



Transforming properties into Smart Buildings

CBRE

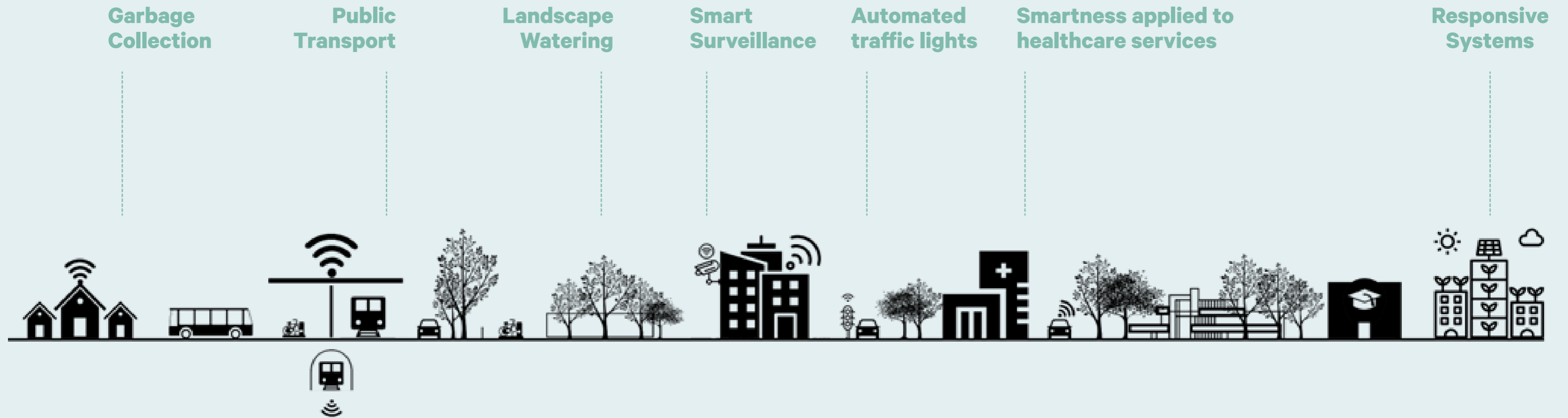
The Future

is Smart.
is Smart.
is Smart.



Smartness

Smartness in the Built Environment





Smart building, also known as intelligent building, is a structure that uses advanced technology to improve energy efficiency, enhance occupant comfort and safety, and reduce operating costs. These buildings incorporate sensors, meters, and other devices that collect data on various aspects of the building's performance, including temperature, humidity, lighting, occupancy, and many others that may and should vary according to each building and each goal. It's the art of transforming a building into a responsive and adaptative living machine.



The data collected is then analyzed and used to optimize the building's systems, such as heating, ventilation, and air conditioning (HVAC), lighting, security... For example, if sensors detect that a room is unoccupied, the HVAC system can adjust the temperature to save energy. Similarly, lighting can be automatically turned off when a room is empty.



Smart buildings can also be connected to the world through the internet of things (IoT), allowing for remote monitoring and control. Building managers can access real-time data on the building's performance from anywhere, using a computer or mobile device. This allows them to quickly identify and address any issues, such as equipment failures or energy inefficiencies.

What is a smart building?

Overall, smart buildings offer many benefits, including improved energy efficiency, lower operating costs, enhanced occupant comfort and safety, and greater control for building managers. As technology continues to evolve, we can expect to see even more advanced and sophisticated smart building systems in the future. And as sustainability is the hot topic of this decade, smart buildings are also known for its efficiency and sustainability, being completely focused on saving resources and transferring them from less needed aspects to more needed ones.

One Platform, All Together!

All the subjects and disciplines that are somehow measurable and adaptable – lighting, HVAC, security, fire safety, power, comfort, 3rd party partnerships, occupancy, among others – must be connected to one single integrate platform that allows the parameterization and the use by all occupiers, visitors, managers and technicians.

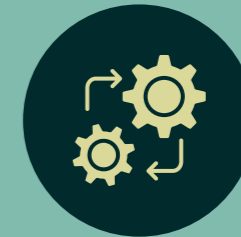
Scalable
Solutions



Secured
Connectivity



Simple
Integration



5S'
plan

Sustainability
Oriented



Smart
Engineering



“A smart building is one that delivers outstanding outcomes for all users, through digital technology, to exceed their evolving expectations.”



The image shows a modern building interior with a large green graphic element on the left side. The graphic is a thick, curved line that starts at the top left, curves down and to the right, and then continues as a horizontal bar at the bottom left. The background is a photograph of a building interior with a glass and metal structure. The text "Enhanced Value through Smart Transformation" is overlaid in white serif font on the right side of the image.

Enhanced Value
through Smart
Transformation

A Smart Building helps provide a perfect place to live, to work or to have fun!

User-Centric

- Personalized spaces experience
- Innovation, creativity and retention
- Adaptive environment contributing to health and well-being
- Creating communities by connecting people and spaces
- Safe and secure spaces





Flexible

- Flexibility – future proofing
- Space efficiency with new ways of live, work and play
- Real estate asset efficiency
- Adaptative solutions

Sustainable

- Minimized environmental impact
- Optimized resource and energy efficiency
- Improved financial performance with a sustainable design
- Building asset performance

Exploring the interface of Smart Buildings: an examination of potential daily interactions enabled by advanced technological implementations

-  Actions conducted or that affect **Users**
-  Actions conducted or that affect **Building**
-  Actions conducted or that affect **Settings**
-  Actions conducted or that affect **Services**

Arrive at the building

The fastest way to get to the building is calculated and a GPS notification appears on your phone.

Parking

Book parking spaces in advance through the app. Access granted through license plate recognition.

Charge it Up

Charge your electrical vehicle according to your calendar to avoid peak hours. Your phone gets a notification when the car is fully charged.

Access

Seamless access through the building entrance using the app. Both for regular users and visitors.



USB



Notifications

Receive notifications on your cell phone about events, incidents and more related to your building or another you are visiting.

Find what you are looking for

Look for your team and colleagues, a service or a store and get directions to your location appears on your phone.

Low Battery





Your phone battery is dead. Charge it up simply by putting it down on a horizontal charging surface.

Alert

Report issues to the facilities management team through the app.

A day in an
Ultra
Smart
Building

Exploring the interface of Smart Buildings: an examination of potential daily interactions enabled by advanced technological implementations

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Lifts

Find out on your phone which elevator to take depending on where you want to go. Watch selected news on the touchless screen, according to your preferences.

Booking

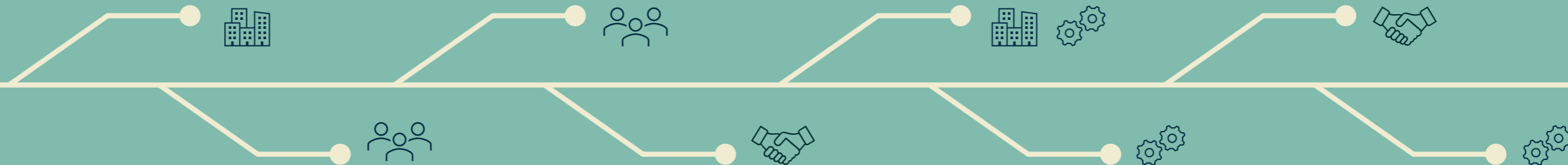
Book a desk to work, a room to sleep or a space to hold a meeting, on commercial or living buildings, based on your preferences, activities for the day and availability.

Settings

Machine learning enables personalized settings, such as lighting and temperature, depending on the user detected using the space at the time..

Services

3rd party integration such as restaurants, light mobility, gym classes.



Services Booking

Find services you need near you and book them instantly – integrated calendar system (car wash, beauty services, Pilates classes, massages, etc.).

App

A building App informs that there are free services available (washing machines in a co-living, a 3D printer in an office, a breastfeeding room in a shopping center, etc.).

Good Night

Facilities management team gets notification that all users have left the building. Lights and HVAC systems go into sleep mode.





Management Report

At the end of the day, a full report on the building's health, consumptions and energy savings is shared with the management team.

A day in an

**Ultra
Smart
Building**

Exploring the interface of Smart Buildings: an examination of potential daily interactions enabled by advanced technological implementations

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Empty Trash

Facilities management team and city garbage collector services get a notification. It's time to clean.

Chameleon Adaptability

Visual adaptability of some areas of the building through lighting and sound to promote the necessary environments for each occasion.

Empty Consumables

Facilities management team get a notification that some consumables – hands soap, toilet paper, coffee capsules, water fountain... - are running out the time.

Settings

Machine learning enables personalized settings to each occupier, such as light temperature, water temperature and pressure, overall unit temperature...

Deliveries

Occupiers may implement smart lockers for deliveries that won't need keys or meeting with the delivery person. 24/7 deliveries.

Occupier Report

On a weekly or monthly bases, the occupier gets its own report to understand where they can reduce energy consumptions to save money and resources.

A day in an

Ultra
Smart
Building



Focusing on Office Buildings



A modern office interior featuring a large, curved wooden structure that serves as a central workspace. Several people are seen interacting in the space, including a man and a woman sitting on a staircase to the left, and others standing on the upper levels. The ceiling is illuminated with recessed lights, and the overall atmosphere is bright and collaborative.

Relevance

The robust labor market significantly influences the return-to-office discussion, as employees, due to their comparatively strong position, can assert demands such as remote work. Office spaces are progressively used for gathering rather than simply day-to-day work. Therefore, as companies reassess the square footage they lease in the face of changing needs, office landlords must attract corporate tenants and the employees that populate them by providing appealing properties and spaces.

Many companies have a return-to-work statement, and their expectations are rising - firstly experimental areas how seamless and easy is the office to access and to use and secondly around performance areas, how well performing is the asset from a sustainability point of view all the way through a health and wellness perspective.

Relevance

The real estate market is increasingly seeing a trend towards investing in digitally advanced buildings. This is not only due to their superior performance and reduced maintenance costs, but also to their increased value, driven by high demand for technological sophistication.

In the commercial real estate sector, particularly offices, technologically advanced buildings have lower vacancy rates and, therefore, lead to higher rents. The demand for these buildings is driven by international companies' requirements for their global positioning. These companies strive to attract and retain talent while promoting sustainability and efficient resource use. Consequently, due to the current scarcity of certified buildings with these features, those that possess them exhibit high occupancy rates and overall increased value – both applied to rents or the building selling value.

Moreover, smart technologies enhance property quality and appeal, leading to improved returns. Features of smart buildings can increase a property's value and attractiveness, making it more desirable to potential buyers. Overall, implementing smartness in real estate can significantly boost profitability and return on investment.



Advantages of implementing a “Smart Office” and its relationship with productivity

Overall, implementing an office in a smart building can provide a range of benefits that can help improve the productivity, comfort, and overall experience of the occupiers, making it an excellent choice for businesses looking to create a modern, efficient, and innovative workspace.

Increased energy efficiency

Smart buildings are designed to use energy efficiently, with advanced heating, ventilation, and air conditioning (HVAC) systems, automated lighting controls, and other energy-saving technologies. This can help reduce energy costs and minimize the building's carbon footprint;

Improved occupant comfort

Smart buildings can adjust the temperature, lighting, and other environmental factors based on the preferences of the occupants, providing a more comfortable and personalized experience. This can help increase employee satisfaction and productivity;

Enhanced security

Smart buildings typically have advanced security features, such as biometric access control, video surveillance, and intrusion detection systems. This can help ensure the safety of the occupants and protect the company's assets;

Data-driven insights




Smart buildings are equipped with sensors and other monitoring devices that collect data on various aspects of the building's operations, such as energy usage, occupancy levels, and indoor air quality. This data can be used to identify areas for improvement and optimize building performance;

Improved communication and collaboration

Smart buildings can provide a range of communication and collaboration tools, such as video conferencing, digital signage, and interactive displays. This can help facilitate teamwork and improve communication among employees.

Environmental building features that impact a Real Estate transaction

(continental Europe)

	 Pay a Premium (if present)	 Seek a Discount (if absent)	 Reject Building (if absent)	Total Impact*
<ul style="list-style-type: none"> ■ Investors ■ Occupiers 				
Features that reduce energy consumption	35.5% 32.1%	42.4% 21.4%	10.5% 32.1%	88.4%
Smart technology that adjusts building operations to reduce environmental impact	55.0% 50.9%	22.5% 17.5%	2.5% 10.5%	80.0%

To ensure employees' interest in working in the office space, it is crucial for companies to prioritize sustainability, technology and wellness in the evaluation of their office spaces.

9,6%
LISBON CURRENT VACANCY
(for total stock of 4,6M sqm)

GRADE A

BUILDINGS

0,9%

Vacancy of total stock

NON-GRADE A

BUILDINGS

8,7%

Vacancy of total stock

“It’s important that we harness the potential and vast array of applications that technology can have to shape our future. It’s important that we make our industry more productive, our places and precincts more relevant and inclusive to our tenants and the public. This involves making our buildings more intelligent, softening the footprint on our environment and developing the capabilities that we’ll need in the future to thrive in a technological society.”

Phil Rowland from CBRE in his opening address at the Property Council of Australia’s first Technology Summit in Sydney



Case Studies

The Edge, Amsterdam

The Edge, a 40,000 square meter office building in Amsterdam, is considered one of the smartest buildings globally, leveraging IoT, AI, and big data to create a highly efficient workspace.

Developed by OVG Real Estate, the building's smart technology includes IoT sensors, a Building Management System (BMS), smart lighting and HVAC, advanced security systems, and AI and machine learning.

The building is energy efficient, with a 102% energy efficiency rating, and provides enhanced security and improved occupant comfort. Predictive maintenance helps reduce downtime and repair costs, and the building's features have attracted premium tenants, such as Deloitte, resulting in a high occupancy rate.

- 25%

Savings on maintenance costs (less than \$300,000/year)

- \$500k

The building's energy efficiency results in annual energy savings of approximately \$500,000 (By generating more energy than it consumes)

95%

Occupancy rate of over 95%

10-15%

Over market rates

7-10

Years of Payback Period



Case Studies

22 Bishopsgate, London

22 Bishopsgate, a 62-story commercial skyscraper in London developed by AXA IM Real Assets, is a prime example of a modern and sustainable building.

The building, which opened in 2020, incorporates advanced technologies such as IoT sensors, AI and machine learning, an integrated Building Management System (BMS), smart lighting and HVAC, and state-of-the-art security systems. These technologies have led to significant energy savings, enhanced security, improved occupant comfort, and predictive maintenance.

The case of 22 Bishopsgate demonstrates the financial and environmental benefits of smart technologies in commercial buildings. The building's success underlines the importance of strategic technology investment in creating sustainable, efficient, and desirable office spaces.

- 20%

Predictive maintenance have reduced maintenance costs circa \$1 million annually

- \$2M

The building's energy-efficient systems result in annual energy savings of approximately \$2 million

90%

Occupancy rate of over 90%

15 - 20%

Over market rates

10 - 12

Years of Payback Period



Certifications highly contribute to the buildings positioning in the real estate market.



SmartScore

The SmartScore certification plays a key role in repositioning real estate assets in the market. It is an assessment tool that evaluates the intelligence and efficiency of buildings based on parameters like energy consumption, water use, waste management, etc. Possessing a high SmartScore implies that the property is eco-friendly, energy-efficient, and technologically advanced, which are desirable features in the modern real estate market.

This certification not only boosts the property's market value but also attracts a broad range of potential buyers or tenants who prioritize sustainability and smart living. Therefore, the importance of SmartScore certifications in repositioning a real estate asset in the market cannot be overstated. It serves as a competitive edge, enhancing the appeal and value of the property.

How to certify?

The certifications such as LEED, BREEAM, EDGE, among others, that categorize properties based on their energy efficiency and wellness performance already demand elements we would consider "smart".

On the other hand, the European Union has established a directive known as the Smart Readiness Indicator to address this issue. This tool measures smartness levels in buildings, developed collaboratively with REHVA and implemented using public platforms. It is distributed through various agents like ALDREN; Smart Square; Smart Built 4 EU, etc.

Among certifications in this smartness domain, the standout is the SmartScore certification by WiredScore which has gained significant market traction. We will delve into this certification further in forthcoming slides. **WiredScore is a company built to defines and certifies digital connectivity and smart technology in homes and offices on a global scale.**



ALDREN Alliance for Deep RENovation in buildings

REHVA Federation of European Heating, Ventilation and Air Conditioning Associations

Smart Built4EU The European SmartBuilding Community



Edge





Fields of Impact



SmartScore by WiredScore

Best Practices Guide

1. ● User Functionality

2. ● Technological Foundations

3. ● Innovation

The SmartScore certification was created to recognize and promote technologically advanced smart buildings. It helps developers and owners create and market smart buildings that deliver exceptional user experiences, drive operational efficiency, meet high sustainability standards and are resilient in an ever-changing world.

For certification purposes, there are a series of criteria for evaluating the smartness of a building. These criteria are generally divided into areas, such as: User Functionality, Technological Foundation, Innovation, which we will detail below based on WiredScore's SmartScore certification Best Practice Guide, which includes detailed requirements and guidance for each criterion.

SmartScore Certification Levels



SmartScore
CERTIFIED

A SmartScore Certified building is a smart-ready asset with a solid foundation to build future smart functionality, such as a digitally-enabled core & shell building that has an established foundation for operational efficiencies. Alternatively, a SmartScore Certified building could be an older asset with some digital applications that make it stand out from the crowd.

Credits Required 45/100

Minimum Requirements

User Functionality

Functionality delivered across 3 categories

Technological Foundation

TF1:2 (Building Automation and control)



SmartScore
SILVER

A SmartScore Silver building is an advanced digitally-enabled building with an exceptional foundation to build future smart functionality. Alternatively, a SmartScore Silver building could be an older asset with many smart features to enhance the asset's capability to deliver a truly efficient, inspirational, sustainable and resilient building.

Credits Required 63/100

Minimum Requirements

User Functionality

Functionality delivered across 4 categories

Technological Foundation

TF1:1 (Building systems internet connection);

TF1:3 (Building systems integration)



SmartScore
GOLD

A SmartScore Gold building demonstrates a high level of innovation with an outstanding use of technology and processes to deliver excellent outcomes to the users and creating a truly efficient, inspirational, sustainable and resilient building.

Credits Required 77/100

Minimum Requirements

User Functionality

Functionality delivered across 5 categories

Technological Foundation

TF2:1 (Cybersecurity policy); TF2:4 (Data

privacy policy)



SmartScore
PLATINUM

A SmartScore Platinum building demonstrates cutting-edge innovation with the use of market leading technology, processes and automation to deliver world-class outcomes to all users of the building and creating the most efficient, inspirational, sustainable and resilient building.

Credits Required 90/100

Minimum Requirements

User Functionality

Functionality delivered across 6 categories

Technological Foundation

TF3:2 (Data aggregation and accessibility);

TF3:4 (Asset information model)



How can CBRE help?

How to transform a property into a Smart Building



Technical
Due Diligence

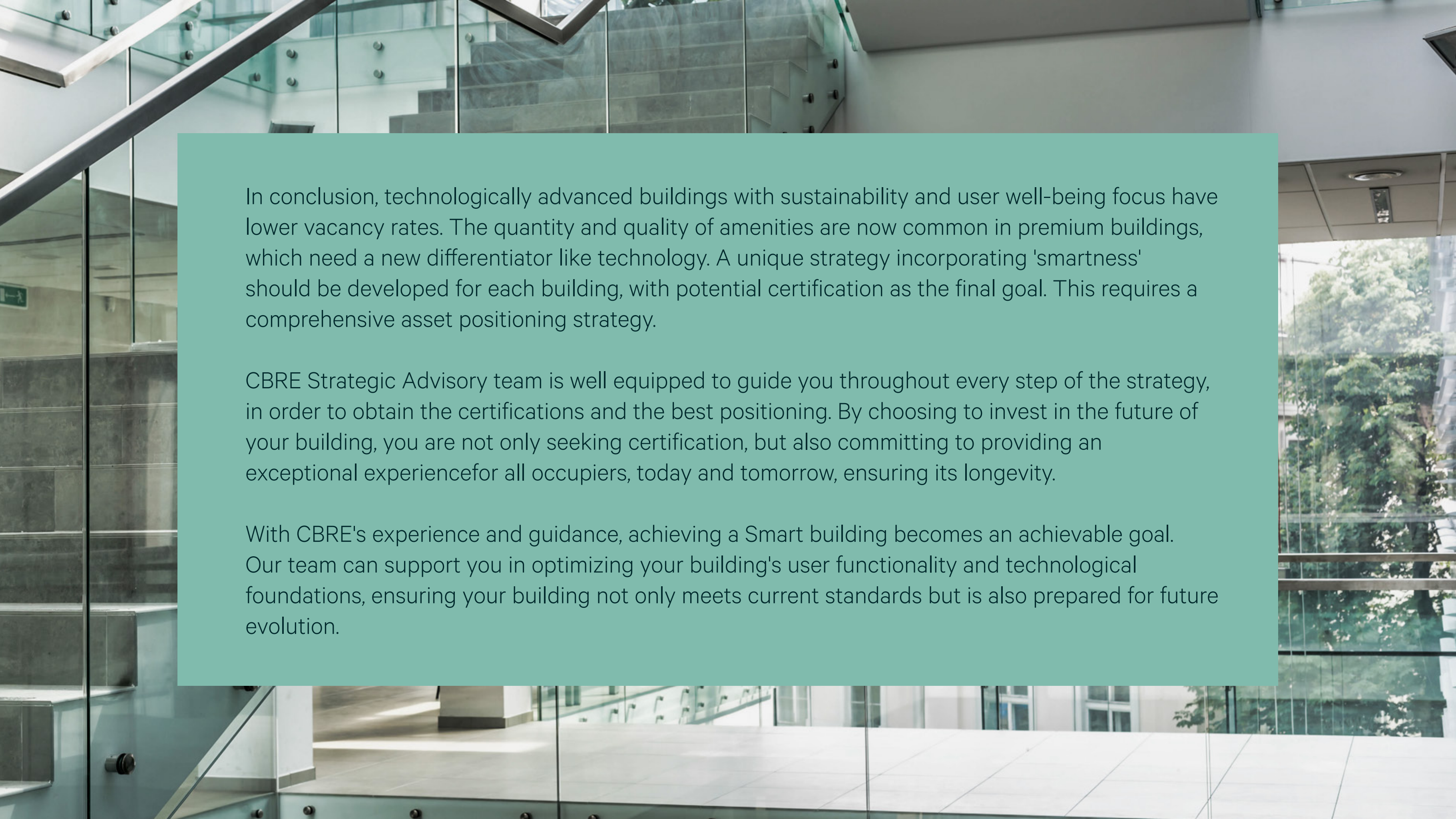


Product/Strategy
Definition



Certification



A modern building interior featuring a glass-enclosed staircase with a metal handrail. The background shows a bright, open-plan space with large windows and a tiled floor. The text is overlaid on a semi-transparent teal rectangle.

In conclusion, technologically advanced buildings with sustainability and user well-being focus have lower vacancy rates. The quantity and quality of amenities are now common in premium buildings, which need a new differentiator like technology. A unique strategy incorporating 'smartness' should be developed for each building, with potential certification as the final goal. This requires a comprehensive asset positioning strategy.

CBRE Strategic Advisory team is well equipped to guide you throughout every step of the strategy, in order to obtain the certifications and the best positioning. By choosing to invest in the future of your building, you are not only seeking certification, but also committing to providing an exceptional experience for all occupiers, today and tomorrow, ensuring its longevity.

With CBRE's experience and guidance, achieving a Smart building becomes an achievable goal. Our team can support you in optimizing your building's user functionality and technological foundations, ensuring your building not only meets current standards but is also prepared for future evolution.

Transforming properties into Smart Buildings

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