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School of Engineering, The University of Tokyo

Kandenko Co., Ltd.

Kyudenko Corporation

SHINRYO CORPORATION

Taikisha Ltd.

Dai-Dan Co., Ltd.

Takasago Thermal Engineering Co., Ltd.

Tokyo Electric Power Company Holdings, Inc.

Tonets Corporation

Mitsubishi Heavy Industries Thermal Systems, Ltd.

Establishment of a Social Corporation Program for Smart Building Systems by the University of Tokyo and Nine Private Business Entities

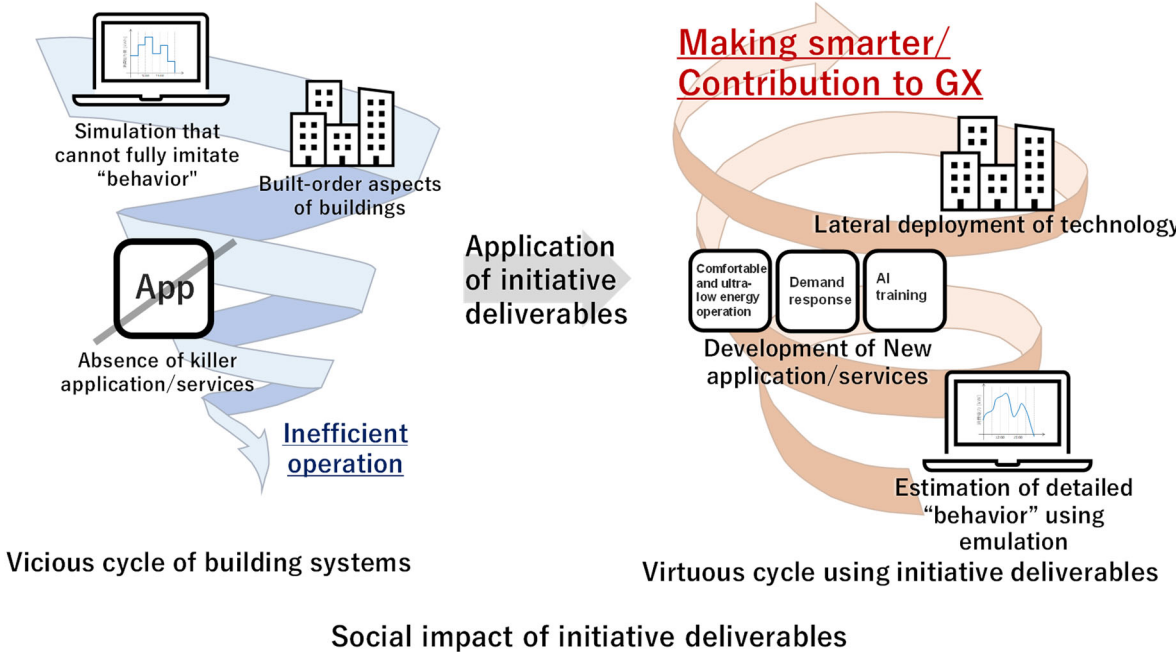
The School of Engineering of the University of Tokyo, in collaboration with Kandenko Co., Ltd., Kyudenko Corporation, SHINRYO CORPORATION, Taikisha Ltd., Dai-Dan Co., Ltd., Takasago Thermal Engineering Co., Ltd., Tokyo Electric Power Company Holdings, Inc., Tonets Corporation, and Mitsubishi Heavy Industries Thermal Systems, Ltd., will jointly launch the “Smart Building System Research Initiative” on November 1, 2023. This research initiative aims to expedite the realization of green transformation (GX) by fostering collaborative research on Smart Building Systems, ultimately aiming for building services technology to contribute toward achieving GX, including carbon neutrality. Additionally, by promoting the advancement of academic fields and nurturing talent in smart building systems, we aim to enhance and deepen engineering capabilities in the field of building services.

Annual energy consumption during the operational phase of buildings constitutes approximately 30–40% of total societal energy consumption, with a significant portion of energy usage in commercial buildings attributed to building systems, particularly air conditioning. At the same time, building systems can play a crucial role in energy conservation by optimizing their operation, harnessing renewable energy sources for

greater self-sufficiency, and contributing to grid stability through demand response mechanisms. Building systems play a pivotal role in addressing the pressing societal challenge of GX. Moreover, making building systems smarter is necessary for the effective realization of GX.

To achieve GX, continuous monitoring of indoor conditions and equipment status using high-resolution sensors, coupled with comprehensive emulation (digital twin cyber system) synchronized with real-world conditions, is vital. These efforts are essential for offering innovative services and proposing value, such as creating comfortable human-centric environments, reducing CO₂ emissions and costs, and influencing behavior change. Traditional building systems, often implemented as isolated products lacking detailed emulation, have hindered holistic studies for value creation. However, through the emulation capabilities developed in this initiative, we can facilitate the creation of diverse services and algorithms and generate training data for AI, thereby accelerating the transition to smarter buildings while also serving as a catalyst for establishing new businesses that drive societal transformation.

Through the initiatives undertaken, we will work towards enhancing the value of smart building systems that cater to diverse needs and explore new markets. Moreover, we are committed to constructing and institutionalizing an innovative academic framework for smart building systems, providing a solid foundation to support the ongoing development and deployment of highly skilled professionals in building and managing smart building systems.



Overview of the initiative

Name: Smart Building System Research Initiative

Duration: November 1, 2023~March 31, 2028

Representative instructor: Yasunori Akashi (Professor, Department of Architecture, School of Engineering, The University of Tokyo)

Comments from the Participating Corporations

Kandenko Co., Ltd.

Guided by Kandenko's founding philosophy, which states that "our own existence signifies the aim for coexistence with customers and local communities," we have consistently delivered comprehensive engineering services encompassing planning, design, construction, and maintenance. Our expertise extends to projects involving building services, electrical work, information and communication infrastructure, and more. By actively participating in this initiative, we are dedicated to advancing smart building systems, focusing on cutting-edge sensing technologies, etc. for indoor environments and equipment operation.

Kyudenko Corporation

As a comprehensive building services contractor dedicated to providing extensive support for daily life, we are actively pursuing sustainability management with a strong commitment to addressing various societal challenges through our business operations. Through our engagement in this initiative, we will diligently advance and enhance the relevant technologies. Our goal is to implement intelligent building systems that can adapt to evolving societal conditions, ultimately working towards carbon neutrality targets.

SHINRYO CORPORATION

We believe that driving GX through the strategic utilization of digital technology in building services is paramount to achieving a carbon-neutral society. The smart building systems at the core of this initiative are expected to solve social issues by harnessing technology that simultaneously fosters novel value creation and decarbonization. SHINRYO CORPORATION remains steadfast in its commitment to advancing research and development towards the realization of a carbon-neutral society, particularly through industry-academia collaborations within this initiative.

Taikisha Ltd.

We firmly believe that addressing the pressing societal concern of GX necessitates focusing on smart building systems, particularly those with high energy consumption during the operational phase, such as air conditioning. Within the framework of this initiative, Taikisha is committed to actively contributing to the advancement of foundational technologies associated with smart building systems. We aim to facilitate the seamless implementation of these systems, including introducing previously unavailable services and generating new value.

Dai-Dan Co., Ltd.

Smart buildings, encompassing a wide variety of sensing technologies and sophisticated control systems, demand integration technology that facilitates seamless cooperation among different building equipment. Dai-Dan, operating as a comprehensive building services engineering contractor specializing in electrical, air conditioning, and sanitation work, will actively engage in this initiative. Our objective is to advance the intelligence of building systems, thereby making significant contributions to GX within the building services industry.

Takasago Thermal Engineering Co., Ltd.

Currently, commercial buildings are required to be carbon neutral and implement a human-centric environment. Takasago Thermal Engineering's mission is to provide "Total carbon neutral solutions" across the entire lifecycle of building equipment for the issues above. These solutions include the development of energy control technologies encompassing environmental management, renewable energy creation, and demand response integrated into the design, construction, and operation of building equipment. As an Environment-CreatorTM our participation in this initiative is driven by the goal of enhancing the overall value of buildings and actively contributing to the realization of GX, thereby leading to carbon neutrality in the global environment.

Tokyo Electric Power Company Holdings, Inc.

Given the global proliferation of renewable energy adoption, the adaptability of power control within buildings becomes crucial to ensure a reliable power supply. Notably, air conditioning system is expected to play an even more significant role in this context. The TEPCO Group, as an energy service provider, has undertaken numerous projects in this domain. Leveraging our extensive expertise, we are committed to actively contributing to the implementation of smart building systems and achieving GX objectives.

Tonets Corporation

Founded in 1937, Tonets is a well-established general engineering contractor specializing in the design, construction, and after-sales maintenance of air conditioning and sanitation systems. In this sector, technological advancement is crucial to achieve a sustainable global environment. We wholeheartedly endorse the importance of this initiative, which seeks to establish a shared framework for smart building systems through collaborative endeavors, as opposed to each entity independently developing its systems, as has been the practice in the past. We eagerly anticipate our role in contributing to the realization of digital twins.

Mitsubishi Heavy Industries Thermal Systems, Ltd.

As part of the Mitsubishi Heavy Industries Group, we are committed to enhancing the quality of life, particularly in the fields of “cooling and heating,” while concurrently advancing energy efficiency and decarbonization efforts. Within this initiative, our goal is to disseminate our vision for new markets and fundamental technologies across related industries. We are trying to contribute to the development of products that align with GX objectives by elevating the intelligence of building systems, particularly air conditioning, which accounts for most of the annual energy consumption in buildings.

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