). Of this margin of reduction, approx. 14,700 $MTCO_2e$ (7.4%) are attributable to lower electricity emission factors, and approx. 17,600 $MTCO_2e$ (8.9%) are to TSCP and other initiatives in the absolute value of emissions. Please note, however, that the total building area is 4.7% larger than the 2013 level. Assuming that energy consumption per area remains constant, BAU emissions[22] with fiscal 2013 being the baseline year are estimated at approx. 191,000 $MTCO_2e$, even if the lower electricity emission factor is taken into account. Therefore, the reduction due to TSCP and other initiatives in terms of BAU emissions can be estimated to be equivalent to approx. 25,200 $MTCO_2e$. In fiscal 2024, the on-site solar power generation system of Phase I was put into full operation. The Phase II system began operation in the second half of the same fiscal year. In fiscal 2024, this power generation system contributed to a reduction of approx. 900 $MTCO_2e$ (or approximately 0.5%) in Scope 2 emissions.

In addition, if we assume that the procurement of renewable energy (green power) at Kashiwa II Campus based on a non-fossil certificate or the like had an effect of reducing emissions, the additional amount of reduction will be approx. 10,000 $MTCO_2e$ (5.0%), thus increasing the rate of reduction from the baseline year to 21.3%.

As noted in UTokyo CA 2024 last year, however, the current reduction rate is insufficient. To achieve the 2030 target, we still need to reduce emissions by approx. 67,000 $MTCO_2e$ or approx. 57,000 $MTCO_2e$ if green power at Kashiwa II Campus is taken into account (Figure 9 below).

At the same time, our campuses located in Tokyo (Hongo, Komaba I, Komaba II, and Shirokane campuses) are subject to the cap-and-trade (C&T) program under the Tokyo Metropolitan Environment Security Ordinance. Therefore, these campuses need to meet the mandatory GHG reduction targets set by the Tokyo

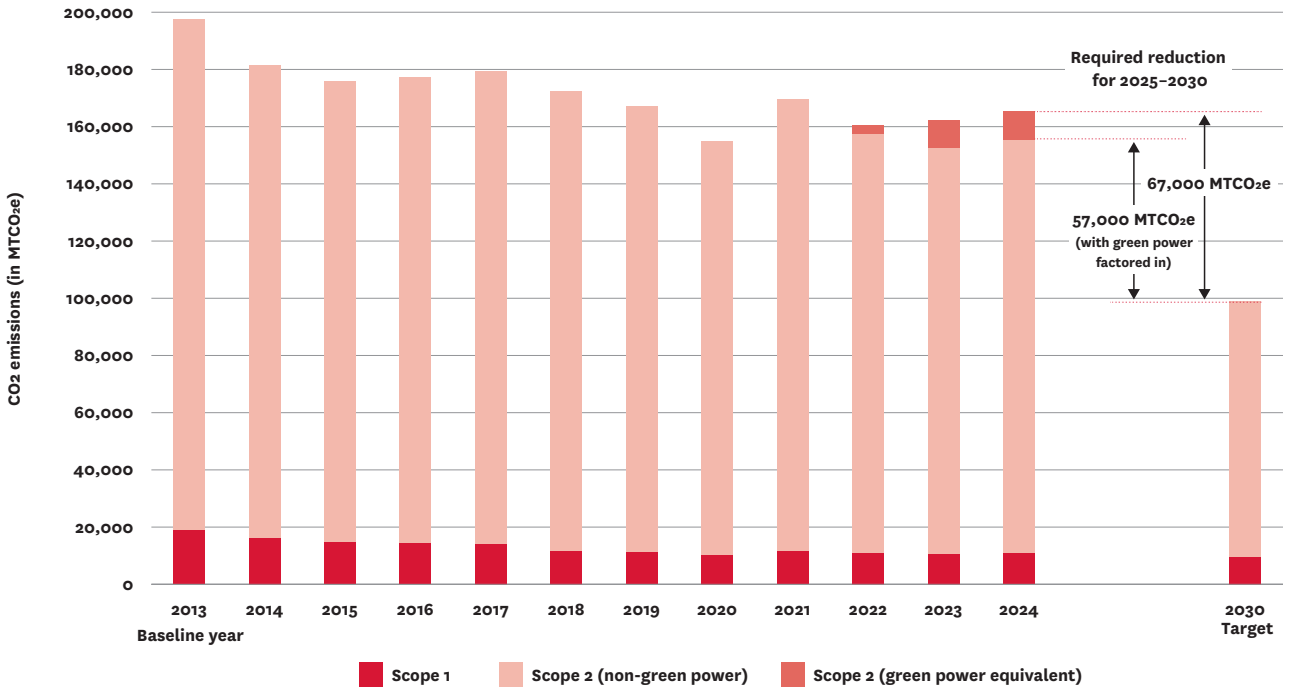

Figure 9 Changes in Scope 1 and 2 Emissions and Required Reductions (Energy-Related)

22 The term "BAU (business as usual) emissions" refers to emissions assumed if no additional measures are taken from the baseline year.

Metropolitan Government (TMG). The mandatory GHG reduction targets set for the fourth compliance period from 2025 to 2029 are much higher than those for the first to third compliance periods.

Scope 1 and 2 Emission Reduction toward Achieving Target

As shown in Table 5 in the preceding section, our action to reduce Scope 1 and 2 GHG emissions is two-fold: measures to reduce energy demand and measures on the energy supply side.

①Measures on the demand side

Under TSCP, we have been retrofitting our buildings with energy-efficient air conditioners and light fixtures. We have already replaced 93% of the existing light fixtures with LED ones as of the end of fiscal 2024. Going forward, we will not only continue with our ongoing initiatives but also work to consolidate and share laboratory equipment as proposed by departments and divisions in order to enhance our reduction efforts.

Furthermore, as a new measure on the demand side, we began to work on the introduction of building carbon management (BCM) in fiscal 2025. The BCM project takes advantage of college bonds (Sustainability Bonds, popularly known as "UTokyo Compass Bonds")[23] to make some of our existing buildings—the top 30 carbon-emitting buildings in Hongo, which account for some 70% of total emissions there—fundamentally energy efficient through energy use optimization.

Specifically, the project involves installing a sensor in each room and equipment (particularly air-conditioning equipment), digitizing operational statuses of these sensors to make them visible, storing the digitalized data in a cloud environment, and analyzing the data. The aim is to prompt wider action to eliminate any waste in energy consumption. We will use AI for operation of the BCM system to accelerate the optimization process (Figure 10). This project aims to save energy and cut CO_2 emissions by 30%. It also aims to enhance the value of campus space and to develop an app designed to improve literacy that induces behavior change in the future.

②Measures on the energy supply side

On the other hand, use of energy cannot be avoided in research and education activities of a university, and therefore measures on the supply side, in other words, introduction of renewable energy also needs to be promoted to achieve carbon neutrality. As mentioned earlier, we generated electricity that was equivalent to a reduction of approx. 900 $MTCO_2e$ per year with our on-site solar power facilities in fiscal 2024. Ultimately, these facilities are expected to generate electricity equivalent to approximately 1% of total annual power consumption or approx. 1,500 metric ton carbon dioxide equivalent ($MTCO_2e$). We are also considering introducing off-site solar power generation on the lands UTokyo owns outside its main campuses. It has become clear, however, that the solar power option alone will not significantly reduce emissions. For one thing, it is difficult to install more solar power facilities on the campuses due to limited space. For another, we have found that off-site spaces available for solar panels are also limited. An alternative option is to start using "effectively renewable energy" with a Non-Fossil Certificate, as was the case in Kashiwa II Campus. In fact, we are considering the use in our main campuses, i.e., Hongo, Komaba I, Komaba II, Shirokanedai, and Kashiwa campuses, as electric power contracts for these locations will be renewed in 2026 or later.

Figure 10 The PDCA Cycle and Expected Outcomes of the BCM Project

23 UTokyo Decides Terms for Third Issuance of UTokyo Compass Bonds
https://www.u-tokyo.ac.jp/focus/ja/articles/z1502_00016.html (in Japanese)

To start using effectively renewable energy, we factor in the following two considerations:

- The certificate-based use of effectively renewable energy should not be regarded as the ultimate means to achieve carbon neutrality; it should be regarded as a means of filling the time lag in the implementation of other measures. In other words, it should be adopted as a provisional measure until the implementation of large-scale measures such as BCM and off-site solar power generation, which take time to produce results because they involve the time-consuming tasks of facility designs and construction work. A minimum quantity of effectively renewable energy should be used as a temporary means to achieve interim reduction targets or as a means to meet mandatory reduction requirements such as those under TMG's C&T program.
- The quality of the certificate to be adopted must be carefully examined. Specifically, we should adopt a certificate of renewable energy with additionality to contribute to global carbon neutrality. Because additionality remains subject to ongoing international debate, we should establish a procedure for selecting a certificate that is considered appropriate at the time of such selection in light of such international debate.

③Emission reduction roadmap up to 2030

Figure 11 shows the prospects for reduction by 2030. On the demand side, we aim to sustain the effect of reduction of about 1,000 $MTCO_2e$ per year that has been made possible chiefly by energy efficiency retrofitting under TSCP. The problem, however, is that we have already replaced more than 90% of the existing light fixtures with LED units. This underscores the need to ramp up reduction activities, including finding new energy-saving items and thoroughly pursuing behavior change toward energy conservation.

Another demand side measure is the BCM project, which covers 30 existing buildings in Hongo. Given that the project conducts designing and related work building by building, its effects will not manifest themselves until 2027 onward. We assume that the project will eventually produce constant reduction effects from 2035 onward. Still, as their final reduction effects are significant, we need to steadily proceed with the project.

On the energy-supply side, we began full operation of on-site solar power generation facilities for Phase I installation in 2024. Those for Phase II installation have been phased in starting in the second half of fiscal 2024. Due to the limited site availability, the installation process will be suspended after facilities for Phase II installation begin full operations during fiscal 2025. Off-site solar power generation will be installed from 2027. We aim to put it in operation in fiscal 2028, but its capacity will be limited, again due to limited area of sites owned by UTokyo.

Therefore, we believe that we have no choice but to opt for proactive procurement of renewable-derived electricity until BCM and demand-side measures produce full effects and sufficient progress is made in power source decarbonization in Japan. Procurement requirements have been already described in the preceding section. As for procurement quantities, we will deploy appropriate amounts in light of not only the targets in UTokyo Climate Action but also the reduction obligations under TMG's C&T program.

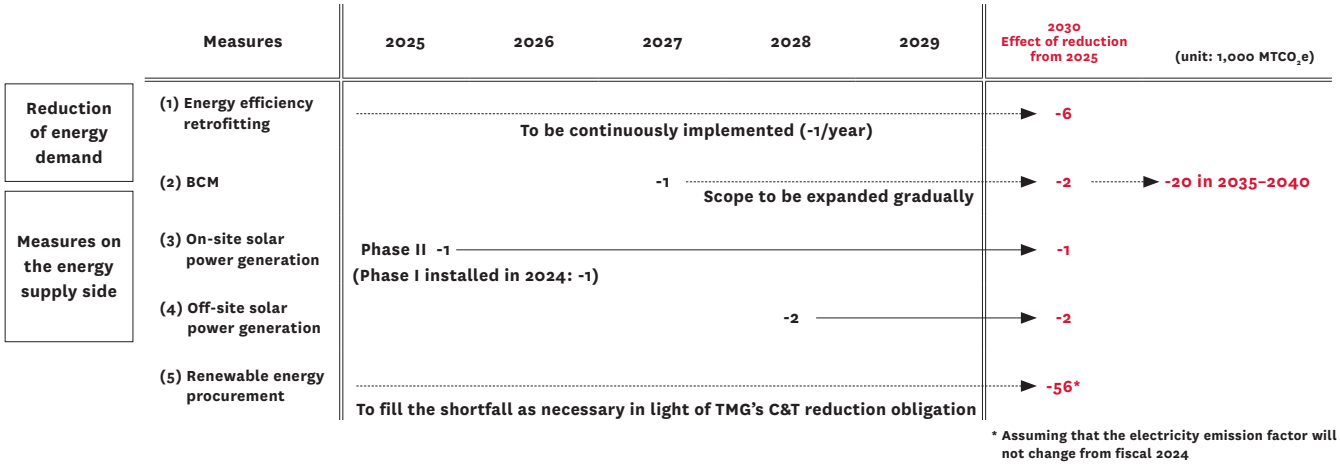

Figure 11 Reduction Roadmap by Measure (Energy-related Scope 1 and 2 emissions)

Initiatives Related to Scope 3

Challenges that Hinder Calculation and Reduction of Scope 3 Emissions

Scope 3 emissions account for approximately 70% of the total emissions of UTokyo (for fiscal 2024, estimated with the revised calculation method). Recent data shows that consumer demand, especially that in the developed world, accounts for much of GHG emissions overseas.[24] Cutting Scope 3 emissions constitutes a crucial climate action, not least in the context of reducing the overall global environmental burden. In order to achieve this, activity amounts related to indirect emissions of CO_2 and emissions of each activity must be accurately measured (and visualized). Then, a cycle of development and implementation of reduction actions followed by assessment of the reduction outcomes must be created and implemented.

Nevertheless, comprehensive universities like UTokyo conduct extremely diverse activities that involve indirect CO_2 emissions, ranging from purchasing, asset procurement, waste treatment, and business travel. The expenditure data in our financial system that we use as indices for measuring these activities (data extracted from the processed invoices that concern CO_2 emissions estimates) contain nearly one million cases per year. We must establish methods to appropriately group such an enormous number of activities and to assess emissions, and develop and implement action plans to reduce emissions. Then we have to come up with methodologies to evaluate the outcomes. These activities are nothing but the “Climate Action” of UTokyo.

These issues related to Scope 3 have been addressed by the UTokyo CA WG, which consists of LCA-related faculty members, since fiscal 2023. Even after the Center for Strategic Promotion of GX was launched in April 2025, we continue to undertake such an activity.

Initiatives to Measure Activities Related to Scope 3 and Calculate Their Emissions

①Improving the method of measuring activities

For UTokyo CA (first edition) released in 2022, we obtained most of the activity data related to Scope 3 (excluding energy-related data in Category 3) from financial data. While financial data have the advantage of being able to inventory all activities of UTokyo, they have the following shortcomings:

- Items are not necessarily linked one on one with their invoices. Multiple items might be processed with one invoice, or conversely, one item might be purchased with multiple funds.
- A wide variety of goods and services can be classified into a single account title. For example, supplies expenses cover the purchase of all kinds of goods except fixed assets and equipment, ranging from light refreshments served at meetings and stationery to special reagents and physicochemical equipment parts.
- Account titles do not necessarily correspond one on one with categories in Scope 3. For example, waste treatment, which is classified into Category 5, may be accounted for as maintenance expenses, an account title in Category 1.
- Because only direct suppliers are recorded, information on manufacturers, which are usually the largest emitter in the value chain, may not be available.

A viable approach to addressing these problems may be to remedy these problems when updating the financial accounting system, which will be put in operation in 2027. This system is now in the process of system development. In the process, we are looking into the possibility of linking records of purchases on EC websites (including on-site purchases at the University of Tokyo Co-op) with the financial accounting system as the first step. This will make it possible to classify purchased items and identify their manufacturers, raising the possibility of obtaining more accurate data not least on supplies, which account for a large proportion in Category 1. And yet, only a small percentage of purchases are made on EC websites at UTokyo. To enhance calculation accuracy, we need to increase the number of suppliers willing to work with us in this regard.

Another approach is to utilize activity data other than financial data. In UTokyo CA 2024 published last year, we tried replacing part of waste data with mass data in estimating emissions from waste. As has already been described in Section 2.5, we have expanded the scope of waste data for this fiscal year. We also looked into using management data on pharmaceuticals at the University Hospital, schedules of fixed assets and small-sum equipment, and travel expense data. The use of these data has the following benefits:

- These are essentially activity unit data. (For example, in the case of goods, there is one set of data per item, and in the case of official trips, there is one set of data per official trip.)
- Depending on the data source, the data may provide information that could not be obtained from financial data, such as information on manufacturers (in the case of pharmaceuticals) and categories of items (fixed asset

24 Center for Global Commons, University of Tokyo, “Global Commons Stewardship (GCS) Index 2022” (the third edition) https://cgc.ifi.u-tokyo.ac.jp/en/topics/gcsi2022-2/

schedules).

However, these non-financial data have the following shortcomings:

- These data provide clues as to how to classify items as in the case of fixed asset classification. However, such a classification is not necessarily aligned with the classification for estimating CO_2 emissions because non-financial data have different objectives. (Fixed asset classification, for example, is designed to help calculate the depreciation useful life.)
- Some data are managed by departments and divisions rather than the university as a whole. It is not yet fully understood what kind of data are available on campus.
- Consistency checking with financial accounting data, which is necessary to avoid duplicate calculations, is cumbersome.
- Some types of data, including travel expense data, defy mass-based calculation and fail to cover all related expenditures as a whole.

The remaining challenges for this approach include how to use non-financial data for more detailed calculations and how to acquire additional activity data. In relation to the first challenge, we experimented with the use of pharmaceutical data and fixed asset schedules among other types of data in the process of revising the calculation methods. However, we have not yet fully looked into improving the granularity of items and item classifications using data themselves. Not have we fully looked into replacing emission factors with primary data. In this regard, we have already begun to look into AI-assisted item classification and other issues in collaboration with students. The ultimate goal is to build a system designed to evaluate reduction efforts. As for the second challenge, we will search for underutilized data that exist on and off campus (including those at suppliers). Regarding a certain type of data, such as travel expense data, that defy mass-based calculations (e.g., calculation based on the distance traveled), we will set our eyes on acquiring different data separately.

②Toward calculation capable of evaluating reduction efforts (the use of primary data)

The current Scope 3 calculations apply emission factors of IDEA and other secondary databases to expenditures (spend-based method) except for Category 3 and part of waste. Because of their high comprehensiveness and resolution, these secondary databases have been playing a major part in identifying which of UTokyo's activities are major sources of CO_2 emissions.

Yet, this method has the following major problems:

- Problems related to the uncertainty of estimates. Emission factors of IDEA and other secondary databases, which represent industry averages calculated based on using input-output tables, may not be compatible with the special characteristics of research and other activities of a university. (Typical examples include pharmaceuticals used in advanced medicine, physicochemical machines and their parts specially made for cutting-edge research, reagents, and laboratory instruments.)
- Problems with the evaluation of reduction efforts. Secondary data, which do not identify individual products or services, are incapable of reflecting reduction efforts, especially those made by specific suppliers and those made by purchasers to opt for products with a low carbon footprint. In addition, calculations with the spend-based method can produce much higher estimates than real values in the face of rising prices. They can also create a situation in which the preference of eco-friendly products pushes up higher estimates because of their higher prices.

These issues have been subject to international debate. SBTi's Scope 3 Discussion Paper,[25] released in July 2024, recognizes that dependence on secondary data is one of the issues in setting and meeting Scope 3 reduction targets. For its part, the Ministry of the Environment released a guide to supply chain emissions accounting using primary data[26] in March 2025. This guide sets out two specific procedures. One uses product-based emissions data. The other uses organizational-based emissions data. More specifically, the former is a method to collect cradle-to-gate emissions data for products concerned from their suppliers and apply the collected data. The latter is a method to calculate the emissions of products concerned based on the ratio between the emissions of a supplier in Scope 1, 2 and 3 (Scope 3 emissions being upstream only) and the percentage of the monetary amount of purchases made by the reporting company (or organization) from the supplier to the total sales of that supplier.

A preferable option is to obtain and apply product-based emissions data. Such data are hard to come by, however, because activities at UTokyo involve an enormous number of suppliers, many of whom are sales agents. Yet, there have been

25 SBTi RESEARCH: SCOPE 3 DISCUSSION PAPER (July2024)
https://files.sciencebasedtargets.org/production/files/Aligning-corporate-value-chains-to-global-climate-goals-SBTi-Research-Scope-3-Discussion-Paper.pdf?dm=1734357669&_gl=1*15b7rq5*_gcl_au*MTczNTcoODQuMTc1NzQ3ODE5Mg..*_ga*MTI1MDUzNDEzOC4xNzU3NDc4MTkz*_ga_22VNHNTFT3*czE3NTcoNzgxOTIkbzEkZzAkdDE3NTcoNzgxOTIkajYwJGwwJGg2MjQzNjc3MTY.

26 Ministry of the Environment, "Guide to supply chain emissions accounting using primary data," March 2025
https://www.env.go.jp/earth/ondanka/supply_chain/gvc/files/tools/1ji_data_v1.0.pdf (in Japanese)

positive developments in recent years. An increasing number of manufacturers, most notably those of computers, voluntarily disclose carbon footprints (CFPs) of some of their products. The Act on Promoting Green Purchasing, which is applicable to the central governments and independent administrative corporations including UTokyo, calls for CFP disclosure from 2023 while designating factors for considerations and reference values for this purpose. The Act covers 228 items in 22 sectors. (For fiscal 2025, reference values are designated to four items, including copiers, and factors for considerations are designated to about 20 items, including stationery, office furniture, printers, and lighting equipment.)[27] Going forward, we will use such information to replace emission factors with primary data. For the purchase of large tailor-made equipment and facilities for cutting-edge research on campus, we will look into taking action to calculate CFPs by conducting LCA analysis ourselves.

Organization-based emissions data entail slightly less accurate estimates than product-based ones. But they are relatively readily available and better capable of reflecting suppliers' efforts to reduce emissions. Data we own at the moment that are considered particularly effective are those on pharmaceuticals used at the University Hospital and elsewhere. We have recently used publicly available data to identify the ratio between emissions from and sales of each of the major manufacturers from which we source pharmaceuticals. We have found that the ratio varies greatly depending on the product mix of each manufacturer. Manufacturers of small-lot and expensive biopharmaceuticals, in particular, tend to have a smaller emissions-to-sales ratio than ordinary manufacturers. Factoring in this tendency makes for more accurate quantification of emissions. It also makes it possible to better reflect reduction efforts by pharmaceutical manufacturers as many of these manufacturers are committed to decarbonization through SBTi and other frameworks.

Toward Reducing Scope 3 Emissions

UTokyo has a target of reducing Scope 3 emissions by 25% by fiscal 2030 from the baseline year of fiscal 2013. This is an extremely challenging and ambitious target in three aspects:

- A major restriction is that the target must not hamper educational or research activities in any way.
- UTokyo is an aggregate of many different departments and divisions, whose activities are extremely diverse. This makes it difficult to develop focused reduction action plans.
- As has already been mentioned, it is highly difficult to measure and evaluate (i.e., visualize) reduction efforts.

Scope 3 emissions are essentially expressed in terms of activity data multiplied by an emission factor. Thus, reducing Scope 3 emissions requires reducing either or both of these two values. With all these issues in mind, we will look into taking reduction actions as described below for major categories (excluding Category 3, which is linked to energy conservation).

In this context, it is worth noting that UTokyo has just established Division for Operational Transformation to undertake the initiatives of operational structure reforms and cost optimization through such means as consolidating operations, reviewing local rules, and reforming procurement practices. Many of the following reduction actions are closely related to these initiatives.

①Category 1 (purchased goods and services) and Category 2 (capital goods)

These two categories primarily represent emissions from purchasing/acquiring goods and services. They constitute the main source of emissions, accounting for more than half of Scope 3 emissions. Reducing their activity data requires reducing the amount of goods and services to be purchased or otherwise acquired. The overriding principle, however, is that such reduction must not hinder education and research activities (or medical care activities in the case of the University Hospital). Therefore, we need to eliminate unnecessary purchases and promote such activities as sharing laboratory equipment and reusing equipment on campus.

Efforts to share laboratory equipment have been made since 2011. The working group (WG) on wider sharing of laboratory equipment looked into accelerating these efforts in fiscal 2023. In February 2024, the WG came up with the policy on the sharing of laboratory equipment at UTokyo. Efforts have been also made to reuse no-longer-wanted goods on campus. The reality, however, is that many of such goods have been discarded without being reused due to the onerous task of inquiring the availability of such article. The Research Institute for an Inclusive Society through Engineering of UTokyo has developed a web-based platform for reuse unwanted articles called "ShareWel."[28] In November 2023, this platform began operations on a trial basis for the Graduate School of Engineering and the Graduate School of Information Science and Technology. The number of inquiries

27 Ministry of the Environment's "Green Purchasing Guide" p.172
https://www.env.go.jp/content/000311831.pdf (in Japanese)

28 https://sharewel.riise.u-tokyo.ac.jp/about/ (in Japanese)

received by ShareWel jumped five-fold by October 2024.

Another means to reduce emissions in these categories is to reduce the carbon footprint of goods and other items to be procured. Ways to reduce the carbon footprint of a product are largely divided into two types: efforts by suppliers to reduce emissions and selection of products (or suppliers) with lower emissions by purchasers. The former type can include evaluating suppliers' voluntary reduction efforts and proactively encouraging such efforts. Yet, because we do not have a fixed supply chain like businesses do, our action will likely revolve around information gathering from suppliers. As for the latter type, it is important to ensure that our purchasing activities are made in strict accordance with the Act on Promoting Green Purchasing, mentioned earlier. Yet another reduction means can be to replace any activity with an activity that emits less emissions. For example, digitizing paper materials can reduce the amount of paper purchased. Changing the practice of serving PET plastic-bottled beverages at meetings to the practice of serving such beverages in cups or the like can reduce the amount of PET plastic bottles purchased. To promote the use of electronic documents, instead of printed documents, the Center for Strategic Promotion of GX conducts awareness raising activities at Deans and Heads of Institutes Council. When conducting these activity replacements, it is important to evaluate the entire life cycle based on LCA.

Characteristically, purchases at UTokyo are largely made at the discretion of each research department; few are made intensively by university headquarters. It is thus important for each UTokyo member to understand the concept of Scope 3 and to behave in ways that minimize CO_2 emissions. Also, of importance is to thoroughly encourage such behavior changes on campus.

②Category 5 (waste)

Emissions in this category account for only a small proportion of total GHG emissions from UTokyo as a whole. Nevertheless, we consider this category an important theme for raising the awareness of UTokyo members on the need to reduce environmental burden and promote a circular economy. Specific actions to reduce Category 5 emissions include avoiding the generation of waste as much as possible and selecting approaches with the least environmental burden to process unavoidable waste. They also include promoting recycling plastics and other waste. Sorting waste such as separating plastics from combustible trash is important for household waste. We are planning to assess the impact of thorough sorting of waste on environmental burden reduction and to use the findings in awareness raising of UTokyo members. The water server installation activity described later in Section 4.3 is aimed at reducing the use of PET plastic bottles. This in turn helps reduce PET bottle waste as well.

③Category 6 (business travel)

For reducing Category 6 (business travel) emissions, behavioral change is a key factor. To encourage positive behavioral change, we believe it is necessary to inform UTokyo members about travel-related GHG emissions and ways to reduce them. The analysis of the travel expense data we conducted in the process of revising the calculation methods reaffirmed that the emissions from air travel make up a dominant proportion in this category.

The Institute for Future Initiatives looked into this issue in fiscal 2024 as a pilot project, with the central role played by the Carbon Offset Study Task Force made up of faculty members closely involved in GX. The outcomes of this project were complied into a set of social recommendations titled "A Study on Measures to Address Greenhouse Gas Emissions Associated with Official Trips by UTokyo" (in Japanese), which was released in February 2025.[29]

In response to the recommendations, the Center will start a trial system to pool voluntary contributions for business trips using aircraft from November 2025. In the future, we will expand these activities campus-wide to encourage UTokyo members to better understand CO_2 emissions associated with their business trips and to change their behaviors so as to reduce emissions.

29 "A Study on Measures to Address Greenhouse Gas Emissions Associated with Official Trips by UTokyo" (in Japanese)
https://ifi.u-tokyo.ac.jp/news/19549/ (in Japanese)

4

Social Contribution to Solving Climate Change

The most important mission of UTokyo is to contribute to human knowledge and to serve the public interest of the world as a world-class platform for research and education. UTokyo Climate Action is not only about achieving carbon neutrality as a business operator, but initiatives from the three perspectives of "knowledge," "people," and "place" which are the Basic Principles of UTokyo Compass are also an important aspect of our Climate Action.

Knowledge	**We will take leadership in driving green transformation (GX) in Japan and the world through its initiatives and create fundamental academic knowledge to drive GX.**
People	**We will foster human resources to lead GX of the world through education in various levels from literacy education to advanced specialized education.**
Place	**We will contribute to promoting GX in society through collaboration and co-creation with both internal and external stakeholders.**

4
1

Contribution through Initiatives and Research

UTokyo will, as a world-class research university, contribute to the promotion of GX through such initiatives as leading international GX, creating knowledge foundation and presenting a future society model by achieving a carbon neutral campus. Furthermore, UTokyo will consider quantitatively evaluating its GHG reduction contribution[30] made through knowledge creation to clarify its contribution as a university in the global fight against climate change.

Initiatives for global socioeconomic system transformation —UTokyo Center for Global Commons

Planetary boundary science demonstrates that today's economic system is pushing the Earth system beyond its stability and resilience—the very limits of the "Global Commons," our shared human heritage. To safeguard humanity's well-being and prevent drifting away from the "safe operating space" of the planet, an urgent transformation of our economic system is required. Seven of the nine planetary boundaries have already been breached, according to the latest scientific report published at the UN General Assembly in September 2025 by Professor Dr. Johan Rockström of the Potsdam Institute for Climate Impact Research. The Center for Global Commons (CGC) conducts pioneering activities that drive the transformation of socioeconomic systems through collaborative creation with leaders in a wide range of fields. The aim is to achieve the sustainable development of the Earth and humankind within the framework of Global Commons Stewardship. The following are some of its recent major initiatives:

①Organizing the Global Commons Forum (in October 2024 and October 2025)
https://ifi.u-tokyo.ac.jp/en/event/13879/
https://cgc.ifi.u-tokyo.ac.jp/gcf/en/

At the Global Commons Forum 2024, Professor Dr. Johan Rockström, the world-renowned proponent of the planetary boundaries concept, delivered a keynote address on the planet's health check, setting the stage for discussions by leaders from industry, government, and academia in Japan and abroad on strategies to avert this crisis and move toward a better future. In the sessions that followed the keynote speech, discussions were made with themes of Governing Global Commons, Nature Positive Economy and Finance, Pathway to Carbon Neutrality, and System Transformation and Resilience. Also at the forum, ETI-CGC, a platform of industry-academia collaboration established in November 2021 (https://cgc.ifi.u-tokyo.ac.jp/en/research-en/eti-cgc-en/), made a presentation on challenges and recommendations for "Net Zero Japan 2050," an interim report on decarbonization scenarios for 2050. The Global Commons Forum 2025, held in October 2025, business, policy and institutional experts discussed system transformation practices. The discussions were made placing focuses on the latest information on planetary boundaries science, acceleration of the transition to a new economic system through valuing natural capital, linking of local actions to the global perspectives, and building effective AI governance to support the transition.

Scene from the COP29 seminar

30 An increasing number of companies and other organizations have been calculating their avoided emissions in recent years. In July 2025, the World Business Council for Sustainable Development (WBCSD) released the Guidance on Avoided Emissions v2.0. (https://www.wbcsd.org/resources/guidance-on-avoided-emissions-helping-business-drive-innovations-and-scale-solutions-toward-net-zero/) Discussions are being made to decide whether the GHG Protocol will adopt the concept of avoided emissions in the next revision.

②Launching the Nature on the Balance Sheet partnership program (in September 2025)
https://cgc.ifi.u-tokyo.ac.jp/en/news/cgc-nbs_press_release_en/

The Center for Global Commons (CGC) is advancing the "Nature on the Balance Sheet" initiative, which aims to systematically assess the economic value of natural capital and integrate it into decision-making processes, including corporate financial statements. In September 2025, CGC established the industry–academia collaboration platform "CGC-NBS Partnership Program" to ensure that the perspectives of Japan and other Asian countries are reflected in international rulemaking under this initiative. Four leading Japanese companies that are profoundly involved in natural capital through their business activities joined this program as corporate sponsors.

Earlier, in November 2024, CGC held a seminar titled "Nature on the Balance Sheet" at the Japan Pavilion at the 29th Conference of the Parties to the United Nations Framework Convention on Climate Change (COP29), held in Baku, Republic of Azerbaijan.

(https://cgc.ifi.u-tokyo.ac.jp/en/topics/cop29-seminar/)

The seminar featured a panel discussion, which stressed that comprehensive and systematic policies are needed to prevent catastrophic environmental losses and fundamentally transform the current economic system. The panel concluded that international cooperation and public-private partnerships are crucial to that end. At COP 30, to be held in Brazil in November 2025, CGC will host a seminar at the Japan Pavilion and Standards Pavilion. The seminar will review the outcomes of the ongoing CGC-NBS project, discuss processes and a roadmap to achieve the project goal, and deliver the information on the initiatives made to a wider international community.

③Releasing "Planet Positive Chemicals in Japan", a report on the Japanese chemical industry's pathways and strategies to achieve net zero (in October 2024)
https://cgc.ifi.u-tokyo.ac.jp/en/research-en/chemistry-industry-en/

In September 2022, a joint research group between CGC and Systemiq, a UK firm, released Planet Positive Chemicals, a report on pathways for the global chemical industry to achieve net zero. In October 2024, the group also released a research report on pathways for the Japanese chemical industry to attain net zero, including Scope 3 targets. The new report proposes strategies and action guidelines that accommodate Japan's strengths and weaknesses. This was made possible by combining the knowledge of academic papers on quantitative pathways to achieve net zero in Japan with the knowledge on Japan and the Japanese chemical industry. This research project was funded by Mitsubishi Chemical Corporation.

④Releasing "Roles of Sustainable Fuels in Achieving Net Zero: a transition strategy for Japan with a focus on vehicles" (in September 2024)
https://cgc.ifi.u-tokyo.ac.jp/wp-content/uploads/2024/09/net-zero.pdf (in Japanese)

ETI-CGC conducts discussions and studies on pathways to achieve net zero under the unique conditions of Japan as well as on industrial structures and socioeconomic systems for the future. In June 2023, ETI-CGC published "Net Zero Japan 2050: Summary for Business Leaders." In September 2024, ETI-CGC and Mitsubishi Research Institute, Inc. jointly released a thematic report on the roles of sustainable fuels (e.g., hydrogen, synthetic fuels, and biofuels) in achieving Japan's net zero. By using quantitative models, the report demonstrated that as far as cars and trucks are concerned, sustainable fuels can play a mutually complementary role with vehicle electrification. It then offered recommendations on how to build supply chains to that end.

Unravelling the co-evolution of climate, ecosystems and human societies
—Center for Climate Solutions
https://utccs.u-tokyo.ac.jp/en/

The issue of climate change or global warming is now beyond the realm of natural science. A transformative science is required that encompasses a variety of approaches, including understanding and predicting climate change and assessing its impact on ecosystems, designing future social systems, bridging social gaps as represented by climate justice, and changing behavior towards carbon neutrality.

At the UTokyo Center for Climate Solutions (UTCCS) established in July 2022 with the participation of 13 collaborating departments and institutions across both natural and social sciences including the Atmosphere & Ocean Research Institute and Graduate School of Engineering, three research divisions corresponding to the IPCC's sectional structure, namely Division for Earth System Change, Division for Climate Impact on Ecological System, and Division for Human System Response engage in research activities, based on scientific evidence, in search of social systems that will enable mankind to overcome climate change.

Based on the findings of these research activities, Kiko hendo to shakai (Climate Change and Society: A Primer on Global Warming Issues) was published from the University of Tokyo Press in July 2024. The book gives systematic and simple explanation on subjects ranging from the fundamentals of climate change to climate solutions and sustainable development.

Furthermore, a new program led by UTCCS, Interdisciplinary Education Program on Sustainability, was launched in fiscal 2024. (See the next section.)

Achieving a carbon neutral society through energy systems —Collaborative Research Organization for Comprehensive Energy Sciences

https://www.croces.t.u-tokyo.ac.jp/

Issues related to energy have a significant impact on our daily lives. For example, now that making efforts to realize a carbon neutral society has become a legal responsibility, while we need to significantly increase the use of renewable energy, a wide range of scientific research on fossil fuel and nuclear power, as well as battery cells, hydrogen, and forest absorption of carbon dioxide (CO_2), is needed. The pursuit of solutions to energy issues not only requires deep understanding of technologies and legal and economic systems but essentially leads to philosophy and social ethics.

The Collaborative Research Organization for Comprehensive Energy Sciences (CROCES), established in July 2021 with the participation of 10 departments from both liberal arts and natural science, pursues wide ranging research and development as well as design of energy policies and systems under the following five themes: “analyses and syntheses of total energy systems” “Innovative renewable energy and storage technologies” “Innovative energy conversion, transportation, utilization and CO_2 reduction” “Energy policy, energy economics and management of global resources” and “Innovative materials and energy management to improve human comfort and health.”

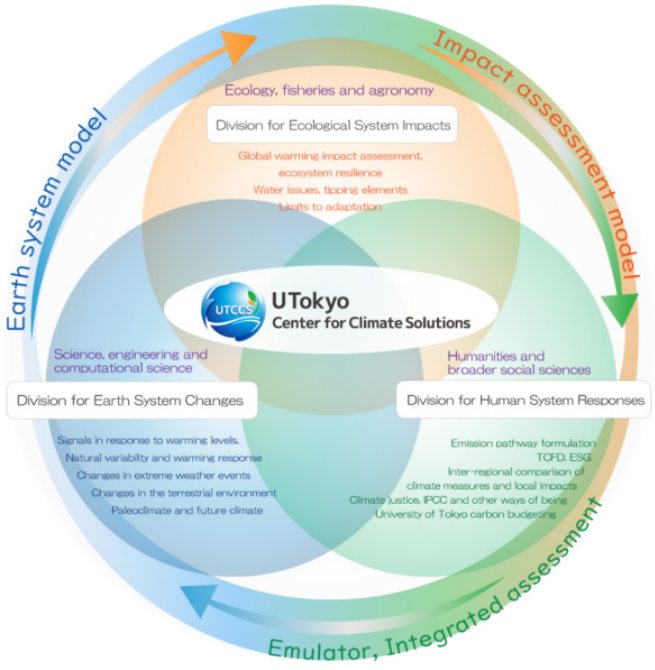

Figure 12 Organization and Research Themes of the Center for Climate Solutions

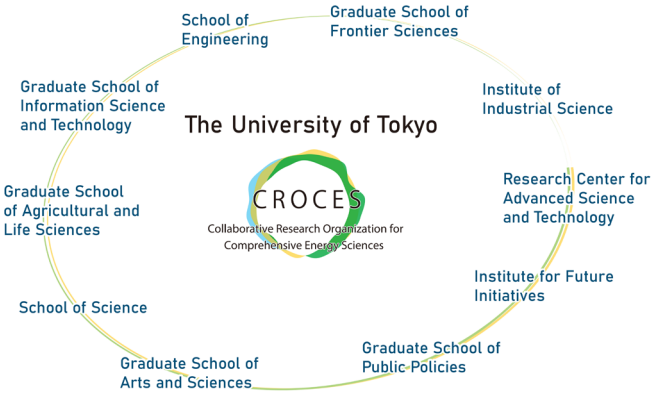

Figure 13 Organization and research themes of the Collaborative Research Organization for Comprehensive Energy Sciences

CROCES has established the Energy Transformation (EX) Workshop to promote discussions to realize a carbon neutral society through collaboration between UTokyo’s faculty members and businesses. As of July 2025, the workshop is operated with a membership of 30 companies.

As part of its training activities, CROCES launched the Comprehensive Energy Sciences Education Program in 2024 as a cross-faculty program. (See the next section.)

Building our future strategy now with advanced scientific technologies and preemptive LCA —UTokyo LCA Center for Future Strategy (UTLCA)

https://www.utlca.u-tokyo.ac.jp/en/

Drastic transformations of technologies and systems, such as transition to carbon neutrality and circular economy, are required to build a sustainable society. Various innovative and advanced scientific technologies are currently under research and development. These technologies need to be quantitatively assessed, while they are still in the development phase, for the effects they will have on society and the environment over their entire lifecycle when applied in future society, to clarify the required performance and other requirements and provide feedback to research and development.

The UTokyo LCA Center for Future Strategy (UTLCA) established in April 2023 brings together researchers in advanced science and technology and lifecycle assessment (LCA) experts from 10 UTokyo departments to evolve conventional LCA for assessing technologies in the present society into preemptive LCA that contributes to designing future society. It aims to build new theories that go beyond conventional disciplinary distinction through the establishment of standardized methods to assess

innovative technologies and research on integrated design of social systems with enhanced collaboration between consumption and production.

The Pre-emptive LCA Social Cooperation Research Department, centered on the Future Scenario Subcommittee and Resource Recycling Subcommittee, is now exploring visions for the future society in collaboration with 16 participating companies across materials, machinery, automotive, venous and other industries (as of September 2025), to establish preemptive LCA and put it into practice.

Forest GX: Forest resources contributing to carbon neutrality —The University of Tokyo Forests (UTF) affiliated to the Graduate School of Agricultural and Life Sciences and Forest GX/DX Co-Creation Center

The University of Tokyo Forests (UTF) https://www.uf.a.u-tokyo.ac.jp/english/

Forest GX/DX Co-Creation Center (FGDC) https://fgdc.uf.a.u-tokyo.ac.jp/english

The University of Tokyo Forests (UTF), affiliated to the Graduate School of Agricultural and Life Sciences, UTokyo, manages seven regional university forests with a total area (forest area) of some 32,300 ha across Japan. These university forests serve as fields for practical research and education on forests and forestry. They are estimated to absorb approx. 102,000 metric tons of CO_2, which accounts for more than 60% of energy-related CO_2 emissions from the UTokyo campus, according to calculations made in fiscal 2024 by the UTF Forest Management Committee. These forests serve not only as a valuable carbon sink but also as a place for educating graduate school students in cooperative courses established in the Department of Forest Science and the Department of Ecosystem Studies. UTF is on a mission to foster “forests to bridge science and the public.” Utilizing its strengths, such as the accumulation of long-term data that spans over 100 years and the practice of education and research in collaboration with the local community, UTF contributes to the green transformation of UTokyo through research on sustainable timber production and other initiatives.

At UTF, the former Field Data Research Center was reorganized and evolved into the Forest GX/DX Co-Creation Center (FGDC) in April 2024. Focused on forest resources, which cover two thirds of the land of Japan, FGDC works under the mission of creating a UTokyo model for realizing a decarbonized society. The

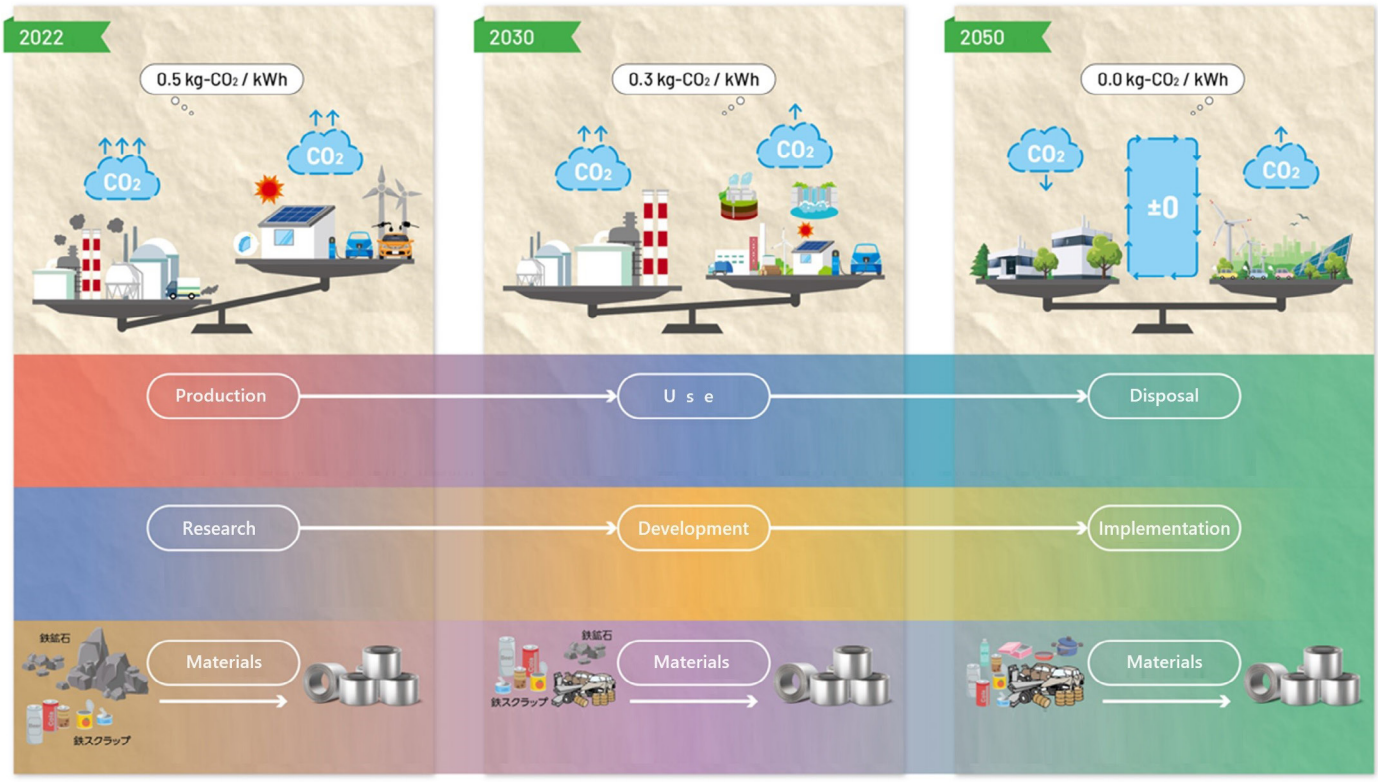

Figure 14 Relationship between social changes toward carbon neutrality by 2050 and social implementation of product lifecycle and new technologies

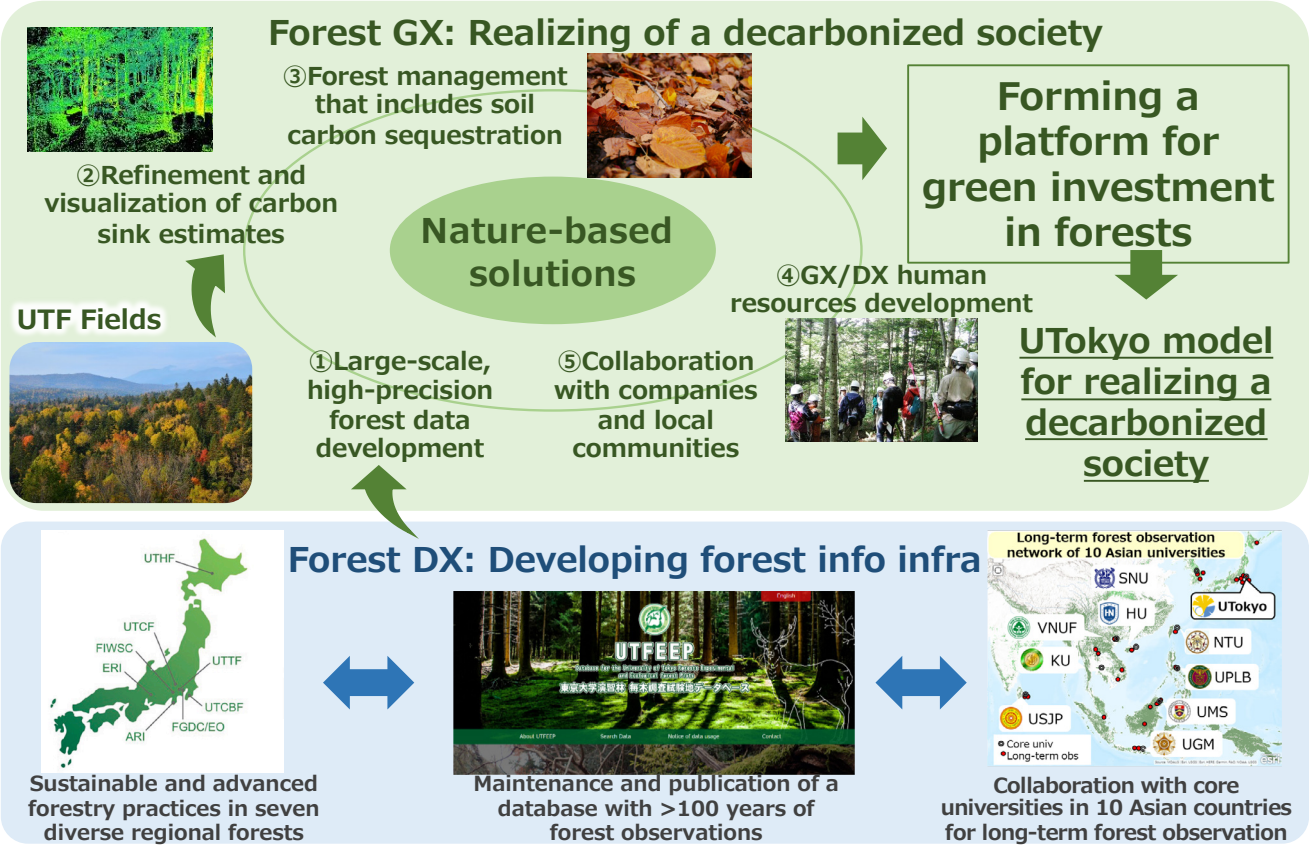

Figure 15 Functions of the Forest GX/DX Co-creation Center (FGDC)

center aims to form a platform to encourage green investment in forests through cross-departmental collaborative research in development of high-accuracy large-scale forest data and co-creation with the industry and society. FGDC is currently developing and implementing nature-based solutions to address the following 5 issues toward the conversion of socioeconomic systems necessary to realize a decarbonized society.

①Development of large-scale, high precision forest data
②Refinement and visualization of forest sink estimates
③Development of techniques for forest management that includes soil carbon sequestration
④Development of human resources for forest GX/DX
⑤Co-creation with companies, local governments, and local communities toward developing regional decarbonization plans

In addition, it is working to advance collaboration with other universities in Asia with a view to forming an Asian research center for forest GX/DX in the future. As part of such efforts, UTF organized the first International Symposium of Forest GX/DX in Asia in Vietnam in November 2024.

Research projects that contribute to the UN's 17 Sustainable Development Goals (SDGs)
——UTokyo Compass Initiative SDGs Project

https://www.u-tokyo.ac.jp/adm/uci/en/projects/sdgs/index.php

The Utokyo Compass Initiative SDGs Project lists research projects at UTokyo that contribute to the United Nations' 17 Sustainable Development Goals, with the aim of promoting synergies between research activities and ensuring the social impact of value created by these projects. The number of registered projects as of October 1, 2025 is 197.

Human Resource Development to Tackle Climate Change

UTokyo believes it has been entrusted by society with the mission to develop human resources who will take on leadership roles in a variety of fields both within Japan and around the world. This includes education on responding to climate change and driving green transformation. UTokyo will develop human resources that will lead global green transformation by developing and enhancing educational programs at all levels and fields: from literacy education for new undergraduate students to programs to develop advanced and specialized human resources, as well as recurrent education for working adults.
Website on GX education: https://www.u-tokyo.ac.jp/en/about/gx/education.html

1. Education Programs for New Students and Undergraduate Junior Division Students

University-wide sustainability (GX) literacy education

This is a new educational program launched in fiscal 2024 targeting at newly enrolled undergraduate students at UTokyo. It aims to share basic knowledge on green transformation, especially climate change issues. A video to introduce learning opportunities in the relevant fields has been released.

Links to videos (updated every fiscal year) are provided on the website on GX education. (See above)

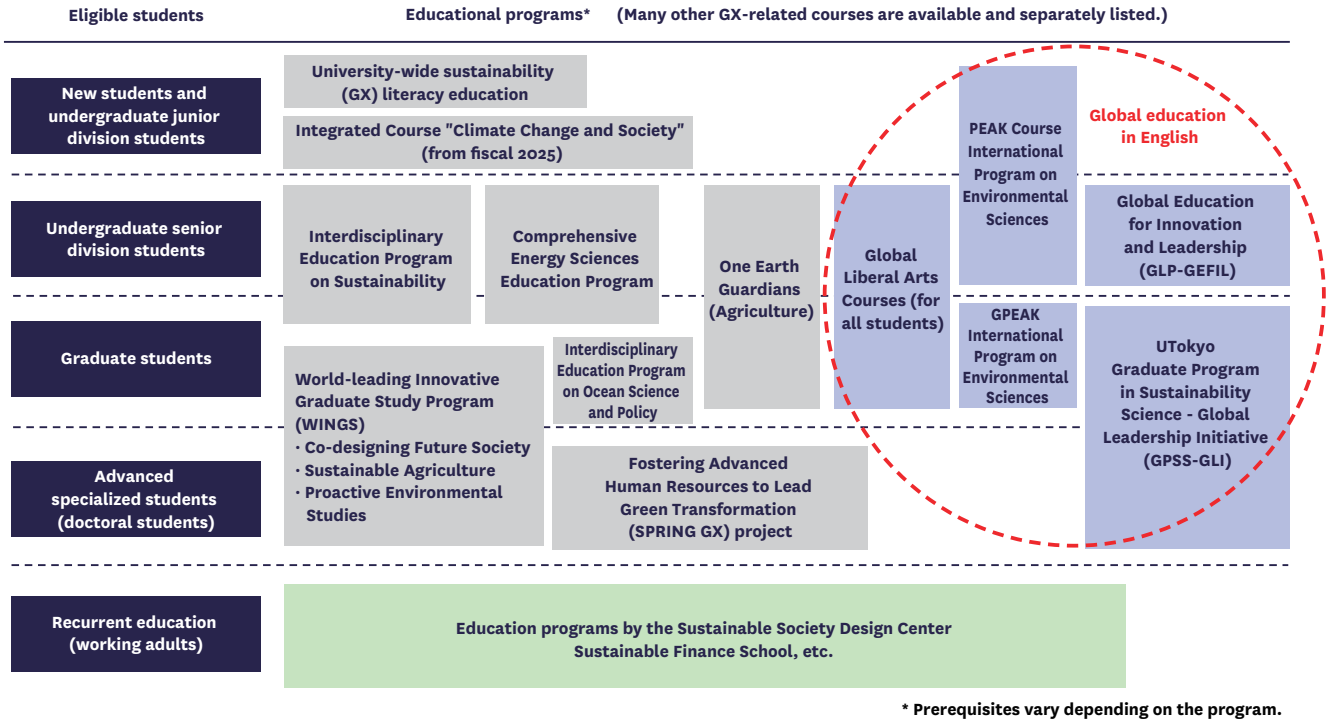

Figure 16 GX Education Program System

Integrated course for undergraduate junior division students: “Climate Change and Society”

https://utccs.u-tokyo.ac.jp/lecture/ (in Japanese)

This course was formerly given as an Academic Frontier Lecture Series from fiscal 2022. Since fiscal 2025, it has been offered as an integrated course (elective course) for undergraduate junior division students. This course consists of omnibus lectures by frontline researchers at the Center for Climate Solutions. It offers cross-disciplinary knowledge needed to realize a sustainable society in a changing climate. The course taps into studies in natural and social sciences and humanities.

2. Education programs for undergraduate senior division students and graduate students

Common Undergraduate and Graduate Courses Related to GX

https://www.u-tokyo.ac.jp/ja/students/special-activities/kyotsu-jugyo-kamoku.html (in Japanese)

UTokyo provides a portfolio of courses/classes based on the idea that students should take a wide range of courses without being bound to their field of study. Starting from fiscal 2023, we made all GX related courses offered in different departments more easily recognized (“visualized”) as common courses.

University-wide educational programs

UTokyo offers university-wide educational programs to connect the knowledge of different fields to solve emerging challenges. University-wide educational programs bundle the contents of lectures and exercises from multiple educational departments and offer them in line with a given theme. Students can take these courses on top of the courses in the curriculum given by their own department. The following two programs have been offered since fiscal 2024. Although both programs are designed for undergraduate senior division students, graduate students can also participate in the program. A certificate will be conferred upon completion of a certain number of credits

<Interdisciplinary Education Program on Sustainability>

https://utccs.u-tokyo.ac.jp/program/

Mainly run by the Center for Climate Solution, this program is designed to provide comprehensive and systematic knowledge in sustainability to those who will pursue their career in different fields after graduation. Specific themes addressed in the course include interactions between the environment, economy, and society; knowledge on technologies and systems necessary for delivering GX; and philosophy, ethics, and culture appropriate for a sustainable society.

<Comprehensive Energy Sciences Education Program>

https://www.croces.t.u-tokyo.ac.jp/education/ (in Japanese)

This is a program run mainly by the Collaborative Research Organization for Comprehensive Energy Sciences beyond existing disciplinary boundaries. It aims to develop human resources who own basic knowledge in techniques and principles about energy, and can therefore propose and implement solutions from a broad perspective based on relevant legal and economic systems as well as philosophy and ethics.

University-wide graduate educational programs

<Interdisciplinary Education Program on Ocean Science and Policy>

https://www.oa.u-tokyo.ac.jp/education/program/index.html

Whether the issue is about marine resources or measures to fight global warming, solving the various problems facing oceans today requires a broad perspective and profound expertise across the areas of science and humanities. Run by the UTokyo Ocean Alliance, this program is a field-work based interdisciplinary education program covering both science and humanity fields. It is designed to develop human resources with broad knowledge about oceans.

One Earth Guardians Development Program

https://www.one-earth-g.a.u-tokyo.ac.jp/en/

This is an educational program offered by the Graduate School of Agricultural and Life Sciences, Faculty of Agriculture, aimed at developing One Earth Guardians, who will take actions to secure the future of the Earth for the next 100 years as a place where all living beings, including humans, coexist in harmony. It is run with the participation of many supporters from within UTokyo and supporting companies, foundations, and institutions as a forum for co-creation.

3. Programs to Develop Advanced Specialized Human Resources

World-leading Innovative Graduate Study Program (WINGS)

This is a master's-doctoral (or bachelor-master's-doctoral) degree program created through collaboration among the university's graduate schools and research institutes, in order to create doctorate-level researchers who contribute their high-level research abilities and expertise to human society.

<World-leading Innovative Graduate Study Program Co-designing Future Society (WINGS-CFS)>
https://cfs.t.u-tokyo.ac.jp/

This program is designed to develop human resources capable of "co-designing future society," in other words, highly knowledgeable professionals who can envision the ideal future, co-create with stakeholders to realize innovation, and realize social implementation of such innovation.

<World-leading Innovative Graduate Study Program of the Sustainable Agriculture Education Program>
https://utsaep.wixsite.com/site

To meet the challenge to increase the productivity of agriculture, forestry and fisheries in the face of climate change while minimizing the environmental impact on a global scale, this program provides an education integrating agricultural science and advanced information science, with a goal to produce skilled scientists who are indispensable today.

<World-leading Innovative Graduate Study Program in Proactive Environmental Studies (WINGS-PES)>
https://wings-pes.edu.k.u-tokyo.ac.jp/en/

Taking advantage of the multi-disciplinary characteristics unique to the Graduate School of Frontier Sciences (GSFS) and also benefiting from the location in the Kashiwa Campus, which is ideally suited for the promotion of educational and research exchange with world-leading research centers, this program aims to develop "Environmental Knowledge Professionals" who can anticipate future issues and clearly show the direction the global society should move toward, by taking proactive approaches based on prediction technologies.

Fostering Advanced Human Resources to Lead Green Transformation (SPRING GX) project

https://www.cis-trans.jp/spring_gx/index-e.html

The project has been accepted as a program for the Support for Pioneering Research Initiated by Next Generation (SPRING) of the Japan Science and Technology Agency (JST) from autumn, 2021 (hereafter "SPRING GX"). Doctoral students (including those in four-year programs) from all schools of UTokyo participate in this project. By investing all available assets of UTokyo, the SPRING GX aims to produce globally competent researchers who will contribute to the large-scale realization of a GX across all fields. The program was initially started with about 600 students. Following JST's second open call for students, the new SPRING GX program was started in April 2024 with 1,154 students enrolled. The number of enrollments increased to 1,315 in April 2025.

4. Global Education Program

PEAK International Program on Environmental Sciences

https://peak.c.u-tokyo.ac.jp/courses/es/index.html

Programs in English at Komaba (PEAK) are undergraduate courses taught entirely in English. In the International Program on Environmental Sciences course, students study a wide range of fields related to environmental systems and earth science.

Global Education for Innovation and Leadership (GLP-GEFIL)

https://www.glp.u-tokyo.ac.jp/en/gefil/

This is a special transdisciplinary educational program taught in English for qualified students selected from undergraduate senior division students and includes sustainability as a component of the program.

Global Liberal Arts Courses

https://globe.u-tokyo.ac.jp/en/globalliberalarts.html

Established in 2023, these courses offer opportunities for all undergraduate senior division students and graduate students to study in English about transdisciplinary topics relating to the sustainable development goals or SDGs.

The UTokyo Graduate Program in Sustainability Science - Global Leadership Initiative (GPSS-GLI)

https://www.sustainability.k.u-tokyo.ac.jp/en/

These all-English programs organized by the Sustainable Society Design Center of GSFS attract students with diverse nationalities, cultures, and skill sets from around the world. They were designed to provide education centered around practical exercises where students collaborate on specific sustainability issues and experience the entire process from the identification of the key problems, to the understanding of the complex structure and different perspectives of various stakeholders, and the proposal of solutions. As a pioneering graduate program that confers a doctor's degree in sustainability science, GPSS-GLI may be considered a world leading educational program in the field.

5. Recurrent Education for Working Adults

https://www.k.u-tokyo.ac.jp/en/gsfs/center/sustainable/

The Sustainable Society Design Center offers three education programs targeted at young to middle-aged working adults. Among them, the Sustainable Finance School aims to deepen students' understanding of global challenges that form the backdrop to sustainable finance, help acquire basic scientific knowledge of sustainability and finance, and at the same time cultivate knowledge, skills, ideas, and management and coordination abilities necessary for practicing sustainable finance. Other examples include the Smart City School aimed at creating leaders who will build smart cities and deliver the digital transformation of cities and regions, as well as the System Design School, where the theory and practice of planning/exploring technological systems and business transformation are learned through a system design approach.

4
3

Dialogue, Collaboration and Co-creation with Stakeholders

UTokyo will exercise ingenuity to fully and comprehensively utilize its resources as a university and become the starting point of a bridge with society through creative dialogue. To contribute to the green transformation of society as a whole, UTokyo will promote dialogue and co-creation with all stakeholders, both internally (with faculty, staff, and students) and externally (with citizens, businesses, governments, other institutions, etc.).

Student-led Activities and Collaboration with Students

<Activities of the UTokyo GX Student Network (GXSN)>
https://www.utokyo-gxsn.org/?lang=en

At UTokyo, sustainability activities have been actively carried out by a variety of student groups in environmental studies. To strengthen support from the university administration to these student activities, the TSCP Student Committee was integrated with UTSN in June 2023 to newly form the GX Student Network (GXSN) as a student organization officially recognized by the university administration. GXSN maintains energetic activities in cooperation with the Center for Strategic Promotion of GX and other related departments. GXSN enjoys a diverse membership of both undergraduate students and graduate students, including not only Japanese but international students.

As of September 2025, GXSN runs eight projects, each of which is operated independently with its own activity goal. The central council is responsible for the administration of GXSN as a whole and for coordination with the university administration. (https://www.utokyo-gxsn.org/projects?lang=en)

· 2024 UTokyo Student Survey on Sustainability Awareness

This survey was formerly conducted by the TSCP Student Committee, one of the predecessors to GXSN. In the latest survey, conducted in December 2024, responses were collected from 427 undergraduate and graduate students at UTokyo. The results showed that about half of the respondents said environmental issues were in some way a factor in making their career choices. This tendency was higher for students whose research subjects were related to environmental issues. The results of the survey were included in the poster presentation by GXSN at the meeting of the Institute of Life Cycle Assessment, Japan, held in March 2025 at Hiroshima Prefectural University. The presentation received valuable feedback from researchers from many universities.

· Sustainability Week 2025
https://www.utokyo-gxsn.org/news/sustainability-week-2025?lang=en

GXSN organized Sustainability Week 2025, the third of its kind, in June 2025. In closer collaboration with UTokyo Co-op, the 2025 event featured activities designed to bring sustainability closer to everyday campus life. These included jointly developing a special menu at co-op cafeterias, offering pop-up experiences at co-op stores, and promoting the collection of recyclable containers for meals. The collaborative menu featured ethnic Asian dishes specially designed to avoid the use of animal meat or fish as much as possible. The special dishes were very popular and sold out on some days.

On the final day of the week, GXSN wrapped up the annual event with a special program themed around “Climate Change × Music.” The program was organized in partnership with Climate Live Japan.

Participants in the “finale” program

· Water Server Project
https://www.utokyo-gxsn.org/water-server?lang=en

The aim of this project is to reduce the use of disposable beverage containers and plastic straws, raise students’ environmental awareness, encourage a shift to a more sustainable lifestyle, and to enhance the welfare and convenience of the university community. GXSN installed water servers on Komaba I Campus for the first time in the spring of 2023,

and later on Komaba II, Hongo, and Kashiwa campuses. Their number is increasing year by year. GXSN updates water server maps and continues monitoring the amounts of water supply on Komaba I Campus. In fiscal 2024, the water servers supplied a total of about 210,000 liters of water, which is equivalent to some 420,000 Plastic (PET) bottles (500 mL) of water. The total amount of water supplied by the end of September 2025 since the monitoring began in fiscal 2023 was equivalent to about one million plastic bottles of water.

・Participation in international conferences

https://www.utokyo-gxsn.org/news/cop2024?lang=en

https://www.utokyo-gxsn.org/news/cop16-cop29?lang=en

During fiscal 2024, GXSN sent a total of three students to two major international conferences: one to the 16th Conference of Parties to the Convention on Biological Diversity (COP16) held in October in Cali, Colombia; and two to the 29th Conference of Parties to the United Nations Framework Convention on Climate Change (COP29) held in November in Baku, Azerbaijan. The students participated in side events and organized events at the pavilions of university consortiums. The accomplishment of these students was reported to the March 2025 meeting of the Advisory Board of the UTokyo Compass Initiative, which is made up of UTokyo President Teruo Fujii and external experts. The students received a variety of valuable feedback from the meeting members.

(Photo above) Convention on Biological Diversity, COP16
(Photo below) UN Framework Convention on Climate Change, COP29

・Other events and activities

https://www.utokyo-gxsn.org/news?lang=en

GXSN is engaged in many other activities. Among them is organizing various events, including an event that features the “Climate Fresk” card game designed to learn about climate change, as well as the “BioBlitz” creature field study aimed at learning biodiversity. Yet other activities include participating in various symposiums and events organized by universities and local governments and working with UTokyo Co-op to reduce food loss.

<Environmental measures taken by the May Festival Standing Committee>

https://gogatsusai.jp/committee/disclosures/documents/eco-report (in Japanese)

As the name suggests, the May Festival is a campus festival held every May on the Hongo and Yayoi campuses of UTokyo. The time-honored event marks the 98th anniversary in fiscal 2025. As it is a major event visited by more than 100,000 people every year (some 150,000 visitors in fiscal 2025), the event management entails social responsibility.

The May Festival Standing Committee, made up of some 270 students, prepares and releases an environmental assessment report on the festival, starting from fiscal 2024, for the sustainable management of the event.

The second environmental assessment report (for 2025) makes additional attempts to quantify the environmental burden of the May Festival. A special focus is placed on identifying the means of procuring supplies to minimize the environmental burden as well as on estimating CO_2 emissions from fuel combustion and waste treatment. The report also states that the Standing Committee will identify the challenges ahead and build a sustainable system for supporting environmental actions through such means of awareness building for committee members and collaboration and dialogue with both internal and external stakeholders.

Collaboration with Other Universities in Bunkyo Ward

https://www.u-tokyo.ac.jp/ja/about/actions/gx/news.html (in Japanese)

On November 15, 2024, universities located in Bunkyo Ward held the third meeting of networking and view exchange to share their sustainability-related initiatives. The meeting took place in the Sky Hall on the 26th floor of the Bunkyo Civic Center. The number of universities participated increased from five in the first meeting in fiscal 2022 to 11 this year, and vigorous exchange of opinions was conducted.

A student from GXSN at UTokyo reported on how GXSN's initiative to install water servers on campus has changed the behaviors of students.

Community Collaboration

<Collaboration in Bunkyo Ward>

https://www.u-tokyo.ac.jp/focus/ja/press/z1313_00012.html (in Japanese)

Bunkyo Ward, where Hongo Campus is located, is committed to reducing CO_2 emissions under the declaration it made in April 2022 to become a zero-carbon city by 2050. In March 2024, UTokyo signed an agreement of cooperation toward green transformation with Bunkyo Ward. Under the agreement, the two parties are working more closely to address challenges in promoting GX in Bunkyo Ward.

Taking advantage of TMG's subsidy programs designed to promote zero emissions, we will put the knowledge and technology we gain through the implementation of the BCM project at campus to good use for the community. We aim to build a framework for city-wide sustainable energy management.

<Decarbonization strategic initiatives in Kashiwa>

https://www.kashiwanoha-smartcity.com/energy/

The Kashiwa-no-Ha area of Kashiwa City, where Kashiwa Campus is located, is undergoing the "Kashiwa-no-ha Smart City" project, an urban development undertaking through co-creation by the public, private, and academic sectors. Recognizing that energy constitutes an important category along with life science and mobility, we work under three themes toward a zero-carbon society: energy creation, power stabilization, and general use of green power.

The urban development project is led by Urban Design Center

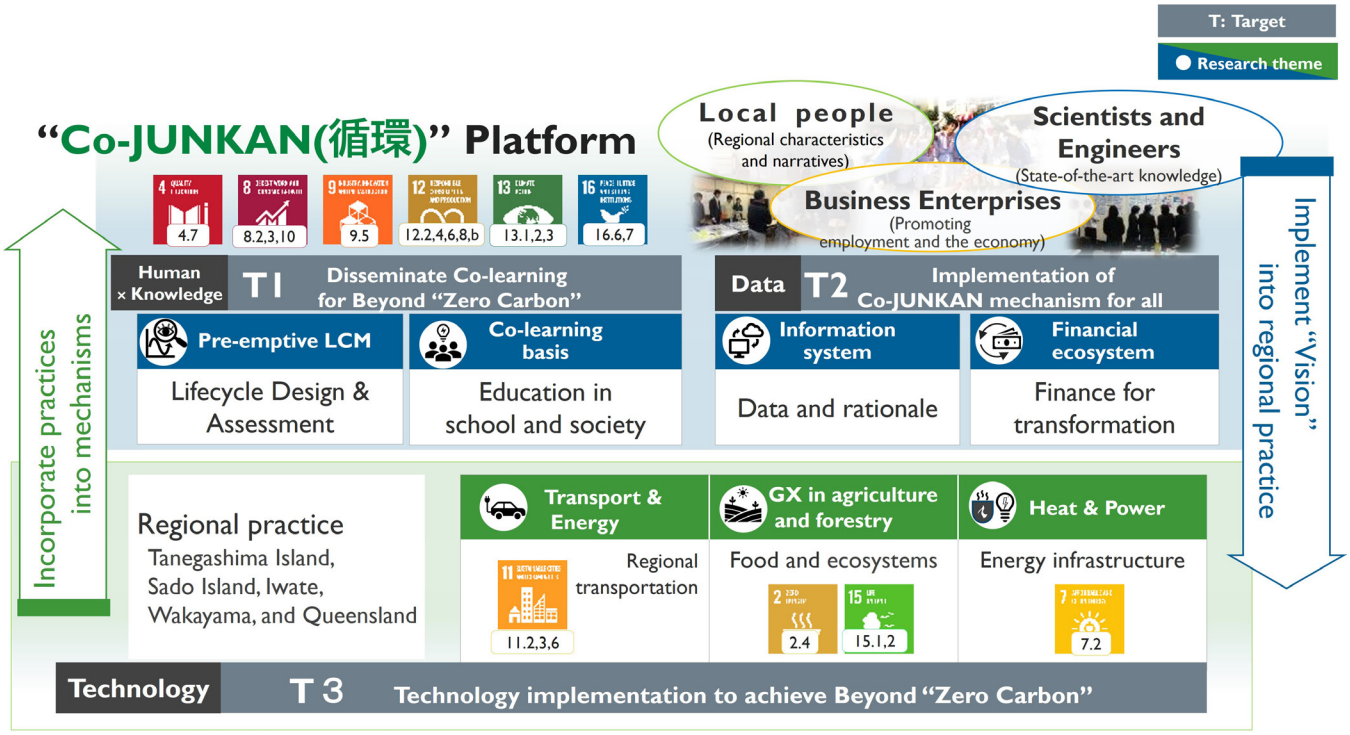

Figure 17 Concept of the Co-JUNKAN Platform

Kashiwa-no-ha (UDCK), a voluntary body jointly managed by eight organizations directly involved in the urban development project, including UTokyo, Kashiwa City, Chiba University, and Mitsui Fudosan. As an initiative of the Decarbonization Working Group, which was set up in fiscal 2023, UDCK has generated a draft Kashiwa-no-ha Decarbonization Strategy. The draft strategy sets out the goal of "52% reduction from Business as Usual (BAU) emissions by 2030," along with a set of measures and targets to achieve this goal.

<Program on Open Innovation Platforms for Industry-academia Co-creation (COI-NEXT)>

https://coinext.ifi.u-tokyo.ac.jp/en/index.html

Through this program, a research center has been established in the Institute for Future Initiatives. It aims to develop and implement a Co-JUNKAN platform, where technology, knowledge, and human resources can be organically integrated and circulated in partnership among private, academic, and local community sectors towards Beyond Zero Carbon. Various entities including universities, research institutions, businesses, and local governments are participating in the program.

One of the research themes of the research center is GX in agriculture and forestry. In February 2025, the center succeeded in a demonstration test that combusted a novel biofuel, which was derived from biomass produced on Tanegashima Island, in a diesel engine to generate electricity. The successful test was conducted at the Okinawa Tracking and Communications Station of the Japan Aerospace Exploration Agency (JAXA). (https://ifi.u-tokyo.ac.jp/en/news/13330/)

Collaboration related to GX themes

<Upgrading the value of natural capital: Forest GX>

https://www.u-tokyo.ac.jp/focus/ja/press/z1313_00002.html (in Japanese)

https://www.u-tokyo.ac.jp/focus/ja/articles/z0701_00006.html (in Japanese)

https://www.u-tokyo.ac.jp/focus/en/articles/z1701_00060.html

As has been described in Section 4.1, UTokyo identifies forest GX as one of the pillars of its GX undertaking. The idea is to capitalize on the valuable knowledge it has accumulated over 100 years in the forests owned by UTokyo (university forests). As a step to further expand the forest GX initiative across the country, we have forged an agreement of collaboration with two universities that also own forests.

In November 2024, we concluded an agreement with Hokkaido University. Hokkaido University has experimental forests with a total area equivalent to approximately 0.2% of Japan's land area. Combined with UTokyo forests, the total area accounts for about 75% of all university forests in Japan. Effectively using these vast forest resources, we aim to develop GX human resources, promote GX R&D, and put the outcomes of such R&D to good use for society (social implementation).

In April 2025, we signed a comprehensive agreement of collaboration and cooperation with Akita Prefectural University (APU). Situated in Noshiro City, known as a "wood city," APU's Institute of Wood Technology is the only technical education and research institution affiliated with a university that contains the word "wood" in its name.

These three universities, each of which has unique characteristics, interpret the entire life cycle of forest resources as having in a three-layer structure (upstream, middle, and downstream)" and work together to perform research and implementation in an integrated manner at each level.

The Ceremony for signing the agreement with Hokkaido University

The Ceremony for signing the agreement with APU

The Ceremony for signing the agreement with the SMBC Group

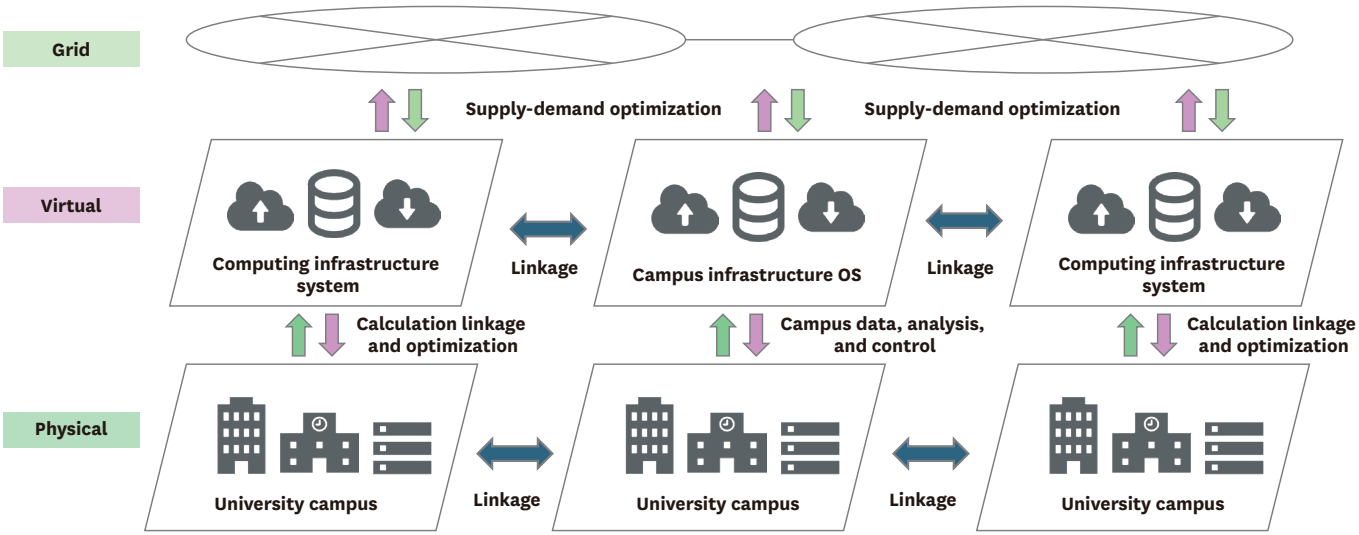

Figure 18 Concept of Inter-University Watt-Bit Collaboration

On the back of these inter-university collaboration initiatives in forest GX, UTokyo in April 2025 signed a partnership agreement with the Sumitomo Mitsui Financial Group (the SMBC Group) in five priority areas, including forest GX. The SMBC Group agreed to offer financial support totaling over three billion yen over three years in forest GX and other areas. This support strongly bolsters the GX promotion structure involving the three universities.

<GX that connects electric power and information: Watt-Bit collaboration>

https://www.u-tokyo.ac.jp/focus/en/articles/z1313_00025.html

When it comes to electric power, power consumption at data centers is an unavoidable issue. In October 2025, UTokyo and TEPCO Power Grid, Inc. jointly announced the launch of verification tests on a GX model that links “watt” (electric power)” and “bit (communication technology)”.

Power demand for computing is surging due to the ever-growing use of AI and high-performance computing. Meanwhile, there are growing cases in which renewable energy such as sunlight cannot be fully utilized owing to output control stemming from demand-supply imbalances.

The watt-bit collaboration project is designed to solve these two problems at the same time. This can be done by simultaneously realizing both effective use of renewable energy and power load balancing at data centers. This, in turn, can be achieved by performing calculation processing during hours, and in regions, when/where power is in excess supply and transferring the outcomes of such arrangements (information) via optical fiber.

Mainframes at universities in Japan are connected to one another through the Science Information NETwork (SINET). The project aims to spread watt-bit collaboration across society as a university-derived GX model by upgrading the industry-university collaboration to inter-regional university collaboration.

Communication with UTokyo Members

<Internal awards>

The Operational Reform Promotion WG solicits operational reform ideas and departmental best practices from faculty and staff members and shares the findings across the university. Ideas and practices with good potential for improvement are promoted for university-wide adoption with the cooperation of related departments. The ideas that have proved to be particularly effective are given the UTokyo President’s Award for Operational Reform and other awards. As in fiscal 2024, one of the focus themes for this award in fiscal 2025 is “Operational efforts in consideration of DX, D&I, and GX.” In fiscal 2024, the ShareWel initiative (described in Section 3.3) was granted the UTokyo President’s Award, the highest award.

We are also considering the launch of a new GX-related awards system to keep promoting these initiatives by university members across the entire university.

Information Communication to Society

<UTokyo Green Transformation Fund>

https://utf.u-tokyo.ac.jp/project/pjt165 (in Japanese)

Since fiscal 2023, UTokyo has been operating the UTokyo GX Fund. The fund is used to finance various actions, including promoting UTokyo CA, supporting student activities, enhancing the functioning of communicating information on the university's GX-related activities, and sending a delegation to the UN Climate Change Conference (COP).

About the GX logo

UTokyo Green Transformation

The logo visually expresses green transformation by showing how the color green emerges from the yellow and light-blue ginkgo leaves — the symbol of UTokyo — as they rotate and blend in color. It also aims to reflect UTokyo's active approach to GX in how the ginkgo leaves transform themselves while maintaining their original form.

UTokyo
Green
Transformation