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Autonomous Eco-Campus

Scale data and systems towards sustainable universities



SIEMENS

Bridging the Sustainability Gap in Higher Education Buildings

Universities are the place to learn, advance and build up capabilities to develop the world of tomorrow. A learning environment that contributes to a sustainable future society.

But let's face it: With tens of thousands of Higher Education Institutions worldwide and operating campuses with multiple buildings and adjacent infrastructure, **universities'-built environment does contribute to the world's greenhouse gas emissions.**

While **scope 1 emissions** - direct emissions like usage of fuel for boilers, turbines, process heat- are the smallest portion, **scope 2 emissions** - indirect, e.g. electricity consumption - and **scope 3 emissions** - travel and commuting of students, electronical equipment and consumption of resources as food, waste, water, internet - typically constitute the largest portion of a universities' carbon footprint. With above 70%, scope 2 and 3 emissions are the most difficult to quantify and manage.

Universities are placing emphasis on addressing emissions as part of their sustainability initiatives and to support broader climate action objectives. The strongest lever universities have is to optimize their **buildings and campus operations towards energy efficiency and carbon neutrality.**

However, today only **45% of universities with net-zero emission targets have published transition and strategic action plans**, indicating a significant **lack of execution capabilities.**

Key issues that limit the impact of net-zero activities in reducing the carbon footprint on campus

Data fragmentation

Siloed university management systems, such as enterprise resource planning and student information systems separate from campus infrastructure management systems like building management, energy management, security, safety, maintenance and space management impede the development of a unified sustainability view and strategy.

Limited collaboration

Disconnected software, IT systems and data platforms hinder interdisciplinary and cross-department cooperation and comprehensive resource management.

Student engagement

Fragmented experiences and lack of awareness hinder student participation in the universities' sustainability initiatives.

Rising expectations:

Universities are faced with students' and stakeholders' increasingly ambitious CO2 reduction demand, demonstrating the individual commitment to sustainable practices.

Let's explore solutions to integrate data systems, foster cross-university collaboration, invest in the right technology, and create awareness among students regarding the urgency of a sustainable campus.



What are we looking for?

The challenge is to design a **scalable digital solution** leveraging the Siemens [Building X](#) framework, seamlessly integrated with university operation systems to enhance efficiency and connectivity.

The goal is to build an autonomous and sustainable campus through your idea, that connects various data, systems through e.g. software pieces, algorithms or digital solutions build on open APIs.

Considering university processes and systems e.g. curriculum planning, recruitment, enrollment, learning, research, the challenge is to combine relevant data and systems with building and campus infrastructure management to drive sustainability, optimize resource use, and support universities in achieving their environmental targets.

We need to break down silos and foster collaboration to reduce the carbon footprint and achieve universities' sustainability targets.

What if we can increase **energy efficiency** by knowing more about the favorite daily routine of students?

What if students can **positively impact** the university's sustainability targets **with their own behavior**?

Siemens is looking for a solution that is **creating value for the needs of universities** and which is **globally scalable**.

Only then, we can leverage our global networks and together with our higher education clients and partners create **major impact towards net-zero!**

We aim towards an **autonomous campus sustainability ecosystem** for Higher Education Institutions – addressing **campus infrastructure, research, teaching, and resource usage**. Concurrently, the solution should encourage **sustainable behaviors**, strengthen university brands, and ultimately attract students while enhancing their **learning experiences**. In the end, supporting research toward net zero enhances your university's reputation and makes it a more attractive institution for future students.

Aspects, requirements and considerations

- ❖ **Integrate data** and systems
 - Eliminate data silos to present a comprehensive view of campus sustainability status, measures, and impact plans
 - Integrate ERP, student information, and campus infrastructure management systems into a unified, AI-powered platform
- ❖ Utilize [Siemens BuildingX framework](#) to establish a centralized data hub
- ❖ **Autonomize campus** management
 - Utilize real-time monitoring and predictive analytics for on-campus sustainability measures
 - Automate building operations to enhance energy efficiency, occupant comfort, and overall sustainability
- ❖ Enhance **student experience**
 - Develop interactive applications that engage students in university sustainability efforts
 - Integrate sustainability data into teaching and research, enabling students to analyze real-world campus data for projects and assignments
- ❖ **Cross-domain sustainability** initiatives
 - Promote interdisciplinary collaboration by eliminating barriers between academic departments and operational units
- ❖ **Use and integrate AI and machine learning** to identify patterns and opportunities for sustainable practices across various campus domains

Integration Environment

- ❖ IoT sensors and data analytics platforms can integrate information from various campus systems, including universities ERP, student Information systems, and campus infrastructure management systems. This enables real time monitoring and data-based decision.
- ❖ Intelligent building and room management systems can optimize energy consumption and improve campus sustainability.
- ❖ User-friendly mobile applications and platforms can enhance student engagement and campus operations.
- ❖ AI and machine learning can provide valuable insights and automate processes considering all relevant systems on campus.

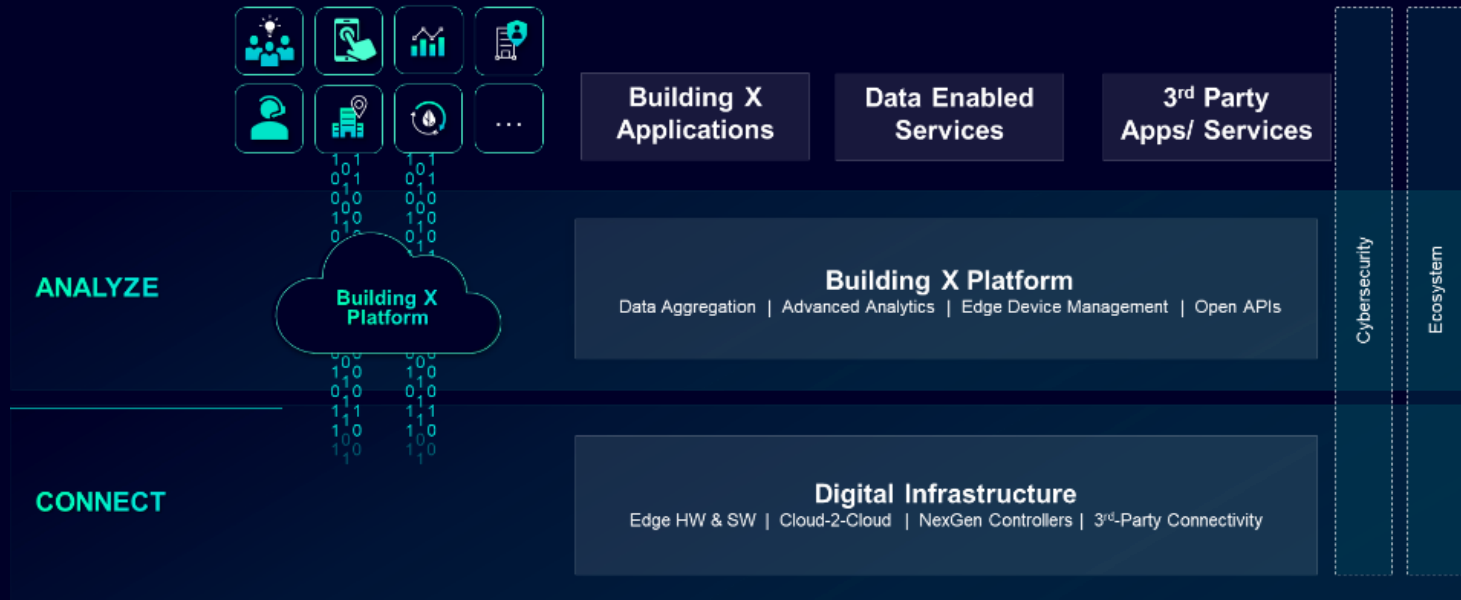
To optimize sustainability for university campuses, Siemens is providing leading [Building Technology](#) , including **building automation systems and building IoT platforms** with [Building X](#) as well as adjacent necessary hardware and software.

On top of this, **relevant services to optimize sustainability measures e.g. [optimizing HVAC consumption](#)** .

Which Siemens software/ Siemens products will be used

The approach and framework of Siemens [Building X](#) should be the core when developing the idea.

As Siemens puts openness and interoperability in the core of its development, several APIs across the Siemens ecosystem are provided:



- <https://developer.siemens.com/building-x-openness/overview.html>
- <https://developer.siemens.com/apis.html>
- <https://xcelerator.siemens.com/global/en/api-world.html>
- <https://developer.siemens.com/index.html>
- <https://developer.siemens.com/sigreen/overview.html>

What does Siemens do to support?

- ❖ Siemens has global relations and a network with Higher Education Institutions and is a thought leader for sustainability measures and implementations, with solutions, resources and dedicated partners.
- ❖ Siemens is aiming for solutions that enable easy and future proof deployments at single campuses as well as scalable implementation at university campuses across the globe.
- ❖ Siemens will support with product experts around [Building X](#) as well as innovation managers from sustainability departments.
- ❖ We provide insights into sustainability solutions or AI topics related to building and infrastructure management systems and [Building X](#).

Subject matter experts from the global Siemens Higher Education team are the main sparring partners in this challenge.

An overview on Siemens' approach towards Higher Education is provided on our [Siemens Xcelerator Marketplace for Higher Education \(link\)](#).

We will challenge your ideas and help you develop them further; we support when roadblocks occur; we leverage the global Siemens network and have access to knowledge and expertise pools.

What is your impact?

- ❖ Your successful participation in this challenge will contribute to global sustainability goals for Higher Education Institutions.
- ❖ Your solution will revolutionize higher education institutions by creating more engaging learning environments, positioning universities as sustainability leaders, and optimizing campus operations through data-driven decision-making and resource efficiency.
- ❖ Moreover, your involvement will foster sustainability-conscious behaviors, contribute to global climate change mitigation efforts, and create intelligent campuses that benefit both the academic community and the environment while reducing operational costs.
- ❖ For Siemens, this collaboration will showcase our campus digital solutions, increase adoption of building IoT platforms like Building X, and advance smart building technologies, ultimately leading to more autonomous, people-centric sustainable campuses.

Who are we?

- ❖ By focusing on breaking the silos of operation systems and tools, and enhancing sustainability at university campuses, we aim to leap into the future with an end-to-end sustainability approach for HEIs.
- ❖ We put the value for Higher Education Institutions at the center of everything we do.
- ❖ Our team is passionate about combining strength for the better.
- ❖ Our international team includes solution experts, strategy & method designers, building management software developers and sustainability innovators



Till Krumbholz
Solution Director
Higher Education



Mete Tanrikulu
Strategy Project
Manager
Higher Education



Jonas Fluri
Product Management,
Portfolio & Innovation
Head



Michał Sieńczak
Developer Advocate
for Building X



**Silke Röntgen-
Zimmermann**
Communication
Manager Higher
Education

We are excited to collaborate with YOU in shaping the future of autonomous sustainable campuses!

<https://siemens.com/techforsustainability>



Siemens Tech for Sustainability Campaign 2025



Tech for Sustainability is a global initiative for students, researchers, startups, and innovative individuals to leverage technology to solve real-world sustainability challenges and shape our future alongside Siemens.

Leverage technology to shape a sustainable future

Siemens AG is a technology powerhouse that brings together the digital and real worlds to benefit customers and society and thus people around the globe. The company - having shaped each of the four industrial revolutions - focuses on intelligent infrastructure for buildings and decentralized energy systems, on automation and digitalization in the process and manufacturing industries, on cybersecurity, and on smart mobility solutions for rail transport, but also in financial services and software development. As a global ideation campaign, Tech for Sustainability is designed to engage innovators outside of Siemens in order to come up with unique solutions for problems with a focus on sustainability. In a hackathon, the innovators who have been particularly successful in the early stages of the Campaign will have the opportunity to create a proof-of-concept and proof-of-feasibility for their ideas.

“Sustainability is in our very DNA. It is not an option. It is a business imperative.”

Judith Wiese, Chief People and Sustainability Officer, Member of the Managing Board of Siemens AG



What's in for you?



Win Prizes

EUR 30,000 total kick-start investments



Multiply impact in real world challenges

Solve real problems together for a sustainable future



Pitch in front of top management

Show your solution to Siemens Management



Follow-up in joint projects

Together, we make a lasting impact

How do you get to the next phase?

- Innovativeness: Incremental or disruptive innovation
- Sustainability: DEGREE and impact on the UN Sustainability Development Goals
- Feasibility: Degree of technical and/or economic feasibility
- Potential: Fit to Siemens processes, products and markets
- Implementation: General implementation efforts (Time to market, R&D costs, etc.)

Join the campaign and create impact on real problems together with go-getters and solution seekers of the world by submitting your ideas.

<https://siemens.com/techforsustainability>

Feel free to contact us if you have any questions!

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