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# ENERGY IN BUILDINGS

## EMEA 2024

Europe, the Middle East & Africa

FRIDAY - SATURDAY

NOVEMBER 22-23, 2024

@ 9:00-18:00

### SESSIONS:

- SUSTAINABILITY
- HEALTH & SAFETY
- DECARBONIZATION
- TECHNICAL SOLUTIONS
- DIGITAL ENVIRONMENT
- POLICIES & LEGISLATION
- ENERGY EFFICIENCY FIRST
- RESILIENCE TO CLIMATE CRISIS

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**Chari Toloumis**

**Siemens S.A.**

Head of Business Unit Buildings

E-mail: [charilaos.toloumis@siemens.com](mailto:charilaos.toloumis@siemens.com)

# Future of Buildings

# Future of Buildings

Your guide to a better understanding of the difference technology can make



## Current megatrends

Global trends  
are changing  
our markets –  
structurally  
and profoundly



#ClimateChange

#Digitalization

#Glocalization

#DemographicChange

#Urbanization

#ResourceScarcity

The future  
brings with it some  
acute challenges

## People Challenges



# 9.7bn

people will populate  
our planet by 2050.<sup>1</sup>

# 90%

of lifetime spent in buildings.<sup>1</sup>

# 68%

of the world population projected  
to live in urban areas by 2050.<sup>2</sup>

Sources: <sup>1</sup> United Nations <sup>2</sup> Alliance To Save Energy (ASE)

The impact of buildings  
on the energy transition  
is huge

## Environmental Challenges



**40%**

of all energy is used by buildings<sup>1</sup> whose operation causes 27% of global CO<sub>2</sub> emissions.<sup>2</sup>

**75%**

of all buildings are energy inefficient.<sup>1</sup>

**2x**

the global building floor area by 2060.<sup>2</sup>

**More**

cooling than heating by 2050.

Sources:

<sup>1</sup> Alliance To Save Energy (ASE), EU, UNEP, EPA

<sup>2</sup> architecture 2030



## Sustainability Challenges



- **Sustainability goals and regulations** need to be met
- Stricter policies from the **Paris Agreement**
- Greater **pressure for action** with high potential in the construction industry as demand of products can decline and CO<sub>2</sub> emission costs may rise
- Businesses can only be **competitive when sustainable**

# Let's focus on the floor area in commercial buildings

# When it comes to commercial buildings, there is a wide range of building types

**Smart services** for energy efficiency, e.g., fault detection, optimization

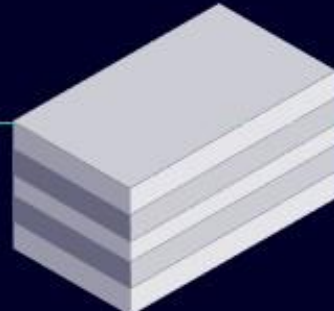
Usually none

Often omitted due to cost

**Automated HVAC system** with room-by-room regulation

Often omitted due to cost

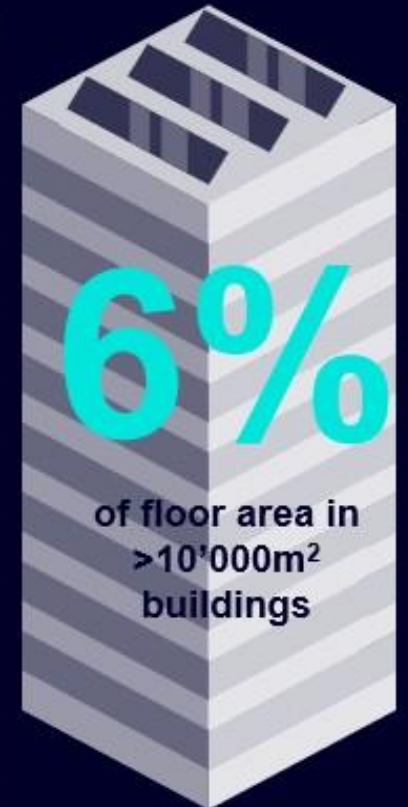
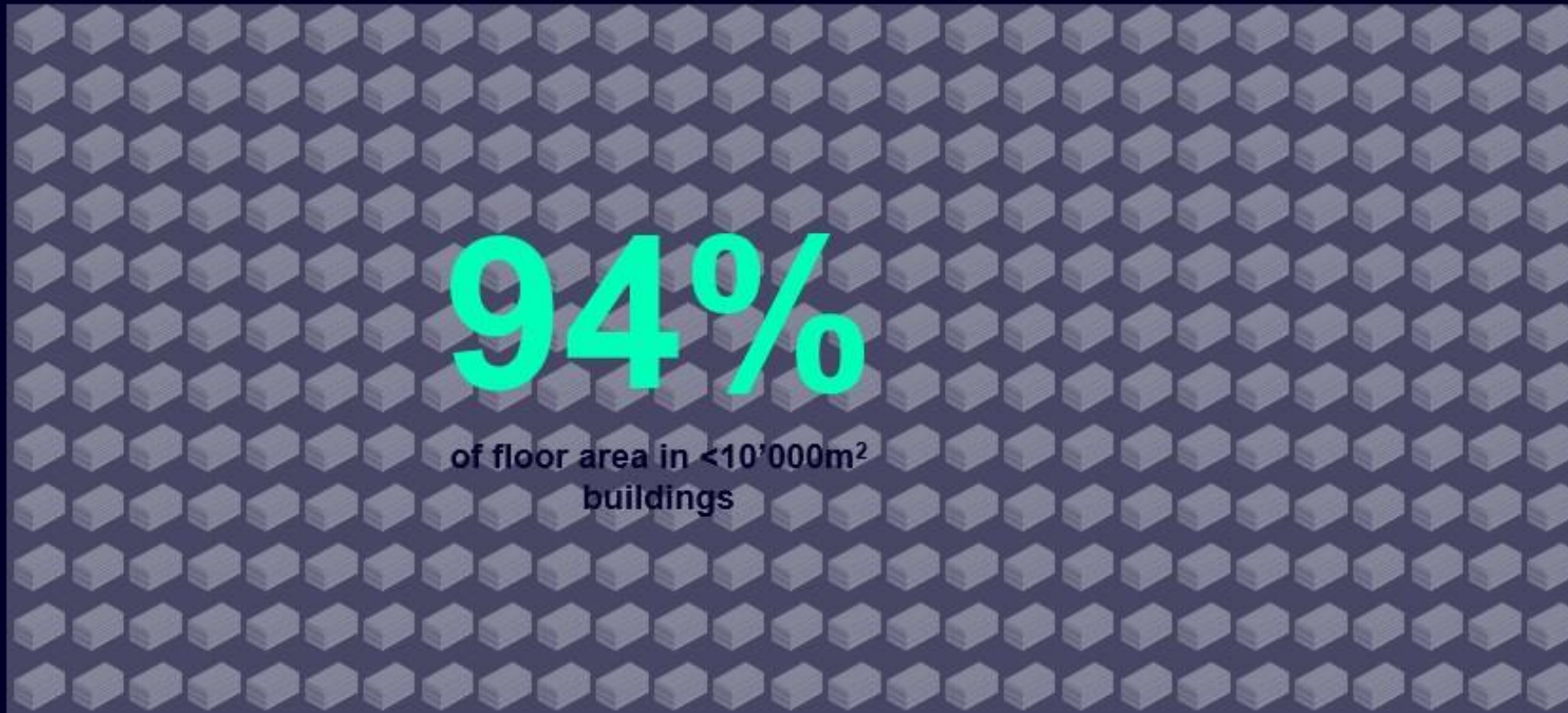
Mostly integrated



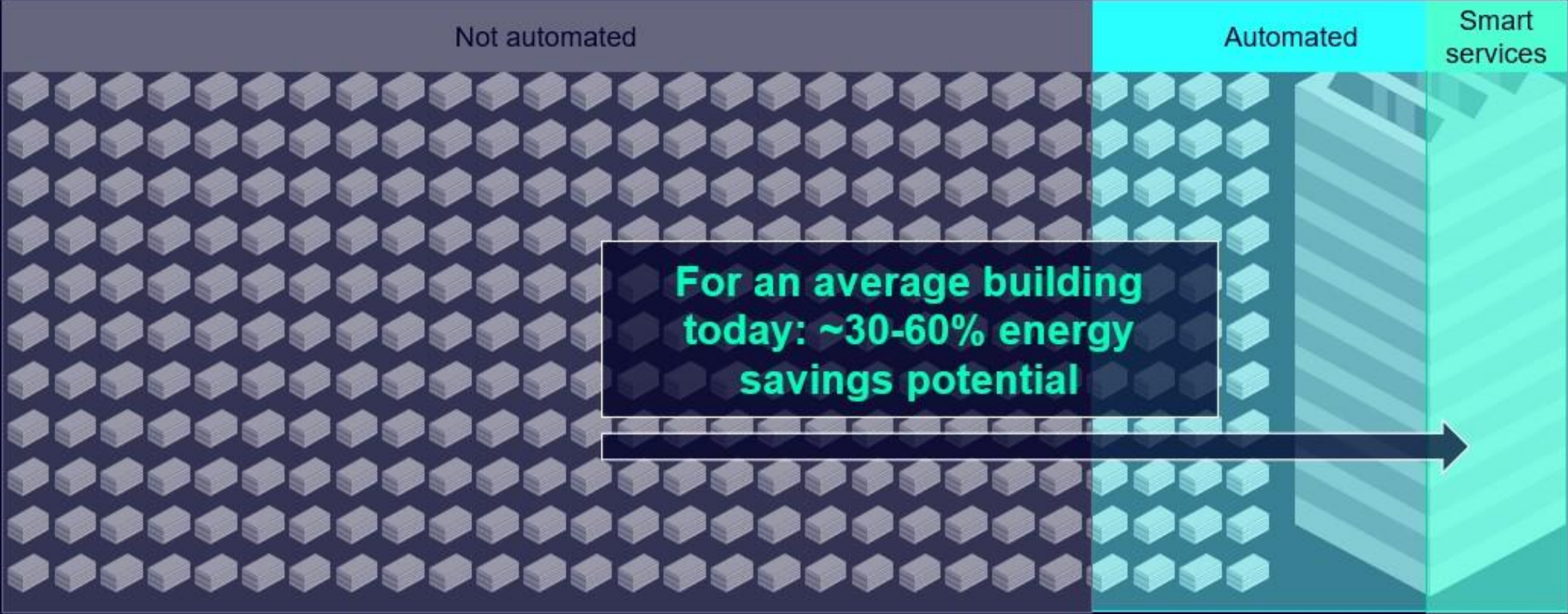
**Small buildings**  
< 10'000 m<sup>2</sup>

**Large buildings**  
> 10'000 m<sup>2</sup>

## The global stock of commercial buildings – vast majority of buildings is smaller than 10'000m<sup>2</sup>



# Most buildings are not automated and have big energy savings potential



## Key takeaways



### Regulation – compliance and certification

- Increasing pressure on companies to be compliant
- Stronger regulation at a global, regional and country level
- Expectations on sustainability from tenants and employees grows



### Retrofit wave for existing buildings

- 75% of all current buildings are inefficient
- We need to expand the application of automation in new, and existing buildings
- Fast and simple retrofit to add automation is a key enabler



### Broader engagement required in industry and beyond

- Retrofit wave broadens the scope of buildings to equip
- Mobilization of an expanded workforce to deliver automation is crucial
- Solutions that require less experience and skills for simpler buildings are core

Technology alone won't do the trick, but  
**75% of companies  
see digitalization  
as key driver**  
of change processes in buildings<sup>1</sup>

<sup>1</sup> ZIA-CREM-Study 2020

# Technology can make a difference Especially in buildings



## Sustainability & Energy Saving

- Reduce energy consumption through energy analytics and decrease CO<sub>2</sub> emissions
- Provide sustainability reporting



## Performance of Building Assets & Efficient Operations

- Enable easy engineering, installation & commissioning
- Optimize performance and maintenance
- Enable remote service



## People Health, Comfort & Safety

- Ensure physical safety & security of people
- Improve indoor air quality, provide thermal comfort and increase productivity



# Key technologies that enable the sustainable smart building

## Information technology (IT)

Common term for the entire spectrum of technologies for information processing, including software, hardware, communications technologies and related services. In general, IT does not include embedded technologies that do not generate data for enterprise use.\*

+

## Operational technology (OT)

Hardware and software that detects or causes a change, through the direct monitoring and/or control of industrial equipment, assets, processes and events.\*

convergence



## IoT

Equip devices and equipment with IP-communication and smart capabilities



## Edge

Deploy advanced software services, such as AI/ML, right at the source of the data



## Cloud

Collect and analyze large amounts of data in remote computing infrastructure



## Digital Twin

Making BIM based design and construction data available for building operations and maintenance

# Cloud, Edge and IoT provide a ~30-60% energy savings potential on average buildings today

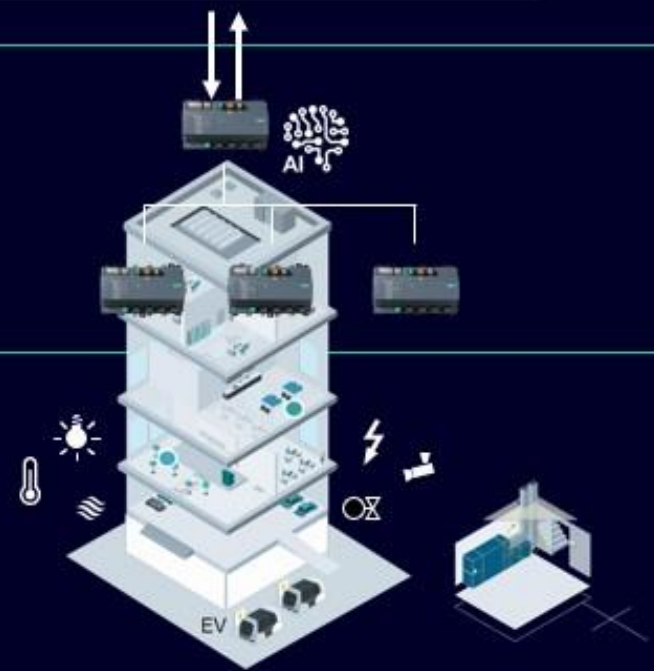
## Cloud

Data from multiple buildings is collected and analyzed at scale to derive insights into the building performance and optimize it.



## Edge

The building automation system is on the Edge, i.e., on-premises but connected to the internet, able and runs smart services on-premise, at the data source.



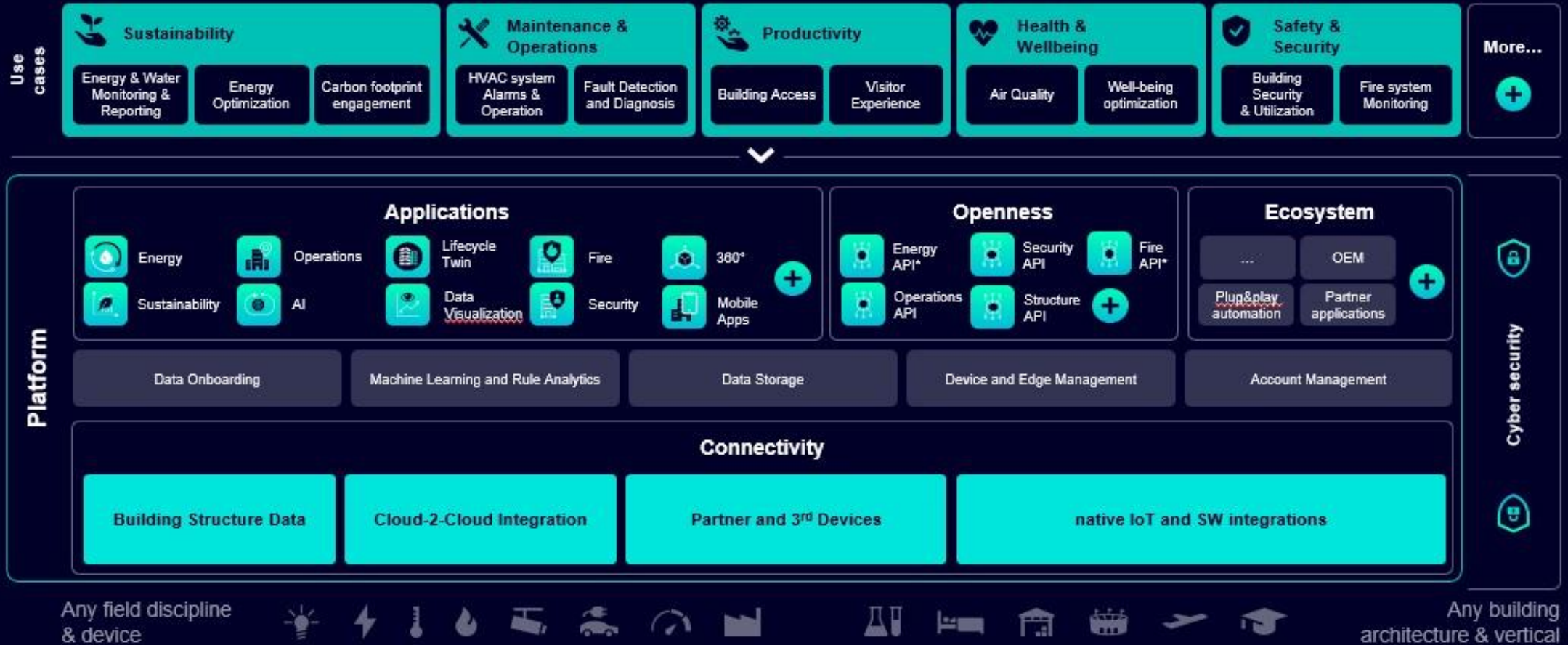
## IoT

Devices and equipment in buildings come with smart functions and communicate via IP-based protocols.



# Platform Strategy

A digital platform that digitalizes, manages, and optimizes building operations.



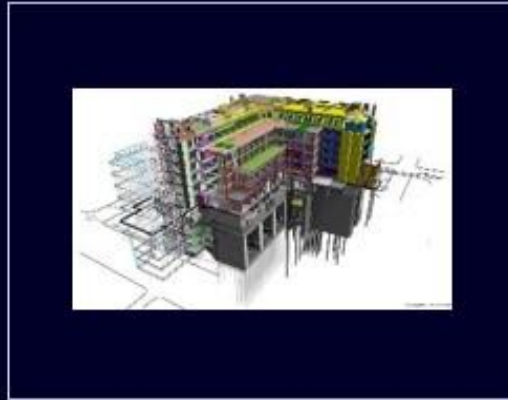
# Digital Twin

Efficient building operations through digitalization



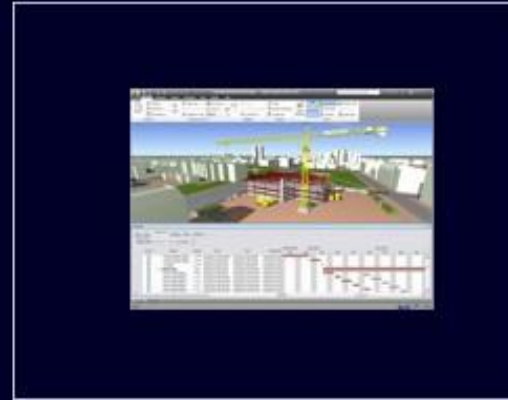
**2000**

2D Plans



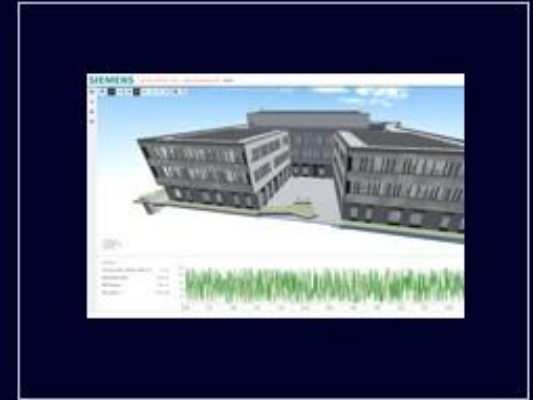
**2010**

Just 3D Models –  
Architects



**2015**

3D and Information –  
Construction Companies



**2023+**

**Digital Twin for building  
operation –**  
Owner and Operators

## Core concepts enabling the creation of digital twins in buildings



Common Data  
Environment (CDE)



Data Integration  
Platform



Lifecycle  
Twin

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