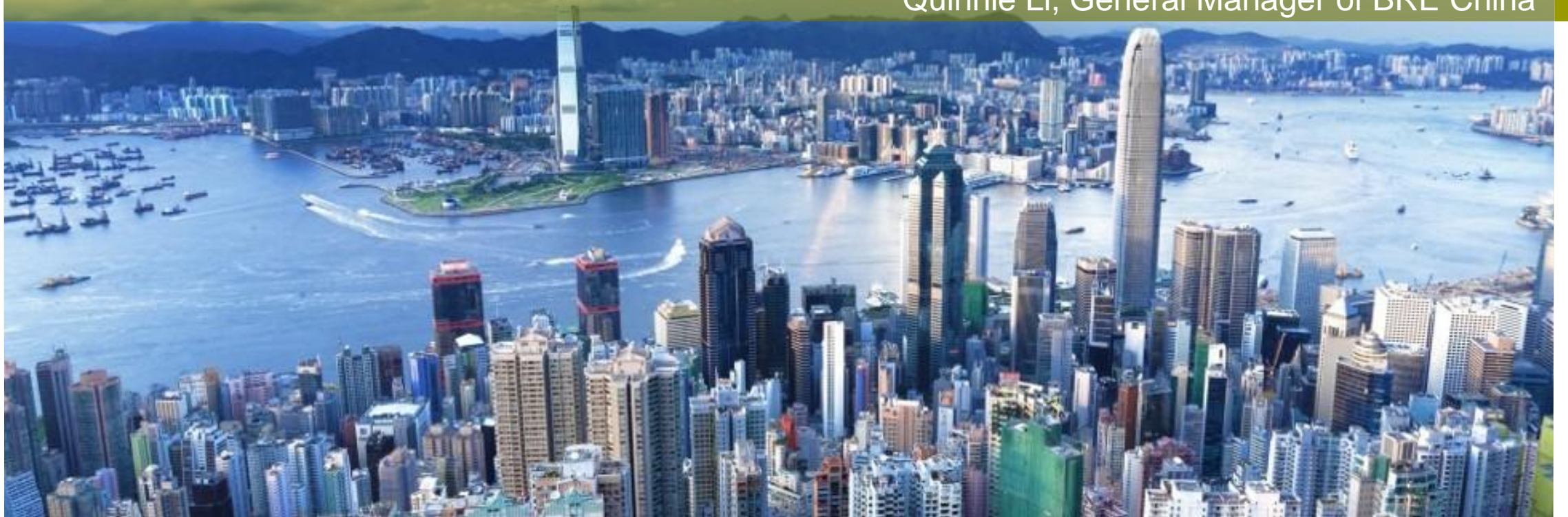


# Delivering better outcomes in the built environment

International benchmarking, best practice & skills for the future

Quinnie Li, General Manager of BRE China



# Introduction to BRE



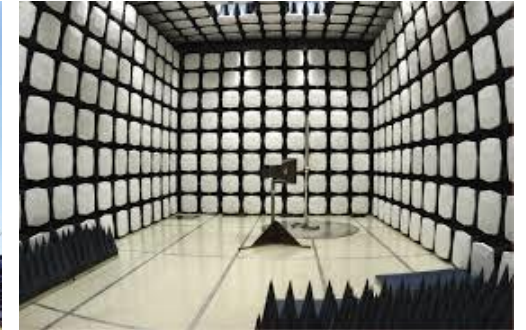
Worlds first built environment research centre:  
**Building Research Establishment**

Set up by the UK Government in 1921 to improve the quality and performance of buildings in the UK

Privatised in 1997, now owned by the BRE Trust which uses profits made by its companies to fund education and research for the benefit of society

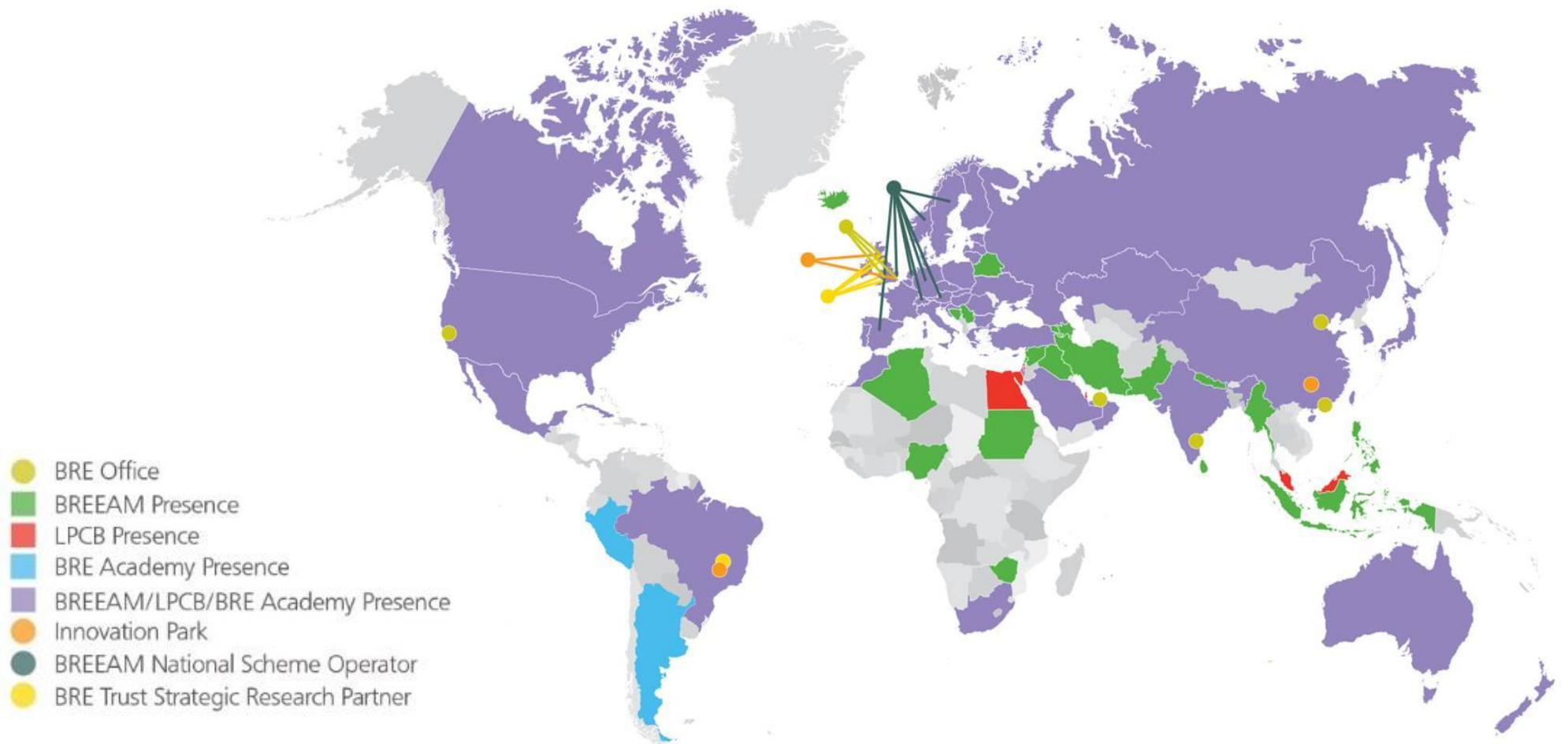
650 employees, 400+ professionally qualified,

Formal links to over 250 other experts through our associates and external partnerships



## BRE Trust

BRE Trust is the largest UK charity dedicated specifically to research and education in the built environment.



- BRE Office
- BREEAM Presence
- LPCB Presence
- BRE Academy Presence
- BREEAM/LPCB/BRE Academy Presence
- Innovation Park
- BREEAM National Scheme Operator
- BRE Trust Strategic Research Partner

**BREEAM**<sup>®</sup>  
delivered by bre

**CEEQUAL**<sup>®</sup>  
delivered by bre

**HOME  
QUALITY  
MARK**  
delivered by bre

**LPCB**<sup>®</sup>  
delivered by bre

**SABRE**  
delivered by bre

**breACADEMY**<sup>®</sup>

**YellowJacket**<sup>™</sup>  
delivered by bre

**CONSTRUCTING  
EXCELLENCE**  
delivered with bre



## From Product to Structure

**Fire ‘Passive’ protection:** Fire resistance, reaction-to-fire, cables, facades, installers

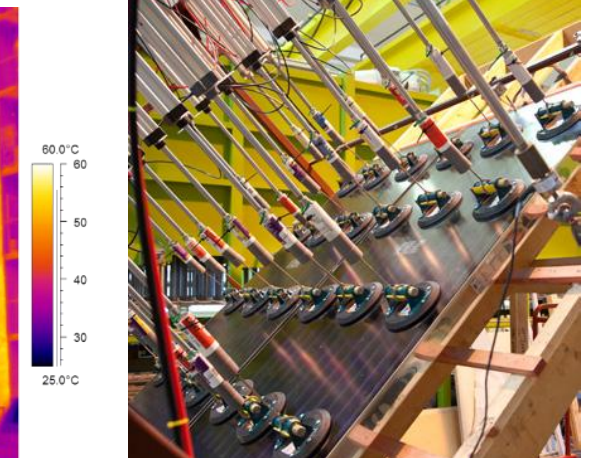
**Fire ‘Suppression’:** Automatic sprinkler systems, watermist, waterspray and deluge systems, fixed and portable fire fighting, approved designers, installation, service and maintenance

**Construction:** Structural engineering, investigation, wind engineering, airtightness, materials, acoustics, industry research, risk management, construction products certification

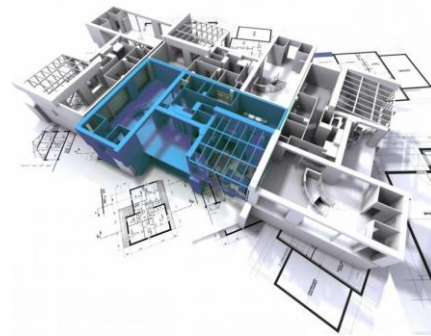
**Environment:** Indoor and outdoor air quality, HVAC, Lighting

**Expert Witness:** All areas and fire investigation

**Fire Safety:** Fire Safety Engineering, risk management



BRE Academy is the world's leading provider of built environment education & training



Recent BRE training sessions in Hong Kong

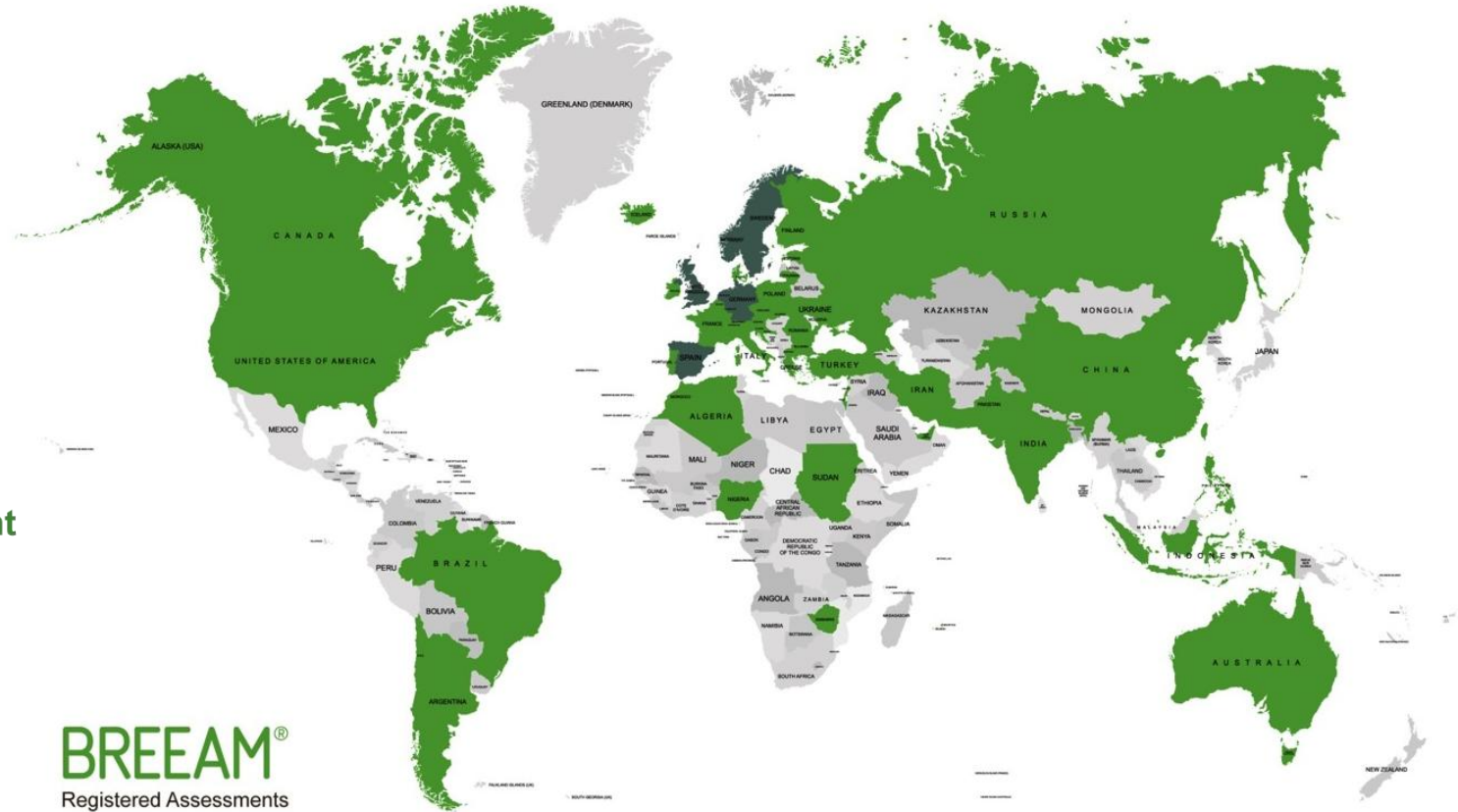
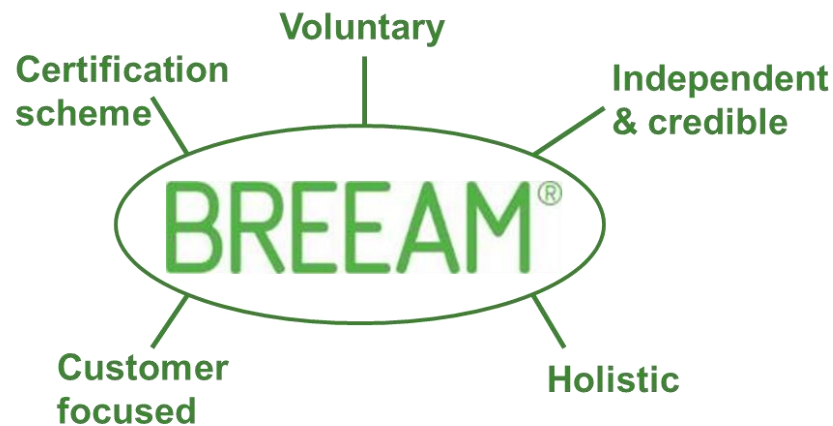


# Sustainability at BRE



Launched in 1990 – worlds first sustainability assessment method for buildings

- Applied in 83 countries
- 568,000+ certified buildings
- 2.2 million+ registered buildings
- 4,000+ assessors worldwide



## Across the built asset lifecycle



**CM** Communities  
MASTER PLANNING

**IF** Infrastructure

**NC** New  
Construction

**IU** In-Use

**RF** Refurb &  
Fit-out



Communities



Infrastructure



New Construction



In-Use



Refurb & Fit-out



Robust independent benchmark of building performance



Holistic metric: energy, water, waste, wellbeing – continually evolving – carbon, climate, circular economy



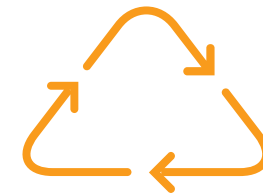
Owned by the BRE Trust: income and data fed back into research and development schemes



Allows for comparison of building performance on a global basis



Based on sound science and standards



Applied to the lifecycle of a building: design / construction / operation / refurb

## SUSTAINABLE DEVELOPMENT GOALS



- More and more the SDG's are of relevance to real estate clients.

- Alignment of BREEAM with regional benchmarks e.g. China 3 star
- BREEAM evolving with the market – technically more robust – can be a challenge

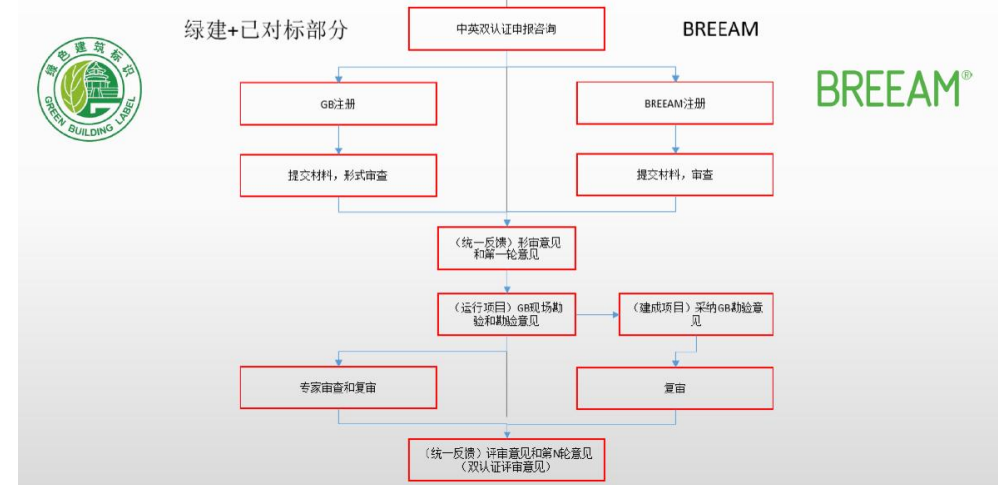
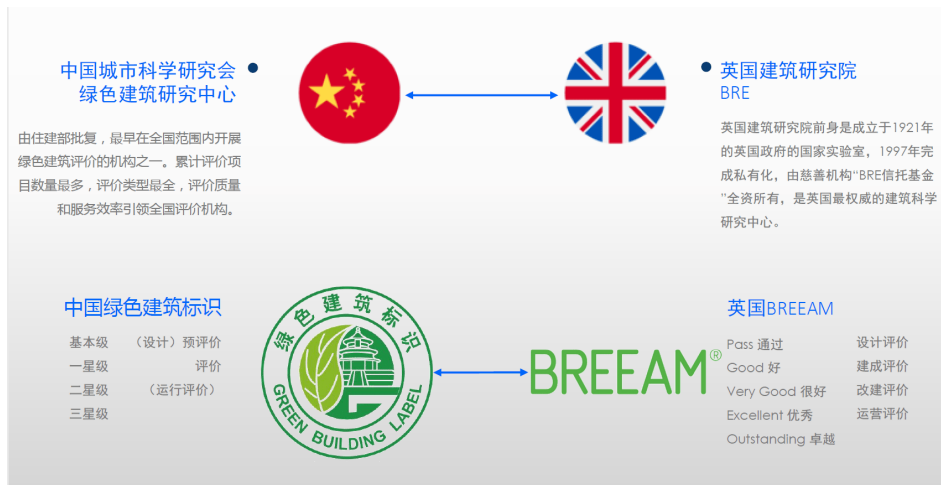


## UN Sustainable Development Goals and the BREEAM Family of Standards and Tools

**BREEAM makes a significant contribution to meeting 8 of the UN SDG goals and targets**

SUSTAINABLE DEVELOPMENT GOALS	BREEAM's Overarching Contribution to Sustainable Development Goals	Building Standards BREEAM <sup>®</sup> delivered by bre <small>HOME QUALITY MADE</small>	Communities Standard BREEAM <sup>®</sup> delivered by bre	Infrastructure Standard CEEQUAL delivered by bre	Shelter and Settlement Sustainability Tool QSAND
<b>1 NO POVERTY</b> End poverty in all its forms everywhere	Encourages the delivery of assets that are resilient and that use resources efficiently in order to reduce operational costs connected to the built environment (e.g. helping to alleviate fuel poverty; maintenance costs; access to affordable transport)	□	□	□	■
<b>2 ZERO HUNGER</b> End hunger, achieve food security and improved nutrition and promote sustainable agriculture	Encourages the delivery of assets that use land and resources efficiently, thereby maximising opportunities for self-help and relieving pressure on agricultural land and resources	□	□	□	□
<b>3 GOOD HEALTH AND WELL-BEING</b> Ensure healthy lives and promote well-being for all at all ages	Encourages the provision of comfortable, healthy and safe internal and external environments for asset users and others within the vicinity	■	■	■	■
<b>4 QUALITY EDUCATION</b> Ensure inclusive and quality education for all and promote lifelong learning	Encourages the provision of education and training opportunities to local communities, plus encourages ongoing learning through training and development courses for trades and professionals	□	□	□	■
<b>5 GENDER EQUALITY</b> Achieve gender equality and empower all women and girls	Encourages responsible sourcing and procurement principles in construction material supply chains	□	□	□	□
<b>6 CLEAN WATER AND SANITATION</b> Ensure access to water and sanitation for all	Encourages the provision of water efficient solutions, systems and equipment that minimise water consumption, whilst maintaining a clean and reliable supply	■	■	■	■
<b>7 AFFORDABLE AND CLEAN ENERGY</b> Ensure access to affordable, reliable, sustainable and modern energy for all	Encourages the provision of energy efficient solutions, systems and equipment that minimise energy consumption and carbon dioxide emissions, whilst maintaining a reliable supply	■	■	■	■
<b>8 DECENT WORK AND ECONOMIC GROWTH</b> Promote inclusive and sustainable economic growth, employment and decent work for all	Encourages measures that result in a positive economic impact and provision of training and skills to the local community	□	□	□	□
<b>9 INDUSTRY, INNOVATION AND INFRASTRUCTURE</b> Build resilient infrastructure, promote sustainable industrialisation and foster innovation	Promotes the delivery of sustainable and resilient buildings and infrastructure, and encourages and recognises innovations that improve the sustainability performance of assets and provides learning opportunities for wider dissemination	■	■	■	■
<b>10 REDUCED INEQUALITIES</b> Reduce inequality within and among countries	Encourages measures that result in a positive social impact and inclusivity, as well as encouraging responsible sourcing and procurement principles in construction material supply chains	□	□	□	□
<b>11 SUSTAINABLE CITIES AND COMMUNITIES</b> Make cities inclusive, safe, resilient and sustainable	Promotes the development of sustainable communities and encourages access to sustainable transport, delivery of affordable and safe homes, implementation of flood resilience measures, minimisation of air pollution, and access to public and green space	■	■	■	■
<b>12 RESPONSIBLE CONSUMPTION AND PRODUCTION</b> Ensure sustainable consumption and production patterns	Encourages the sustainable procurement and use of construction materials by recognising materials that are reused or recycled, are used in an efficient manner, have a low environmental impact, are sourced in a responsible way, and are durable and resilient	■	■	■	■
<b>13 CLIMATE ACTION</b> Take urgent action to combat climate change and its impacts	Encourages the sustainable use of energy, minimisation of greenhouse gas emissions, and implementation of climate change adaptation and flood resilience measures in one of the biggest contributing sectors globally	■	■	■	■
<b>14 LIFE BELOW WATER</b> Conserve and sustainably use the oceans, seas and marine resources	Encourages the prevention and control of pollution and surface water runoff associated with the location and use of assets	□	□	□	□
<b>15 LIFE ON LAND</b> Sustainably manage forests, combat desertification, halt and reverse land degradation, halt biodiversity loss	Encourages sustainable land use, protection and creation of ecological features, and improvement of long term biodiversity for asset sites and surrounding land	■	■	■	■
<b>16 PEACE, JUSTICE AND STRONG INSTITUTIONS</b> Promote just, peaceful and inclusive societies	Encourages responsible sourcing and procurement principles in construction material supply chains	□	□	□	□
<b>17 PARTNERSHIPS FOR THE GOALS</b> Revitalise the global partnership for sustainable development	Encourages the creation of strong international partnerships and relationships across policy, property, infrastructure and the supply chain to deliver and manage sustainable assets and communities	□	□	□	□
<b>KEY</b>		■ Significant contribution to meeting the UN goals and targets	□ Some contribution to meeting the UN goals and targets	□ Limited or indirect contribution to meeting the UN goals and targets	

## Alignment with BREEAM & China 3 Star



中国绿色建筑评价体系	BREEAM绿色建筑评价体系
《绿色建筑评价标准》(GB/T 50378-2014&2019)	BREEAM Communities (生态规划)
《绿色工业建筑评价标准》(GB/T 50878-2013)	BREEAM New Construction (新建建筑)
《绿色铁路客站评价标准》(TB/T 10429-2014)	Domestic、Non-Domestic
《绿色商店建筑评价标准》(GB/T 51100-2015)	BREEAM Refurbishment&Fit-out (整修与装配)
《绿色医院建筑评价标准》(GB/T 51153-2015)	BREEAM In-use (运营)
《绿色生态城区评价标准》(GB/T 51255-2017)	BREEAM Infrastructure (基础设施)
《绿色校园评价标准》(GB/T 51356-2019)	



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**BREEAM**<sup>®</sup> www.breem.com

简报  
评估中国可持续建筑的绩效 —  
英国建筑研究院环境评估方法与中国绿色建筑评估标准（三星标准）的协同性

Chris Ward 博士、Alan Yates 和 Vicky Brown (闫岩) - 英国建筑研究院



**bre**

lopment in China  
of **BREEAM** and  
eat improvements  
China's authorities  
s important  
**sustainable future**



# Six environmental regions

## BREEAM can adjust different requirements in different regions

BREEAM categorized China into six regions, the weighting will be different according to different environments, population, and etc.



Number of BREEAM Professionals in Greater China  
大中华区 BREEAM 专业人员数量

**72 BREEAM Assessors**  
72 名 BREEAM 评估师

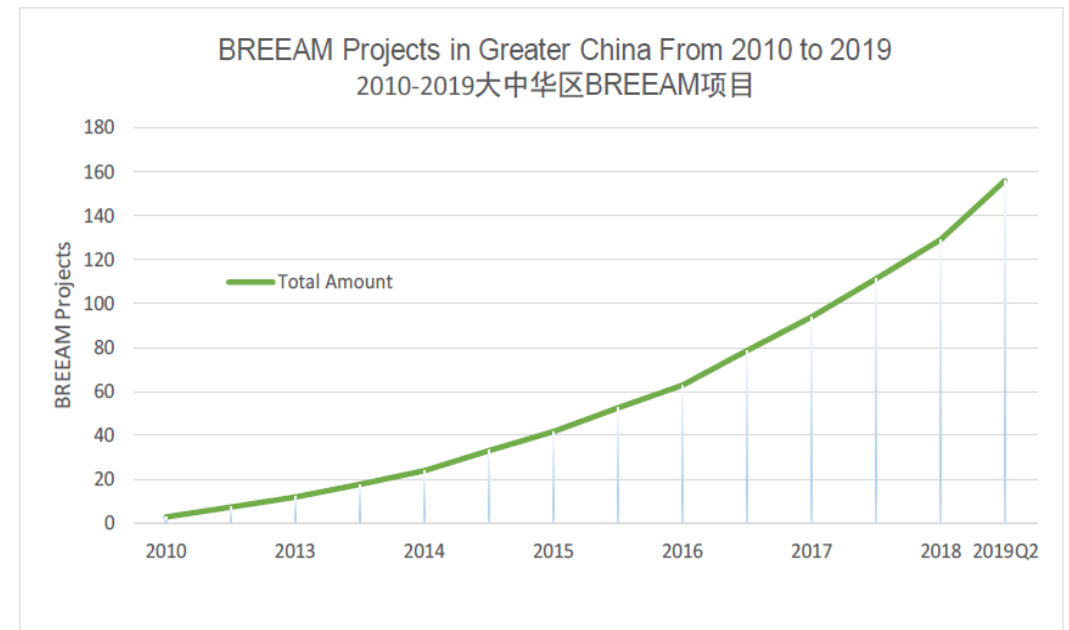
**65 BREEAM APs**  
65 名 BREEAM 特许从业专家

**55 Accredited Professional Companies**  
55 家提供 BREEAM 咨询及认证服务的机构

Number of certified / registered buildings  
认证 / 注册建筑的数量

**106 certified buildings (BREEAM Projects)**  
106 座认证建筑 (BREEAM 项目)

160个已注册项目



# BREEAM projects in China



## Land Securities carried out analysis on 101 BREEAM assets:



- BREEAM certification is a significant variable in rental performance
- A 28% variability in contracted rents portfolio wide can be explained by the presences of BREEAM certification
- BREEAM Excellent rated assets outperformed non-certified assets by 100% - average contracted rents were £47.50/ft<sup>2</sup> vs. £23/ft<sup>2</sup>

**Source:** UKGBC “Capturing the value of sustainability: Identifying the links between sustainability and business value” Page 27; Published January 2018.



## What is ESG?



### ENVIRONMENTAL (E)



Climate change



Greenhouse gas (GHG) emissions



Resource depletion



Waste & pollution



### SOCIAL (S)



Working conditions



Impact on local communities



Health & safety



Employee relations & diversity



### GOVERNANCE (G)



Executive pay



Bribery & corruption



Political lobbying & donations



Board diversity & structure



Hang Seng Corporate Sustainability Index Series



Dow Jones Sustainability Indexes



FTSE4Good



Global Reporting Initiative™



TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES



Principles for Responsible Investment

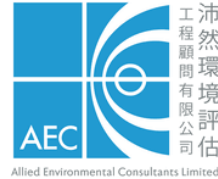


G R E S B<sup>®</sup>

# Driving building performance

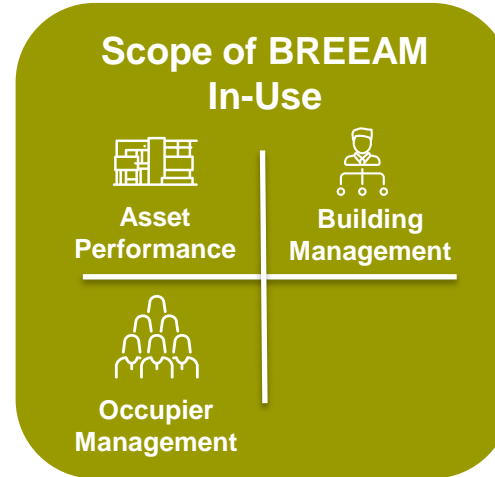
## International Commerce Centre Hong Kong

BREEAM In-Use



### Highlights

- First BREEAM In-Use project in Hong Kong
- The Client want to achieve the best practice of the building by applying BREEAM In-Use.



# Driving better environmental, social and economic outcomes in civil engineering



CEEQUAL is the evidence-based sustainability assessment, rating and awards scheme for civil engineering, infrastructure, landscaping and public realm projects.

- Provides investors, governments & regulators with an infrastructure sustainability benchmark.
- Meets global market demand as the single world leading sustainability rating scheme for infrastructure.
- CEEQUAL addresses some of the most pressing issues the industry faces including climate change, carbon and resilience.



Hong Kong CEEQUAL certified projects – all achieving ‘Good’ and above performance:



Kai Tak Development, Reconstruction and upgrading of Kai Tak Nullah



Wan Chai West Preliminary Treatment Works demolition



Widening of Tolo/ Fanling Highway



Salt Water Supply for Pok Fu Lam Area



# SmartSite Digital Site Supervision

Software for better site safety, health, environmental and quality performance

Action management

Process efficiency

Productivity improvement



Software tools to help you meet productivity, safety, health, environmental and quality needs.



# What is SmartSite?

Driving efficiency and increasing performance through projects, organisations and supply chains.



**SMARTWASTE**  
delivered by bre



**YellowJacket**  
delivered by bre



# Effective BIM integration to deliver better outcomes: BIM ISO19650



- ICT is an important enabler and driver of change, starting with digital and BIM.
- UK BIM Level 2 Mandate in 2011, 2013 PAS1192
- **ISO19650** launched in 2019 - the first international standard for information management

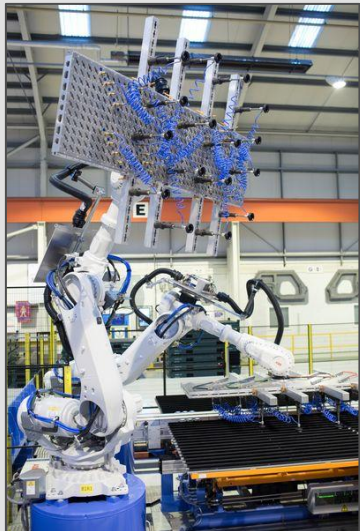


# Raising the bar for off-site construction



## BPS 7014: from standard to certification scheme

BRE Group is establishing the standard, BPS 7014, providing the basis for a certification scheme for offsite construction systems and components. BPS 7014 complements existing sector standards and initiatives, such as the Build Offsite Property Assurance Scheme (BOPAS).



## Purpose of Assessment Methodology

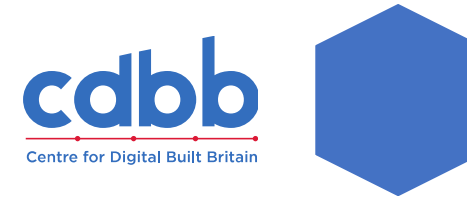
- To provide a route to certification for offsite systems for use in the construction of residential buildings. The key objectives:
- Encourage **new methods of construction** and **advanced manufacturing techniques** whilst maintaining **acceptable levels of safety and durability**.
- Create **confidence** in the use of offsite methods in residential construction.
- Demonstrate **compliance** with relevant building regulations and national building codes, as well as **enhancing characteristics** where appropriate.
- Identify the **comfort** and **wellbeing** benefits to the householder.

### Key stakeholders





# TRANSFORMING PERFORMANCE AND PRODUCTIVITY IN THE CONSTRUCTION INDUSTRY





# Construction Sector Deal



**£170m**

Government  
funding

**£250m**

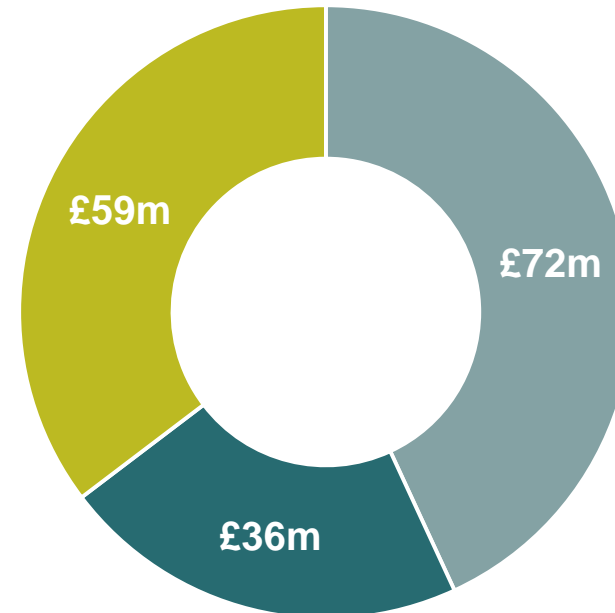
Matched industry  
funding

**4 years**

of funding

**Sustainable**

long-term model



- Construction Innovation Hub
- Active Building Centre
- R&D Projects

Network+

# Construction Innovation Hub



- Product Family Architectures and Standardised Component sets
- Process Engineering Solutions
- Government Department Discovery and Analysis
- Physical Demonstrators



- Engagement and Skills
- Demonstration, Testing and Validation
- Built Environment Performance
- Digital Product Data and Building Regulations



- Digital Transformation across Asset Lifecycle
- Asset Management and Digital Twins
- Contracting and Business Models for the Digitally Enabled Built Environment
- Impact Assessment
- Driving Change and Growth

# Catalyst for transformation

Our mission is to be a catalyst for transforming the UK construction sector through manufacturing technologies and digital ways of working – boosting productivity, exports and asset performance to benefit society.



## Digital

Delivering better, **more certain outcomes** using digital technologies



## Manufacturing

**Improving productivity**, quality and safety by increasing the use of manufacturing



## Performance

**Optimising through-life performance** through the development of smart assets

bre

building a better world together