

APAC Decarbonization in Real Estate

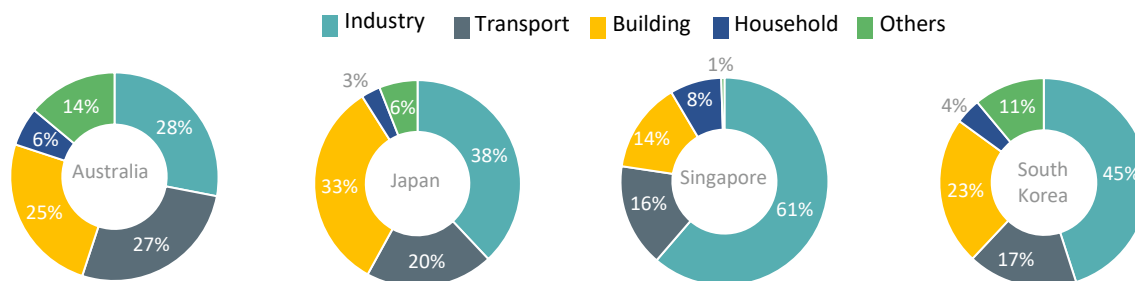
May 2023

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- A combination of measures is required to achieve the decarbonization targets by 2030 and 2050 for the real estate sector, including improving access to renewable energy to both the energy grid and to buildings. This coupled with improvements in buildings energy performance will support the transition towards net zero.
- Tokyo, Sydney and Melbourne as part of the C40 cities initiatives have pledged to enact regulations and/or planning policy to ensure new buildings operate at net zero carbon by 2030 and all buildings by 2050.
- The ambitious targets to reduce greenhouse gas emissions set by governments globally will drive both real estate owners and occupiers to comply with more stringent sustainability requirements.
- Tighter regulations on building efficiency standards present opportunities to refurbish existing, well-located, grade B stock in markets with low vacancy.

In Asia Pacific, the building sector accounts for between 14% to 33% of direct and indirect CO₂ emissions from usage of energy and heat (Exhibit 1). According to the International Energy Agency (IEA), aligning the building sector to the decarbonization targets in 2030 and 2050 requires a combination of measures. These include improving access to renewable energy at both the energy grid and building level as well as undertaking efforts to improve buildings energy performance.¹

Exhibit 1: Share of CO₂ Emissions by Sector (2021)



Source: Note: Total CO₂ emissions include direct and indirect emissions from usage of electricity and heat. Singapore's share of CO₂ emissions by sector are figures as of 2020. Source: www.climate-transparency.org, National Climate Change Secretariat Singapore. As of April 2023.

¹ IEA (2022) Roadmap for Energy-Efficient Buildings and Construction in ASEAN

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C40 Cities Initiatives

A major network of global cities has been collaborating on climate change including the C40 cities initiatives which aims to halve the emissions of its member cities within a decade. Out of the C40 cities, 23 cities have signed the C40 Net Zero Carbon Buildings, pledging to enact regulations and/or planning policy to ensure new buildings operate at net zero carbon by 2030 and all buildings by 2050. In order to meet this commitment, these cities will need to establish a roadmap to achieve net zero carbon buildings and report the progress of regulation and policy towards the targets amongst others.

In Asia Pacific, the C40 signatories include cities such as Tokyo, Sydney and Melbourne (Exhibit 2). In Australia for example, the city of Melbourne has introduced the 1,200 Buildings Program in 2010 as part of the city’s commitment to become a carbon neutral city. The program targets 1,200 existing commercial assets including offices, hotels and university facilities by encouraging building owners to take part in retrofitting and energy efficiency upgrades. However, this approach alone is not enough in getting all the buildings to achieve net zero carbon. Indeed, the Australian government have implemented The Commercial Building Act that requires mandatory energy efficiency information to be provided for office buildings of 1,000 sqm or more to better track building performances.

Across the C40 signatory cities, the drive towards more ambitious policies and targets were clear with major cities committed to reduce average per capita emissions by half in 2030. On the real estate front, efforts to decarbonize buildings are also underway via reducing gas usage and fossil fuel for heating systems. In addition, building owners are increasing the use of renewable energy through on-site and off-site renewable energy procurement.

Exhibit 2: C40 Signatories and Commitment

| Major C40 Signatories | | Commitment 1: New Buildings |
|---------------------------|--------------------------------|---|
| Commitment 1 and 2 | Commitment 1, 2 & 3 | Enact regulations and/or planning policy to ensure new buildings operate at net zero carbon by 2030. |
| London | Cape Town | Commitment 2: Existing Buildings Enact regulations and/or planning policy to ensure all buildings operate at net zero carbon by 2050. |
| Los Angeles | Copenhagen | |
| New York City | Heidelberg | |
| San Francisco | Johannesburg | |
| Seattle | Melbourne | |
| Tokyo | Montreal | |
| Washington DC | Oslo | |
| | Paris | |
| | Portland | |
| | Stockholm | |
| | Sydney | Commitment 3: Municipal Buildings Own, occupy, and only develop assets that are net zero carbon in operation by 2030. |
| | Toronto | |
| | Vancouver | |

Note: Other notable major cities in APAC including Beijing, Shanghai, Singapore or Seoul have not openly committed the C40 signatories possibly due to prioritization of the city’s own local or national policies to promote sustainable building practices.
 Source: C40 Cities. As of April 2023.

In Australia, building sustainability certification has been used to disclose the performance of existing buildings and enforce performance requirements. Recently, the National Australian Built Environment Rating System (NABERS) for emissions factors, announced changes that buildings that still use a high proportion of gas will see a reduction in NABERS Energy star ratings by 2025.

In addition, accessing green financing in Australia would require buildings to achieve at least 30% of emissions reduction or at least 4.0 stars NABERS energy rating within five years.² With government tenants in Australia requiring a minimum of 4.5-star NABERS energy rating out of the maximum 6.0 star rating for all the buildings that they occupy, enhancing the buildings performance remains imperative.

In Singapore, existing buildings will need to meet higher minimum energy efficiency levels or building energy performance to be certified green under the new BCA Green Mark 2021. Starting from 2022 onwards, the minimum energy savings improvement will be raised from 25% to 40% compared to 2005 levels.

On the financing front, major banks in Singapore have committed to limit new loans for polluting sectors including upstream oil and gas as well as coal. While not legislated, banks could potentially conduct more rigorous due diligence when financing buildings with these types of tenants.

From 2025 onwards, conformity to energy conservation standards in Japan under the Building Energy Efficiency Act currently limited to non-residential buildings with a floor area of 300 square meters or more, will be mandatory for all new residential and non-residential buildings. In addition, the use of renewable energy will be made compulsory in Tokyo including installation of solar panels for new houses.

Incorporating onsite instalment of renewable energy will also become necessary in cities such as Seoul, where solar power on new buildings is required from 2023 onwards. In addition, under the Seoul Environmental Assessment Standards and Green Building Code, the installation of solar photovoltaic (PV) systems will be essential for all public buildings. The Seoul Metropolitan Government has also mandated a Zero Energy Buildings (ZEB) standard for new building with gross floor area (GFA) of more than 100,000 sqm.

International Energy Efficiency Scorecard

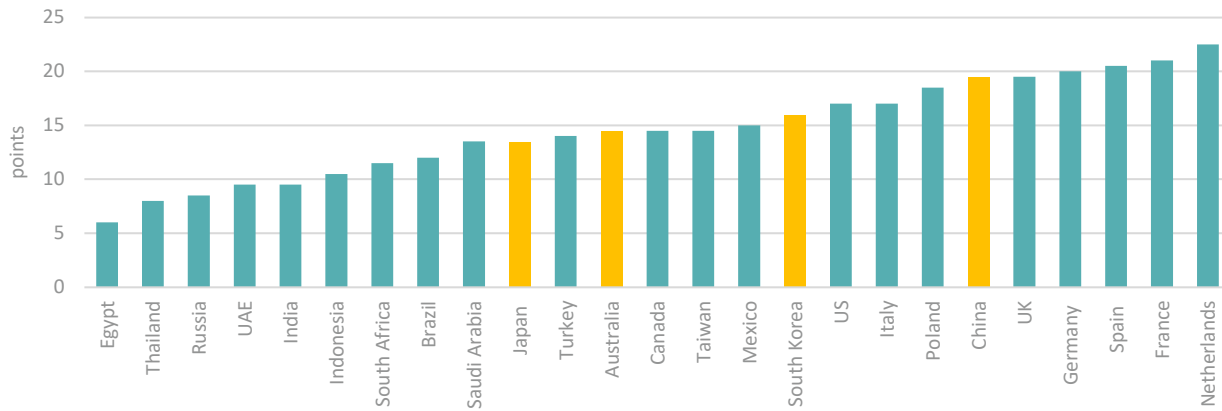
In the 2022 International Energy Efficiency Scorecard report which evaluated each country's energy efficiency policies and energy intensity metrics for residential and commercial buildings showed that Netherlands continued to lead the buildings sector with a score of 22.5 points out of 25 points (Exhibit 3).

Major countries in Asia Pacific including China have gained a total of 19.5 points due to its comprehensive implementation of appliance standards and labeling program and mandatory building energy codes for new houses and public buildings. South Korea which ranked 10th in the building sector scorecard fared favorably on the building retrofit policies under the Seoul's Building Retrofit Program which aims to encourage energy efficiency refurbishments for government, commercial and residential buildings. Australia was the strongest for its comprehensive policies to address its commercial buildings energy use while Japan continued to receive credits for its requirement to submit energy savings plans when undertaking large renovations.

² NABERS (2022) NABERS Sustainable Finance Criteria

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Exhibit 3: International Energy Efficiency Policy and Performance Scorecard in the Building Sector (2022)



Source: Source: www.aceee.org. As of April 2023.

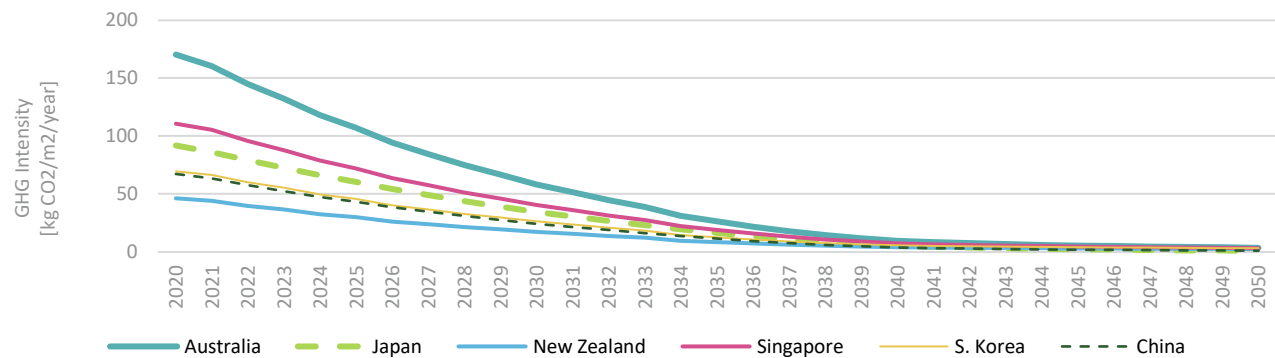
Carbon Risk Real Estate Monitor (CRREM)

The CRREM tool is widely used by investors and banks to benchmark current and future performance of real estate assets. It is developed from a ‘top down’ approach based on national carbon targets and is the only scheme that has nuanced net zero targets for different locations and asset types. The pathway aims to align with the requirements of the Paris Agreement to limit global warming to a maximum of 1.5°C through the reduction of carbon emissions by 45% in 2030 and achieving net zero by 2050 (Exhibit 4).

The CRREM tool is widely used by investors to benchmark current and future performance of the real estate asset. For example, in the office sector, the pathway suggests that GHG intensity will need to be reduced by more than half from 2020 to 2030 and will be steeper going forward in order to meet the 2050 targets.

Achieving Net Zero Carbon in real estate while partly depends on the efforts of real estate owners, it is also significantly influenced by the electricity generation energy mix of each country. Governments are expected to continue to play a pivotal role in decarbonizing the energy grid which real estate owners have little direct control. Eventually, the power grid will need to evolve in which renewable energy generation will play a more important role in the future.

Exhibit 4: 1.5°C Decarbonisation Target Pathways for Office Buildings

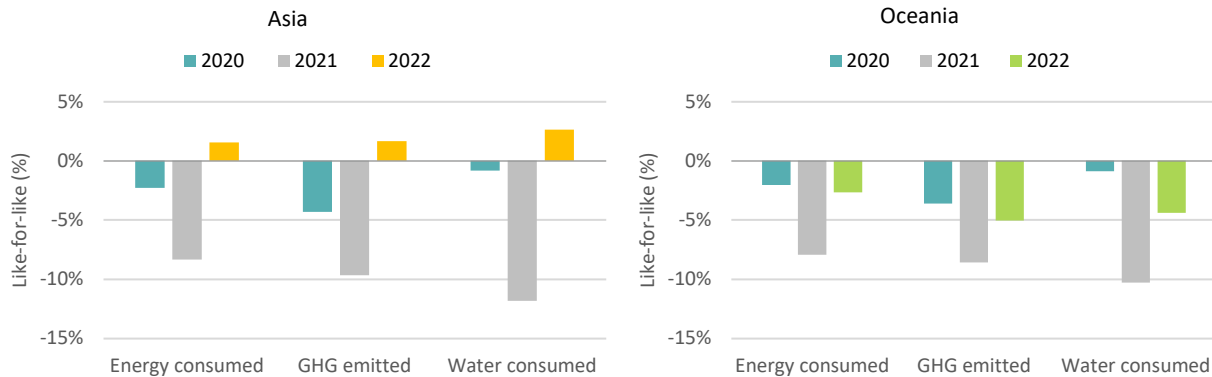


Source: Carbon Risk Real Estate Monitor (CRREM). As of April 2023.

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Energy monitoring and building audits are essential requirements in delivery more efficient buildings and these are being measured by the Global Real Estate Sustainability Benchmark (GRESB). In 2022, the GRESB results indicated that significant improvements are required to achieve net zero targets. In particular, the return to pre-pandemic state of operations in the Asia region has seen an increase across the benchmark including energy and water consumption as well as greenhouse gas (GHG) emissions (Exhibit 5). On the other hand, the Oceania region which includes Australia and New Zealand are the only countries globally that have continued to see reductions across all metrics despite the reopening of the economy.

Exhibit 5: 2022 GRESB Real Estate Results Asia and Oceania (% Annual Change)

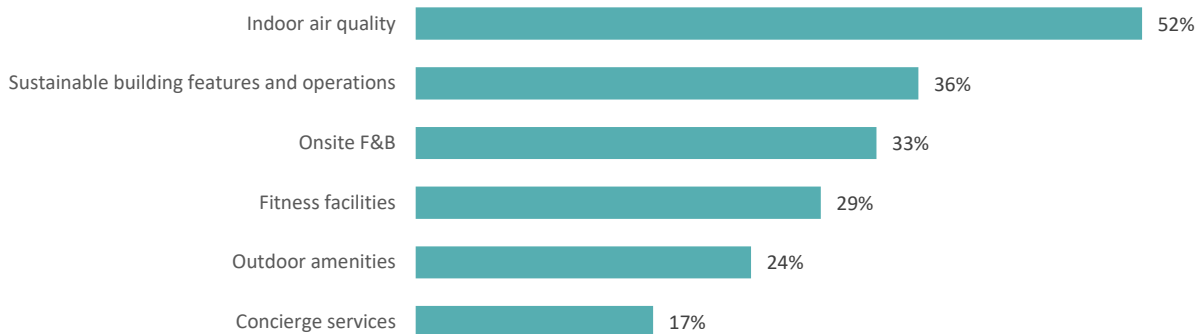


Source: GRESB. As of April 2023.

Indoor Air Quality

Apart from energy monitoring, health and wellness of employees have also been a top priority for occupiers post pandemic primarily good indoor air quality and the need to reduce airborne infections and pollutants. As highlighted by the 2023 Honeywell Healthy Buildings Survey, over 93% of the surveyed employees had higher expectations for indoor air quality in their workplace than they did three years ago.³ Occupiers have also ranked indoor air quality as their top priority for workplace well-being, well ahead of fitness facilities and onsite F&B (Exhibit 6). Given the greater emphasis on health and wellness, real estate owners could expect to see more focus on asset level data including performance on indoor air quality.

Exhibit 6: Most Sought-After Wellness, Sustainability and Community Building Attributes (2022)



Source: CBRE Spring 2022 Asia Pacific Occupier Survey. As of April 2023.

³ Honeywell (2023) <https://www.honeywell.com/us/en/press/2023/02/honeywell-survey-reveals-increased-expectations-for-healthier-workplaces>

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Strategic investment implications to real estate

Notwithstanding the higher upfront costs associated with retrofitting buildings to reduce carbon emissions, tighter regulations on building standards and emissions have increased the risk associated with stranded assets. The focus on more sustainable buildings have seen the market becoming more bifurcated with better quality commercial buildings continuing to attract investors and occupiers alike albeit at the expense of inferior quality stock.

In terms of the investment strategy, tighter building efficiency standards as well as shift in occupier demand towards more sustainable buildings presents a clear opportunity to refurbish existing, well-located, grade B stock in markets with low vacancy.

Given the current price dislocation in the market, such stock could be acquired at a discounted price, and transformed into next generation space to meet investor and occupier needs, especially given the constrained pipeline of new supply. An active asset management approach could be taken including improving energy efficiency, air quality and investing in smart buildings technology to improve tenant retention and capture above market rental growth.

From an investor's perspective, aligning real estate investments with more sustainable building standards supports the needs of occupier's demand and reduces the risk of obsolescence while potentially increasing the liquidity of the real estate investments at exit.

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