

## Promotion of Watt-Bit Collaboration Project to Achieve Green Transformation

World's first watt-bit collaboration optimization model experiment to be carried out  
at the University of Tokyo campus

October 8, 2025

The University of Tokyo

TEPCO Power Grid, Inc.

The University of Tokyo (President: Teruo Fujii) and TEPCO Power Grid, Inc. (Head Office: Chiyoda-ku, Tokyo; President & Chief Executive Officer: Yoshinori Kaneko; “TEPCO PG”) are teaming up to trailblaze a watt-bit optimization model that leverages the attributes of information and communication technology (“bit”) to optimize power (“watt”) demand in order to promote green transformation at the University of Tokyo and build new models for a sustainable society.

The University of Tokyo already promotes the use of renewable energies and the spatial/temporal understanding of power consumption. In addition, we will promote the integrated visualization of overall power consumption on campus and the institution's carbon footprint\*1, along with leveraging energy data from power grids as it examines how to further leverage renewable energies. An example would be to optimize power consumption across campus facilities/equipment through workload shifting\*2. Considering the power consumption issues it faces and the HPC\*3 cloud infrastructure and various experimental facilities it has on campus, the University of Tokyo is the ideal location for a watt-bit collaboration experiment.

With the rapid increase in power consumption stemming from data centers, etc., and the increased use of distributed power sources, such as renewable energies, TEPCO PG must take grid management into the next generation and find new ways to address these issues with customer participation rather than merely building more facilities, as has been done conventionally. Through this initiative we will examine how to shift workloads over wide areas and between regions to handle inter-university computing processes and leverage digital twins on campus for cross-sectional visualization, as we aim to develop

next-generation transmission and distribution services that are linked to privately owned facilities, including distributed power sources (watt) and computing facilities (bit).

We hope that this collaboration between industry and academia will help to develop inter-regional university collaboration through watt-bit and we will continue to fulfill our mission of providing a stable supply of power by implementing a watt-bit optimization model.

\*1: Carbon footprint

Refers to the conversion into CO<sub>2</sub> of the amount of greenhouse causing gasses emitted over the lifetime of an appliance or service from the procurement of raw materials to manufacturing, transportation, use, and disposal.

\*2: Workload Shifting

Method for optimizing the management/control of computer processing (jobs and services) by actively moving them between data centers, clouds, and edges, and to different time frames, in accordance with conditions such as delays, cost, electric power (renewable energies) and failure risk, etc..

\*3: High Performance Computing

Technologies and systems for the ultra-high-speed processing/computing of large volumes of complex data, using computers connected to a network of multiple servers.

[Reference information]

The University of Tokyo Center for Strategic Promotion of GX official website (Japanese only)

<https://gx.u-tokyo.ac.jp/>

<Attachment>

Watt-Bit Collaboration Project for Green Transformation

End of announcement

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## Watt-Bit Collaboration Project for Green Transformation

<Green Transformation (GX) initiatives at The University of Tokyo>

Beginning with “Alliance for Global Sustainability” in 1994, The University of Tokyo has continuously engaged in GX initiatives. In 2008, it began “UTokyo Sustainable Campus Project” as an initiative to promote GX on campus and has positioned GX as one of the action plans of “UTokyo Compass” Action plan announced on September 30, 2021, which is a basic policy of the university. Since April 2025, the university has focused on carbon neutrality, nature positive, and circular economy initiatives, and has gathered a diverse range of expertise while coordinating with stakeholders both within and outside of the institution to transform social economic systems into regenerative systems in an effort to find solutions and put them into practice. At the same time, it has also established a Center for Strategic Promotion of GX to take the lead in promoting GX strategies throughout the entire university. The Center is currently implementing various policies and finding solutions under the guidance of Center Director Tatsuya Okubo.

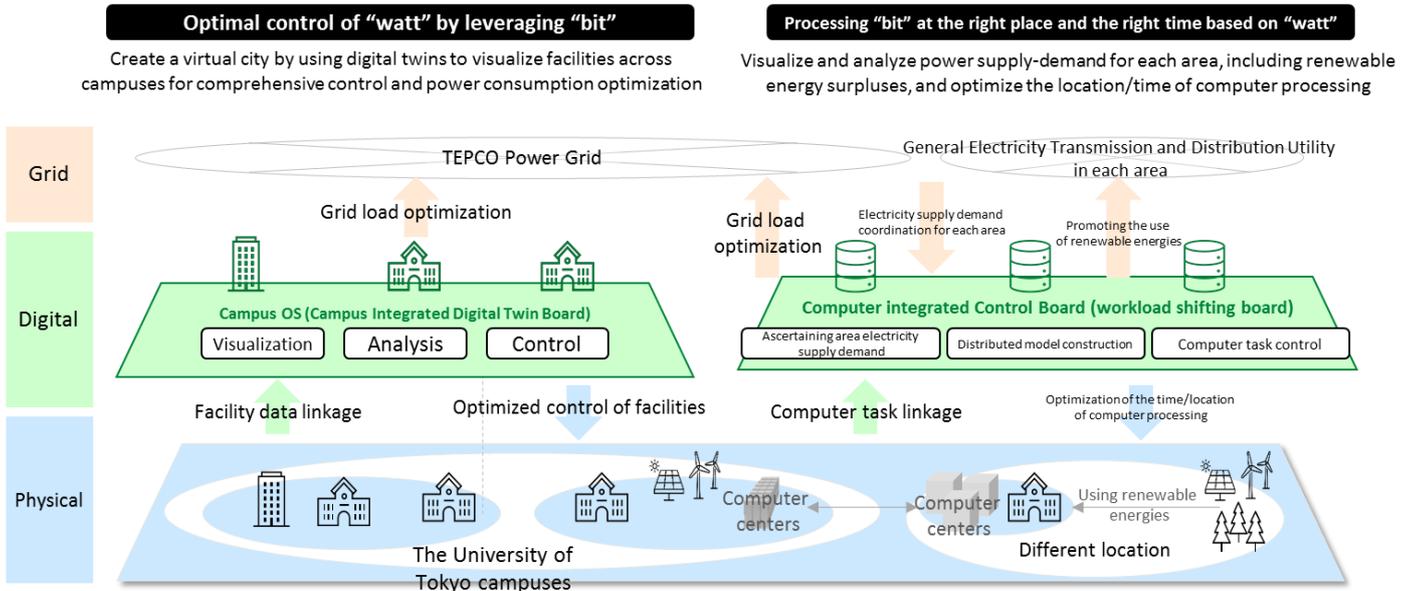
<Watt-bit collaboration>

The electricity demand for data centers is rapidly increasing in conjunction with the promotion of the use of AI and an increase in communications traffic, and the building of such infrastructure is an extremely important policy issue for Japan. As defined in the Japanese Government’s GX2040 Vision (approved by the Cabinet in February 2025), the social implementation of “watt-bit collaboration” by which power (watts) and communications (bits) are effectively unified is extremely important for efficiently building next-generation power/communications infrastructure.

< The University of Tokyo Center for Strategic Promotion of GX “Watt-Bit Collaboration Project”>

With the cooperation of various partners, the University of Tokyo will engage in this

project for the social implementation of watt-bit collaboration by treating The University of Tokyo’s campus as a “city” to achieve the ultimate goal of GX. The aim of the project is to be the first in the world to create a watt-bit optimization model and various players will collaborate and coordinate on the topics of: ① Optimal control of “watt” by leveraging “bit”; and ② Processing “bit” at the right place and the right time based on “watt”.



<Overview of project initiatives>

There are times when there is no other option but to restrict the output of renewable energies such as solar power, etc. for which power output fluctuates based on the time of day and the regional distribution of power stations is uneven, because they cannot be connected to the grid due to location or time-related factors. At the same time, the electric power required for computing at data centers, etc., continues to increase. During FY2025, the Hongo Campus of The University of Tokyo will be used as a test field for the following two initiatives as we aim for the social implementation of advanced watt-bit collaboration.

① Optimal control of “watt” by leveraging “bit”

By treating the University of Tokyo as a city we aim to construct a model for optimizing electric power consumption (watts) throughout an entire region or city by using a digital twin to cross-sectionally visualize (leveraging bits) the behavior and operational status of facilities on the entire campus in real time.

This project will become a model case for promoting facility operational control and behavioral changes and more effectively and efficiently using power in a way that fits the electricity supply demand situation throughout the entire region and on campus.

② Processing “bit” at the right place and the right time based on “watt”

By visualizing and analyzing the national electricity supply demand situation (watt), including renewable energies, we aim to construct a model for controlling the location and timing of computer processing (bit) needed for computing in accordance with electricity demand.

Realizing this model will expand the possibilities for the maximum utilization of existing power grid facilities thereby enabling the quick construction and large-scale expansion of new data centers and contributing to data center power issue solutions.

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