

VIEWPOINT

ASIA PACIFIC RESEARCH | DEC 2018

CBRE Research

# Green Buildings: Everything Investors Need to Know

CBRE

INTRODUCTION

The environmental impact of higher temperatures, huge volumes of municipal solid waste and worsening air quality are increasingly evident in the cities we live in.

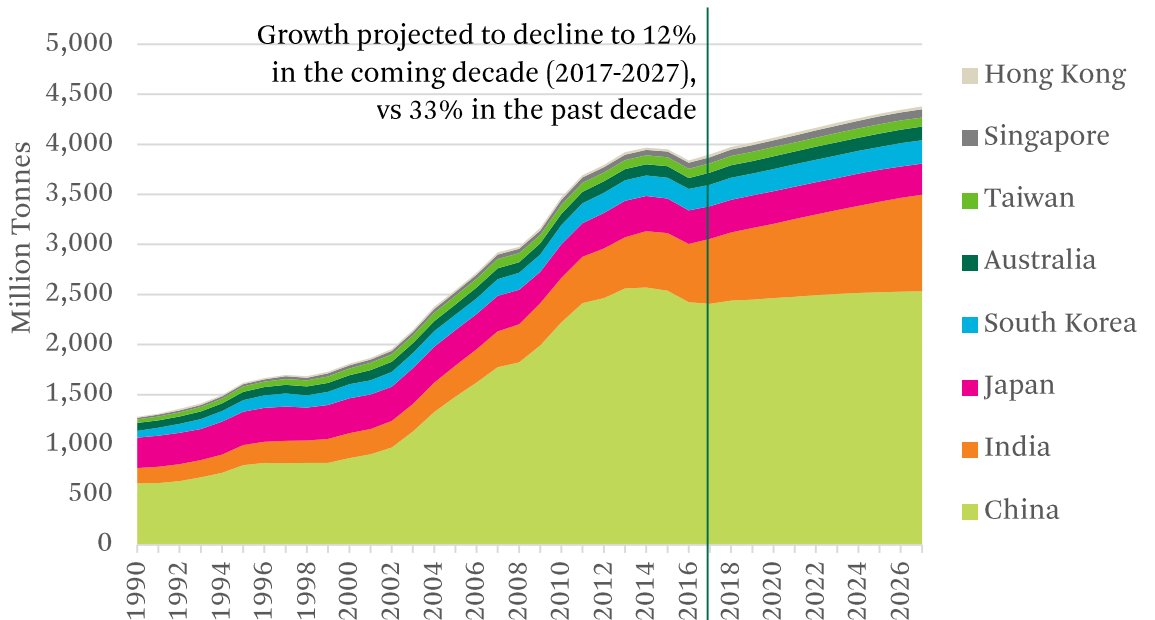
With a significant proportion of the urban population spending much of their time in commercial buildings, the onus is on the real estate industry to provide sustainable properties that mitigate negative environmental impacts.

Many countries in Asia Pacific are implementing aggressive measures to address environmental challenges such as rising carbon emissions, which is spurring the introduction of incentives to construct green buildings.

At the same time, technological advancement is driving the growth of green properties, with low cost energy-efficient devices and monitoring systems increasing the value proposition for investors.

This ViewPoint by CBRE Research tracks recent green office building trends in Asia Pacific and explains the market forces and regulatory changes that will require investors to strengthen their commitment to greening their portfolios.

Figure 1: Asia Pacific carbon emissions



Source: Oxford Economics, September 2018

## GREEN BUILDINGS – A PRIMER

The World Green Building Council (WGBC) defines a green building as “a building that, in its design, construction or operation, reduces or eliminates negative impacts, and can create positive impacts, on our climate and natural environment.”<sup>1</sup>

The four core elements of green buildings encompass the following:

- **Energy:** Ensure the effective use of resources and minimise waste by incorporating energy-efficient lighting and low energy appliances
- **Water:** Include efficient water management systems
- **Materials:** Use natural, renewable and recyclable resources that have been managed and harvested to reduce their environmental impact
- **Air:** Provide an indoor environment featuring high quality air supply and thermal comfort

Additional elements of green buildings include on-site renewable energy generation and measures to enhance occupants’ comfort and health.

Green buildings are subject to international and/or national rating and certification systems. The most common and mature rating system is Leadership in Energy and Environmental Design (LEED) from the U.S..

Several major Asia Pacific markets have used LEED as the framework to develop their own rating systems based on the local climate and urban environment. Examples include Australia’s Green Star, Hong Kong’s BEAM Plus and Singapore’s Green Mark.

China and a number of other emerging markets have adopted LEED as their own local green building standards are still under development.



<sup>1</sup> <https://www.worldgbc.org/what-green-building>

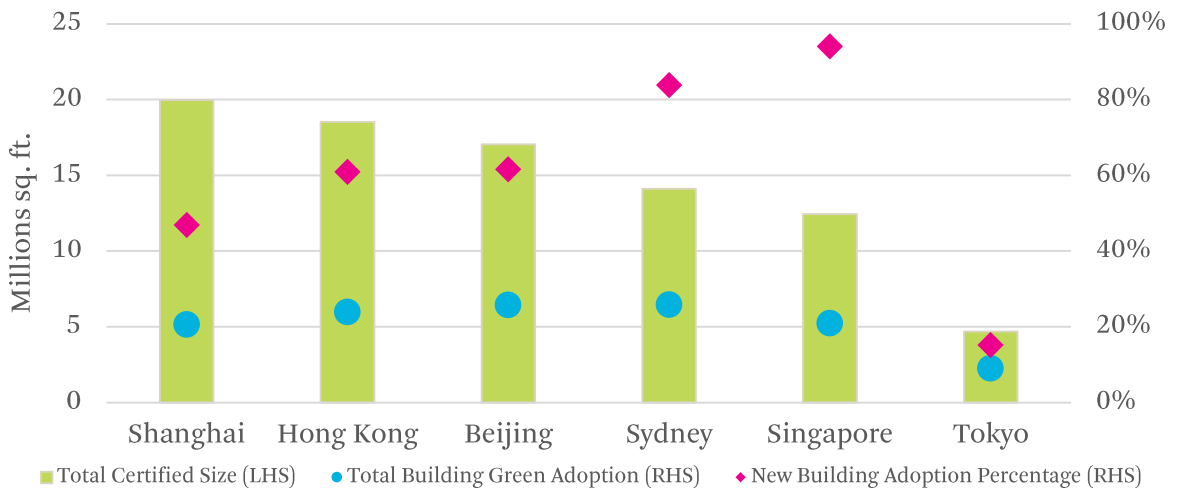
**GREEN BUILDINGS IN ASIA PACIFIC**

A recent CBRE Research study of office buildings in six major gateway cities in Asia Pacific (Shanghai, Hong Kong, Beijing, Sydney, Singapore and Tokyo) found that 23% have achieved some form of green certification <sup>2</sup>, compared to a ratio of 41% in the U.S. <sup>3</sup>. Shanghai possesses the largest volume of green office space, with more than 20 million sq. ft. certified as of 2018.

Given the technical difficulties involved in retrofitting existing buildings with green features, certification is highly skewed towards newer properties. Around 53% of office buildings less than five years old and with a net floor area greater than 100,000 sq. ft. in the cities under study were found to possess green certification.

Singapore and Sydney both have a green certification rate of more than 80% for new buildings, followed by Shanghai and Beijing. In Tokyo, the language barrier has inhibited the certification of office buildings as LEED is only available in English, although many properties in this market have installed energy efficiency and low-carbon features.

**Figure 2: Green building adoption in total and new office buildings**



Source: International Green Building Adoption Index 2018, Towards Excellence – Market Performance of Green Commercial Buildings in the Greater China Region, CBRE and CBRE Research, 2018

<sup>2</sup>The green office building adoption percentage is calculated using CBRE Research data on total office stock. Local green building rating systems are used for Hong Kong, Sydney and Singapore, while LEED is used for China (Beijing and Shanghai) and Tokyo.

<sup>3</sup>U.S. Green Building Adoption Index 2018, CBRE, 2018



## DRIVERS OF GREEN BUILDINGS

The growth of green office buildings in Asia Pacific, particularly of new developments, is being driven by government regulations and incentives; their ability to deliver significant cost-savings for landlords and tenants; and the growing business emphasis on corporate social responsibility.

### *Government Regulations and Incentives*

Government policy is playing a key role in promoting the growth of green buildings in Asia Pacific. Measures include mandatory regulations requiring compliance with codes relating to building construction and operation along with various incentives to encourage the development of green buildings.

In Singapore, the government's third Green Building Masterplan published in 2014 included the target of achieving the local Green Mark standard for 80% of all buildings by 2030. The current adoption rate stands at 27%.

New buildings in selected areas including Marina Bay are required to achieve a mandatory level on the Green Mark Standard. For existing properties, authorities provide up to 50% of the cost to retrofit buildings with energy efficient features, capped at SGD 3 million (US\$2.2 million) for property owners and SGD 20,000 (US\$14,600) for office tenants.

In Australia, all commercial offices larger than 1,000 sq. m. must perform energy efficiency evaluations and disclose their National Australian Built Environment Rating System (NABERS) energy rating, while all government offices with a net lettable area larger than 2,000 sq. m. must achieve a minimum 4.5 out of 6 stars on the NABERS system.

Some states have also introduced their own measures, such as New South Wales' provision of incentives for landlords of commercial properties to upgrade to energy-saving lighting systems.

Cost-savings

Property owners and occupiers in Asia Pacific are increasingly cognisant of the cost-savings that can be achieved by reducing energy and water usage as well as the knock-on effect this can have on future operating and maintenance costs.

Numerous landlords in the region have implemented various environmental and sustainability measures that have successfully reduced facilities management costs, with some larger buildings reporting savings in excess of US\$1 million per year.

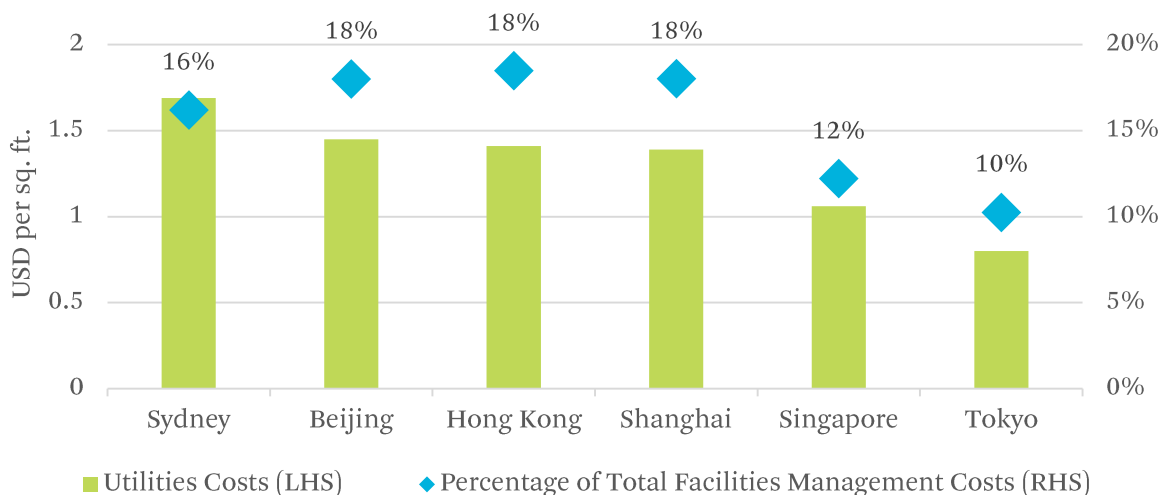
**Table 1: Examples of green measures and corresponding money saved**

CITY	PROPERTY	BUILDING SIZE (SQ. FT.)	GREEN MEASURES IMPLEMENTED BY LANDLORD	MONEY SAVED (US\$ PER YEAR)
Singapore	Galaxis	741,000	<ul style="list-style-type: none"> <li>• Extensive greenery</li> <li>• High efficiency air-conditioning</li> <li>• Eco-friendly interior fitting and materials</li> <li>• Intelligent lighting controls</li> </ul>	1,230,000
Melbourne	321 Exhibition Street	325,000	<ul style="list-style-type: none"> <li>• Modern air-conditioning system</li> <li>• Low energy LED lighting</li> <li>• Intelligent Building Management Control System</li> </ul>	87,000
Singapore	Visioncrest Commercial	172,000	<ul style="list-style-type: none"> <li>• Energy efficiency improvements through no/low cost energy conservation measures and enhancements to building management policies and processes</li> </ul>	180,000

Source: ANREV and CBRE, 2018

Utilities account for around 10 – 20% of total facilities management costs and hence are an obvious target for cost-savings. However, energy and sustainability measures can keep utilities costs steady and, in some cases, even reduce them.

**Figure 3: Cost of utilities and percentage of total facilities management costs**



Source: Asia Pacific Fit-Out Cost Guide 2018, CBRE, 2018

While investing in different green measures can save facilities management operating costs, the payback period must also be considered. Urban Land Institute (ULI) research on the money saved and aggregate payback period of different building-level sustainability projects by its worldwide members found that energy audits, which determine how energy is used and then provide recommendations of behavioural improvements that can reduce energy use and costs, have a payback period of just two years <sup>4</sup>.

Upgrading or replacing building management systems and appliances with more energy efficient ones involves a longer payback period ranging from three to six years. Building Automation System (BAS) and Energy Management System (EMS) projects provide a systematic approach to conserving energy while maintaining indoor comfort.

Projects relating to water treatment/recycling and renewable energy involve a much higher payback period of over 10 years as they require up-front investment and physical alterations to the property.

Measures include systems to treat wastewater on-site and storm water reuse systems to recycle collected water. On-site renewable energy generation depends on weather conditions and available space and therefore only contributes to a lower percentage of total energy consumption.

**Table 2: Building-level efficiency projects in Greenprint member properties**

<b>PROJECT TYPE</b>	<b>NO OF INVESTIGATED PROJECTS</b>	<b>AVERAGE PAYBACK (YEARS)</b>
Behavioural change through energy audits	102	2.0
Lighting and controls	129	2.9
BAS/EMS upgrades and replacements	80	5.7
Appliances and electronic equipment	137	5.7
Water projects	123	>10
Renewable energy projects	129	>10

Source: Greenprint Performance Report Volume 8, Urban Land Institute, 2017

<sup>4</sup>Greenprint Performance Report Volume 8, Urban Land Institute, 2017



### *Corporate Social Responsibility*

Corporate social responsibility disclosure and compliance is another significant driver of green building adoption, with companies now demonstrating a greater commitment to improving the wellbeing of their employees, the communities they operate in and the broader environment. This has resulted in more companies developing or occupying green buildings and publicly reporting on their environmental performance.

Occupant health and wellbeing is a key focus. CBRE Research's 2018 Asia Pacific Occupier Survey found that 72% of corporations surveyed operate employee wellness programmes in their workplace. These programmes include green features that utilise natural lighting; sufficient ventilation; and functions to adjust the indoor environment, all of which can safeguard employees' health and ultimately improve productivity and satisfaction.





RECOMMENDATIONS FOR INVESTORS

CBRE Research believes that investors cannot afford to ignore the shift towards a sustainable built environment. They must formulate strategies to preserve and enhance their portfolios to ensure they stay relevant in this new paradigm. Measures may include the following:

*Benchmark Sustainability Performance*

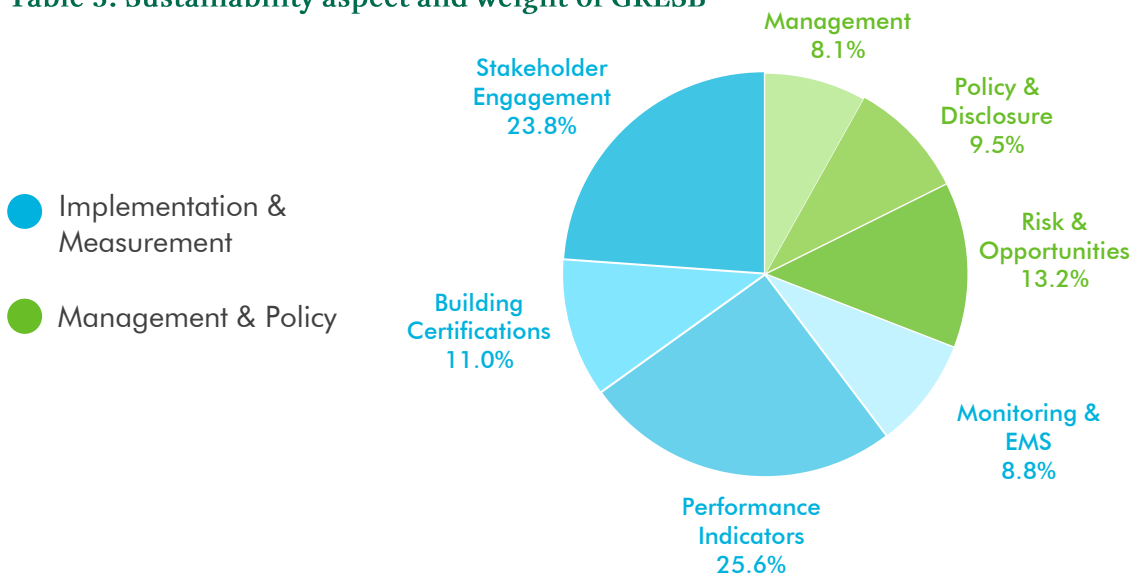
In addition to their financial performance, investors including REITs and funds are increasingly subject to environmental, social and governance (ESG) evaluation by their investors and other stakeholders.

A 2018 report by the Responsible Investment Association Australasia (RIAA) found that 55% of all core funds in Australia are now implementing responsible investment strategies and are demonstrating outperformance compared to their equivalent Australian and international share funds and multi-sector growth funds.

Evaluation tools include the Global Real Estate Sustainability Benchmark (GRESB), launched in 2009, which enables investors to monitor and benchmark the sustainability performance of their portfolio.

GRESB collects information and evaluates the sustainability performance of investors against seven criteria (Table 3) which each contain approximately 50 indicators. This enhances the transparency of ESG performance and can also serve as an indicator of the long-term risk-adjusted returns of investors’ portfolios.

**Table 3: Sustainability aspect and weight of GRESB**



Source: GRESB, 2018



Almost 70% of GRESB's weighting is related to environmental performance data regarding energy and water consumption, green-house gas emissions and waste saving. The remaining 30% weighting is based on management and policy aspects including sustainability risk assessments and ESG improvement policies for employees, tenants and the wider community.

A total of 903 property companies and institutional investors participated in GRESB in 2018, an increase of 6% compared to the previous year. These companies operated more than 79,000 assets worth a total US\$ 3.6 trillion in 64 countries. Around 200 Asia Pacific-based firms participated in GRESB in 2018, lagging Europe (446) and North America (220).

GRESB is set to continue to gain popularity as investors increasingly consider that commitment to ESG goals signals industry leadership, better management and forward-thinking. GRESB enables investors to improve asset management, track performance against their peers and identify strengths and weaknesses, ultimately helping them prioritise resources for necessary improvements.

### *Explore the Development of Net Zero Buildings*

The WGBC defines a net zero building (often also referred to as a zero-energy building) as a building which is highly energy efficient and fully powered by on-site and/or off-site renewable sources.

In September 2018 the first global Net Zero Carbon Buildings Commitment was officially launched in San Francisco as part of the Global Climate Action Summit. 22 cities including Sydney and Tokyo from Asia Pacific signed up to the commitment. Corporate signees include Singapore-based Frasers Property.



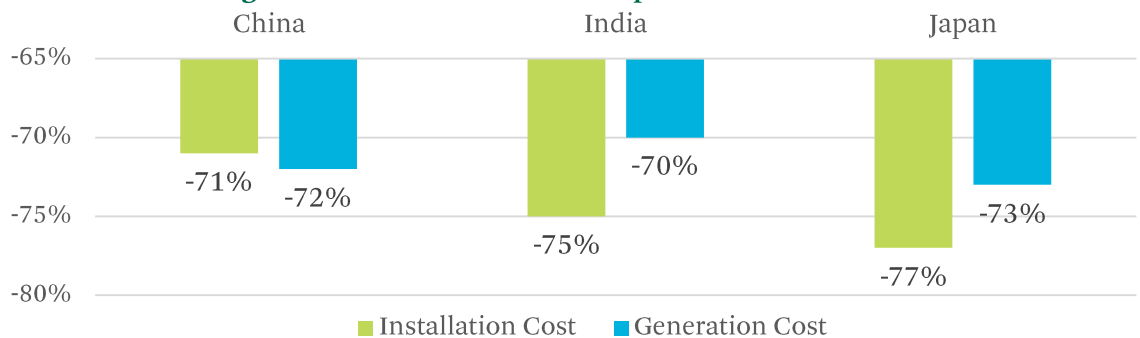
The commitment requires participants to significantly cut greenhouse gas emissions and ensure that all new buildings completed from 2030 must operate at net zero carbon. All buildings, old and new, must operate at net zero carbon by 2050.

Cities that have signed up to the commitment must evaluate current energy demand and emissions from municipal buildings; establish a roadmap to meet their obligations; develop a suite of supporting incentives and programmes; and make annual progress reports.

With city and national governments set to introduce regulations and policies to drive the development of net zero buildings, CBRE Research believes investors must move quickly to evaluate all possible measures to boost energy efficiency and embrace renewable technology.

However, renewable energy still only accounts for a small percentage of total energy consumption and on-site generation is insufficient to meet demand. City administrators must perform extensive upgrades to their electrical grids to significantly increase the generation of renewable energy.

**Table 4: Percentage reduction in cost of solar photovoltaics since 2010**



Source: Renewable Power Generation Cost in 2017, IRENA, 2018

Nevertheless, recent advances in technology have significantly reduced the capital investments required for energy projects, with the installation and electricity generation cost of solar photovoltaics in China, India and Japan falling by more than 70% since 2010. This is expected to support the development of net zero carbon buildings.

In Australia, while the average electricity cost rose nearly 140% to AUD 110.17 MWH between 2012 and 2017, the cost of a large-scale solar installation fell by 24% over the same period <sup>5</sup>, making it financially viable to switch to renewables.

<sup>5</sup> Data from The Australian Energy Market Operator (AEMO) average wholesale pool prices across the National Electricity Market (NEM) and Solar Choice commercial installation cost analysis



*Capitalise on Incentives and Financial Support*

Many governments in Asia Pacific are promoting renewable energy use through Feed-in Tariff (FiT) policies, whereby electricity companies purchase the energy generated from private renewable energy projects at a fixed price over a set term to cover installation and operating expenses.

This can provide investors with additional bonus payments for electricity they sell, which can be two to three times the electricity price paid. FiT can also reduce the payback period to about six to ten years.

**Table 5: Feed-in tariff of solar energy in selected Asia Pacific cities**

	<b>CHINA</b>	<b>JAPAN</b>	<b>THAILAND</b>	<b>HONG KONG</b>
Year of introduction	2011	2012	2013	2019
Rate of FiT* (US\$ per kWh)	0.08 – 0.11	0.17	0.19 – 0.21	0.38 – 0.64
Rate of electricity (US\$ per kWh)	0.07	0.14	0.10	0.14 – 0.16
Money saved (US\$ per kWh)	0.01 – 0.04	0.03	0.09 – 0.11	0.22 – 0.50

\* Rate of FiT depends on the installation size and rate of electricity depends on location and amounts of usage. Exchange rate as at the end of September 2018.

Source: Local utilities web site

Property owners are also advised to make greater use of investment opportunities derived from government regulations and policies. In Australia, investments in energy efficient commercial buildings through Managed Investment Trusts (MIT) are subject to a lower income tax rate of 10% compared to the usual 15-30% (amount varies depending on the investor’s residence).

Gross floor area concession schemes can also provide property owners with considerable benefits by allowing additional floor area for properties certified under green building rating schemes. Singapore’s Green Mark Gross Floor Area incentive scheme provides 2% additional GFA to developers if the property achieves a Green Mark Platinum rating.



**A NEW ERA OF GREEN BUILDINGS**

Government regulations and incentives; greater awareness of potential cost-savings; and the shift towards corporate social responsibility will continue to drive the growth of green buildings in Asia Pacific.

Table 6 provides a summary of these drivers together with broad recommendations and specific advice for investors to consider.

The shift toward green buildings is now firmly established as a structural trend and will continue to deliver measurable benefits for investors, employees and the broader community via lower costs, better indoor air quality and reduced energy usage.



**Table 6: Drivers and recommendations for investors considering developing green buildings**

DRIVERS	ACTION POINTS	ADVICE
Government support	Capitalise on incentives and financial support to lower barriers to entry	<ul style="list-style-type: none"> <li>Consult green building professionals for advice on policy support and sustainability certification schemes</li> </ul>
Corporate social responsibility	Benchmark the sustainability and environmental performance of properties and portfolios	<ul style="list-style-type: none"> <li>Examine consumption and emissions across portfolios</li> <li>Provide the results of benchmarking exercises to investors/tenants</li> <li>Formulate sustainability strategies</li> </ul>
Cost-savings	Explore the development of net zero buildings	<ul style="list-style-type: none"> <li>Identify opportunities to reduce wastage</li> <li>Power buildings using renewable sources</li> </ul>

Source: CBRE Research, December 2018



**CBRE GLOBAL RESEARCH**

This report was prepared by the Asia Pacific research team which forms part of CBRE Global Research – a network of preeminent researchers who collaborate to provide real estate market research and econometric forecasting to real estate.

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