

CUC Proposal against United Nations Race to Zero Campaign on Greenhouse Gas Emissions:

Estimating Supply Chain Emissions and Our Future Plans Toward Net Zero Societies

Natural Energy 100% University and Greenhouse Gas (GHG) Emissions: In recent years, Chiba University of Commerce (CUC) has garnered significant attention as Japan's first university committed to 100% renewable energy. This initiative traces its origins back to 2013 when the current president, Prof. Sachihiko Harashina, along with fellow faculty members, organized a series of six public lectures titled "Considering Sustainable Environmental and Energy Policies." In 2014, the university announced its ambition to become a 100% renewable energy institution, conducting various activities such as feasibility studies and open events. In 2016, CUC management established a related company, CUC Energy Co., Ltd. as part of these efforts. When Prof. Harashina became a president of CUC in 2017, the President's Project launched, declaring its commitment to becoming a 100% renewable energy university both nationally and internationally. Subsequent investments in energy-efficient LED lighting, solar power facilities, and awareness campaigns enabled CUC to achieve 100% renewable energy in electricity, a first among Japanese universities, in 2019.

Building on this achievement, CUC joined the Race to Zero campaign in February 2021. As the first step, CUC set the goal to achieve Scope 1 and Scope 2 targets according to the "GHG Protocol" before the fiscal year 2025. We further expanded its efforts by increasing rooftop solar installations and mega-solar power generation facilities. Simultaneously, energy-efficient initiatives, including LED lighting implementation and the introduction of an Energy Management System (EMS), significantly reduced consumption. Constant monitoring and monthly calculations in Joules enabled the university to track its progress toward the 100% renewable energy goal.

In the current global context, where climate change and global warming are paramount concerns, CUC's practice of the university version of RE100 is not only significant but also an inevitable progression. Participating in the Race to Zero Circle allows the university not only to disclose its GHG emissions but also actively engage in the global race to achieve zero emissions, aligning with international GHG protocol standards. This endeavor represents the university's social responsibility.

Estimation of Supply Chain Emissions: CUC's attempt to calculate GHG emissions not only for Scope 1 and Scope 2 but also for Scope 3, following the GHG Protocol, marks a pioneering

effort. Based on the “Basic Guidelines for Calculating Greenhouse Gas Emissions through Supply Chains” (Ministry of the Environment and Ministry of Economy, Trade, and Industry, Japan), we have estimated its supply chain emissions to reveal the GHG reduction achieved through its 100% renewable energy initiatives, considering the base year as 2016.

Figure 1 illustrates the changes in Scope 1 and Scope 2 emissions over time. Scope 1 includes emissions from city gas combustion for gas heat pumps and gasoline combustion for university vehicles. Reductions in emissions from city gas combustion data were gathered from the records between 2019 and 2020. Scope 2 represents emissions from electricity usage procured from retail electricity providers. Emission reductions from 2017 to 2018 were primarily due to the transition to LED lighting. Furthermore, the switch to electricity procurement from CDP-certified renewable energy providers led to significant emission reductions from 2019 onwards.

While estimating GHG emissions for Scope 1 and Scope 2 was relatively straightforward due to continuous monitoring, Scope 3 estimations, which encompass upstream and downstream activities beyond energy, are a great challenge. The estimation must utilize the “Emission Unit Database for Calculating Greenhouse Gas Emissions through Organization’s Supply Chains (Ver.3.3).” Figure 2 illustrates the estimated Scope 3 emissions stacked on top of Scope 1 and Scope 2 emissions. Notably, in the fiscal year 2022, Scope 3 emissions far exceeded those of Scope 1 and Scope 2. Within Scope 3 emissions, “Capital Goods” (Category 2) accounted for 60% of the total, followed by “Purchased Products and Services” (Category 1) at approximately 20%. Challenges arise due to the difficulty in assessing yearly changes using the current emission calculation method based on purchase amounts.

Future Plan: The “JCI Race to Zero Circle Mid-term Minimum Criteria” Ver. 3.0 stipulates a combined annual reduction of 4.2% for Scope 1 and Scope 2 and a total reduction of at least 2.5% per year for Scope 3, starting from the base year until the declaration year (Pledge) and continuing until 2031. Conversely, SBTi (2021) aims to halve GHG emissions by 2030 and achieve net-zero emissions by 2050. Considering CUC’s post-base year GHG emissions, Figure 3 examines the conditions necessary to meet these requirements.

Figure 3 presents GHG emissions (tCO₂) for Scope 1, Scope 2, and Scope 3 from 2016 to 2022. To fulfill the JCI Minimum Criteria, drawing a straight line from the base year of 2016 to the declaration year of 2021 and extending it to 2031 aligns with the Net-Zero Target of 2040. Adhering to this guideline allows for a 50% reduction before 2030, making an Interim Target of 2030 feasible. By setting the GHG emissions reduction at 50% by 2030 and achieving net-zero emissions by 2040, CUC would meet the SBTi (2021) targets.

In the short to medium term leading up to the Interim Target, CUC has already surpassed the JCI Minimum Criteria for Scope 1 and Scope 2 emissions by 2022. However, achieving the Net-Zero Target necessitates expeditious electrification of gas and gasoline, considering the lifespan of existing facilities. Transition measures such as carbon-neutral gas and certificate utilization could be explored as options. Additionally, increasing self-consumption solar power and implementing further energy-saving measures are essential for cost-effective electrification.

The most challenging aspect lies in reducing Scope 3 emissions. To fulfill the JCI Minimum Criteria, a reduction of approximately 30% of the current Scope 3 emissions must be achieved by around 2030. Furthermore, an ambitious goal is to achieve net-zero emissions in the following ten years. The recalibration of data collection and estimation methods is essential for Scope 3 emissions. Strongly urging upstream and downstream related business entities to disclose reduced emission units becomes crucial. For CUC, the Race to Zero now focuses not only on its own 100% renewable energy initiatives but also on advocating for net-zero emissions throughout the entire supply chain.

Figure 1 The changes of GHG (tCO₂) Emissions in Scope 1 and Scope 2 over time

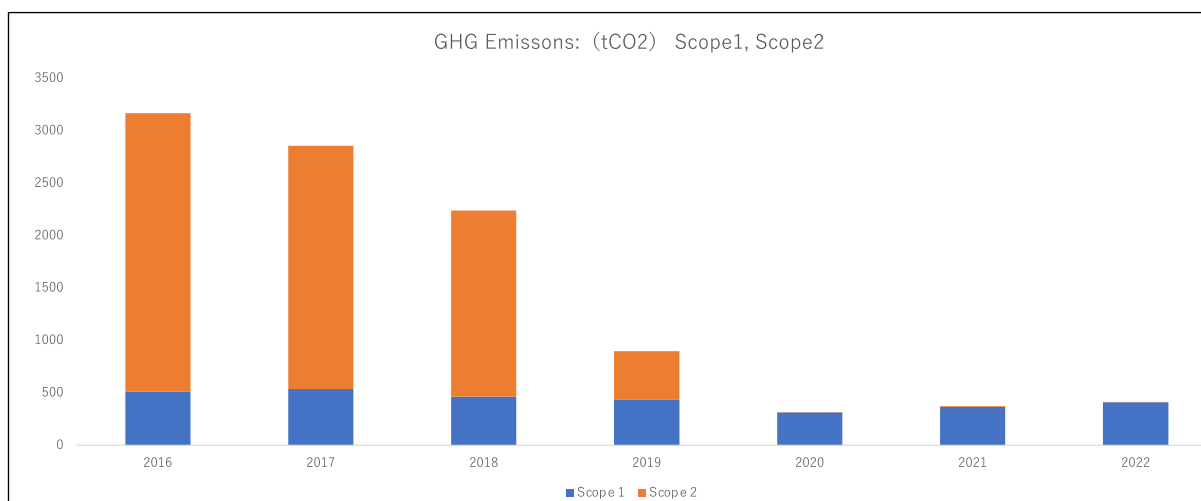


Figure 2 GHG (tCO2) Emissions in 2022 Fiscal Year

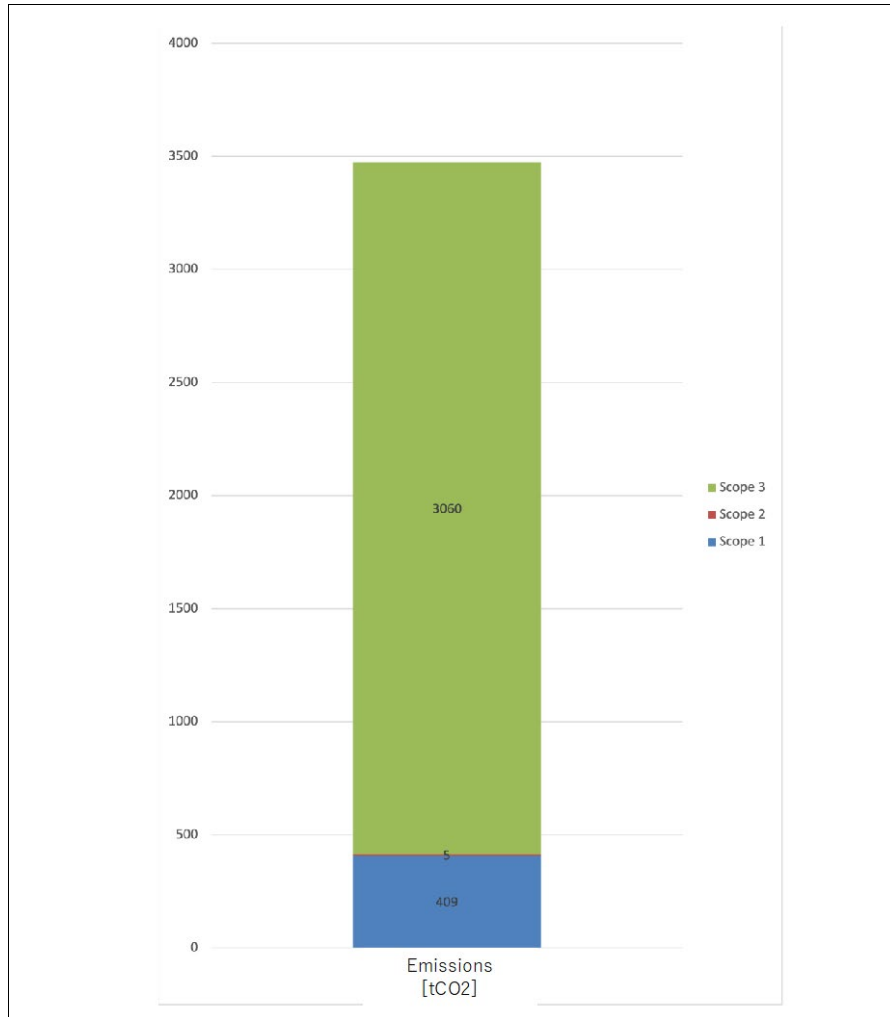


Figure 3 Target Scenario toward Net-Zero GHG (tCO2) Emissions

