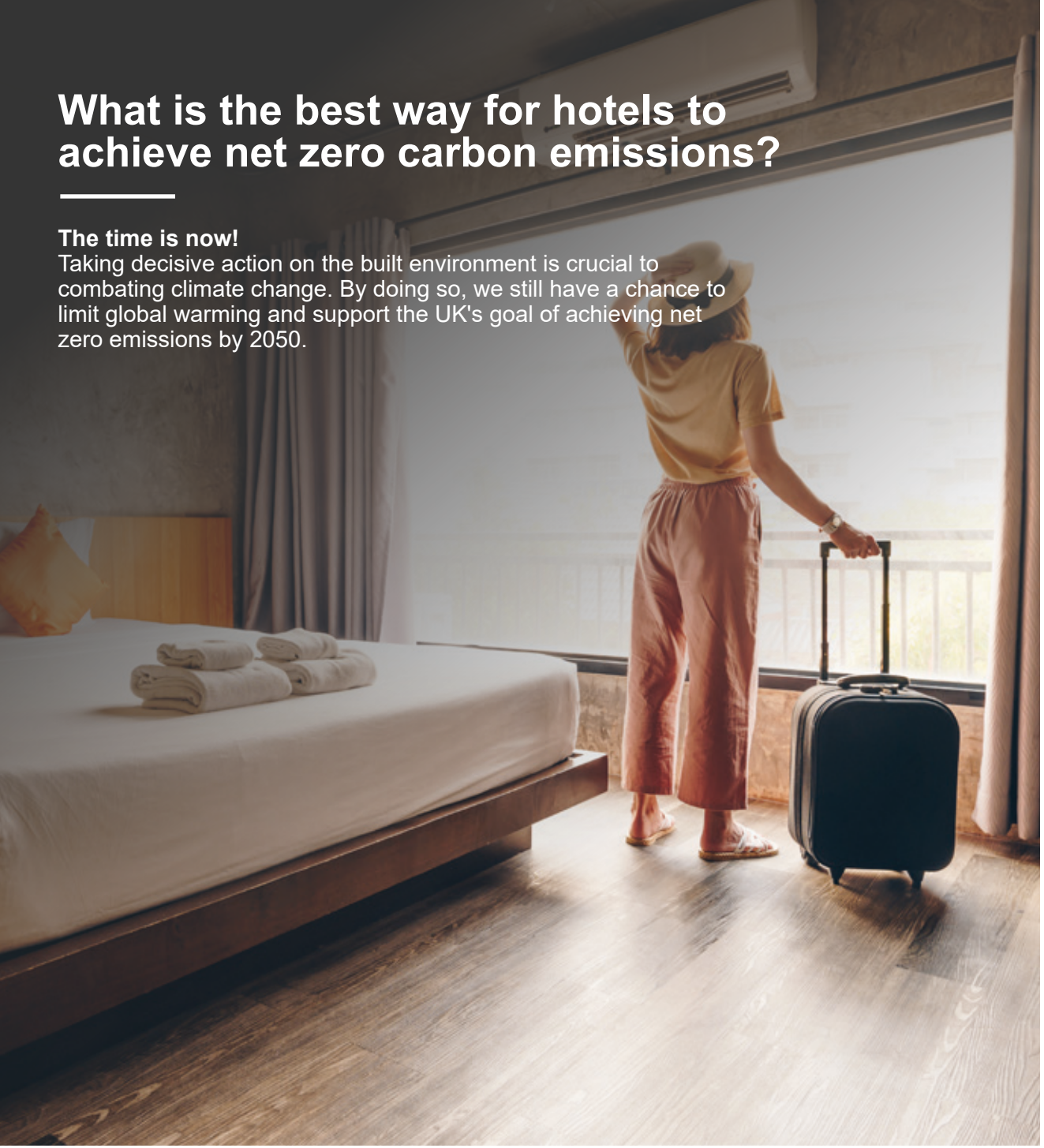
Currie & Brown

Revive & Thrive:

Decarbonising hotels for a sustainable future

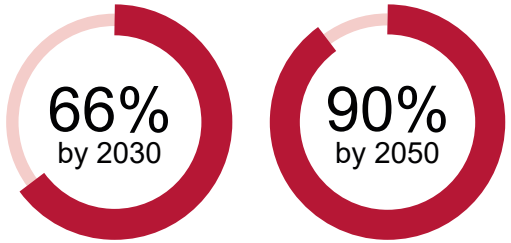
Analyse | Prioritise | Optimise | Realise

What is the best way for hotels to achieve net zero carbon emissions?



The time is now!
Taking decisive action on the built environment is crucial to combating climate change. By doing so, we still have a chance to limit global warming and support the UK's goal of achieving net zero emissions by 2050.

The challenge is not to be underestimated
Hotels needs to drastically cut their carbon footprint to reach net zero – **66%** per room by 2030 and **90%** by 2050.



Hotels have a crucial part to play
Here's what we know: approximately **80%** of the buildings that will be in use in 2050 already exist today. This includes hotels, which account for around **1%** of global carbon emissions according to the Sustainable Hospitality Alliance.

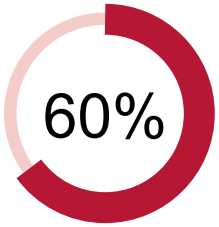
A significant figure, when you consider that occupied buildings are currently responsible for **39%** of global energy related carbon emissions. This is a critical opportunity for the hospitality industry to spearhead emission reduction in the travel and tourism sector.

In comparison to other commercial buildings, hotels are one of the highest energy consumers. If steps to decarbonise are not taken now, they risk becoming outdated and less valuable in the coming years. And the challenge is not to be underestimated. The industry needs to drastically cut its carbon footprint to avoid emissions growth alongside industry expansion.

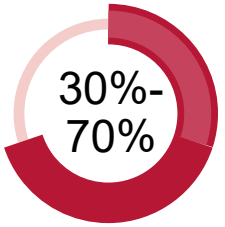
Driven by societal and organisational awareness, increased regulation as well as environmentally conscious travellers, investors and owners must now prioritise reducing the carbon footprint of hotels. Interventions to improve energy efficiency and decarbonisation efforts must be embedded into the next refurbishment cycle for hotels. Aligning to existing build cycles is the most cost-effective way to make improvements to building performance.

Demolish and rebuild, or reposition and improve what already exists?

Operational emissions
Energy costs consume **3-6%** of hotel budgets and create roughly **60%** of their carbon footprint



Embodied emissions
For hotels, embodied carbon can be substantial, accounting for **30-70%** of their entire lifecycle carbon footprint.



Whole life carbon
Achieving net zero carbon requires a holistic approach. This means considering all the emissions a hotel generates, not just its day-to-day operations. There's a balancing act between the carbon footprint of running a hotel (operational emissions) and the carbon footprint of building it (embodied emissions).

This starts with a key decision – what can we do here? Demolish and rebuild, or reposition and improve what already exists? While brand new hotels may be more energy efficient, their construction creates a significant amount of upfront carbon emissions.

Operational emissions
Hotels face a double challenge. Energy costs eat up **3-6%** of hotel budgets, and create roughly **60%** of their carbon footprint. Building new ultra-green hotels (those aiming for net zero carbon emissions) won't solve the problem fast enough. The key lies in existing hotels and the repositioning of other existing buildings into hotels.

Since heating/cooling, hot water, ventilation, and lighting are the biggest energy users in hotels, a different, more considered design approach is needed to reduce operational energy use.

But there is good news. Decarbonising your estate offers more than just environmental benefits. Using less energy not only results in lower consumption costs but also means you can install smaller, more efficient heating and cooling systems – releasing extra space for other uses. This also reduces wear and tear, extending their lifespan. Better energy control can also improve guest comfort by reducing noise from equipment and giving them more control over their environment. Happier guests can lead to higher revenue per available room (RevPAR).

Embodied emissions
Throughout a hotel's lifespan, embodied carbon goes beyond initial construction. Ongoing maintenance, refurbishments, and ultimately, demolition contribute to the building's embodied carbon footprint.

While operational carbon emission reduction through energy efficiency measures and purchasing renewable energy is crucial, a whole life carbon approach requires addressing embodied carbon.

This refers to the total greenhouse gas emissions associated with a building's material lifecycle, from extraction and processing to transportation, construction, and ultimately, demolition.

For hotels, embodied carbon can be substantial, accounting for **30-70%** of their entire lifecycle carbon footprint. This underlines the importance of integrating embodied carbon considerations into the development process.

Analyse

Establish a thorough understanding of your current energy usage by analysing your assets.

Analyse your assets

Updating an existing hotel or adaptive reuse of an existing building provides clear environmental and financial benefits through energy efficiency. In most instances, it is also far more cost-effective than demolishing an old asset and starting from scratch.

This approach preserves the time and resources that would be lost in the process of demolishing and redeveloping new buildings, along with the social, cultural and heritage value of those buildings.

Establish a baseline
Understanding your hotel's current energy use is crucial to charting a path towards net zero and boosting profit margins. Data from your primary energy meter provides a starting point, but for a more detailed picture, submeters on key areas and processes are recommended.

This comprehensive baseline unlocks valuable insights. You can compare your hotel's carbon footprint to similar ones, giving you a relative idea of your performance. It also reveals the gap you need to bridge to reach net zero, helping you set realistic goals. Additionally, this data can be used to calibrate energy models, allowing you to evaluate different improvement strategies and prioritise the ones with the biggest impact.

Understanding the current position allows you to explore the various refurbishment and retrofit options in detail, enabling the selection of the most effective and cost-efficient improvements.

Prioritise

Identify cost-effective solutions to transition to renewable energy sources and implement operational efficiencies that increase profitability.

Achieving operational net zero

1. Operational efficiencies
Maximising operational efficiency presents the most cost-effective and potentially the most straightforward approach to reducing a hotel's carbon footprint by avoiding capital expenditures on structural modifications or upgraded building services.

Optimisations can range from guest room booking strategies to HVAC scheduling – all contributing to a more sustainable operation.

2. Prioritise integrated systems
Modern guest room management systems (GRMS) offer a comprehensive view of each hotel room by integrating seamlessly with building management systems (BMS), property management systems (PMS), and other relevant technologies. This interconnected approach empowers hotel operators to optimise energy consumption through real-time monitoring and control.

Proactive maintenance, identification and resolution are also ultimately reducing operational costs and promoting a sustainable environment. Integration with PMS facilitates efficient service requests and remote troubleshooting, directly enhancing the guest experience with a more responsive and personalised stay.

Analyse your asset → **Prioritise** achieving operational net zero → **Optimise** your operations → **Realise** a world of benefits

Achieving operational net zero

3. Strategic room allocation
While guest preference and availability are key factors in room allocation, this approach often neglects energy optimisation. Consequently, lighting, heating and cooling systems run unnecessarily throughout entire guest room blocks, even in unoccupied areas.

By strategically allocating rooms together, significant operational benefits can be achieved that extend beyond guest preferences. This strategy offers several advantages including reduced energy consumption, enhanced staff efficiency and streamlined maintenance.

4. Improving the building envelope
Exploring strategies to leverage natural ventilation as well as optimising the facade to achieve a balance between maximising daylight, improving insulation and minimising infiltration rates can result in energy savings.

5. Heat recovery
Hotels generate a lot of waste heat from various sources like air conditioning (AC) units, kitchens and laundry facilities. Heat recovery systems can capture this waste heat and transfer it to a usable form, typically hot water, through heat exchangers.

The recovered hot water can then be used for various purposes in the hotel, such as for showers, sinks, and laundry. Heat recovery systems can significantly reduce the energy needed to maintain comfortable temperatures in pools and spas.

6. Transitioning to renewable energy sources
Hotels are increasingly looking to generate clean power and lessen their dependence on the traditional grid. Solar photovoltaic (PV) panels installed on rooftops capture the sun's energy and convert it to electricity.

This shift towards on-site renewable energy generation serves as a key strategy to fulfill a building’s remaining energy needs through clean, zero-carbon sources.”

Where on-site generation isn't practical, hotels should purchase electricity from 100% green tariffs that are REGO (Renewable Energy Guarantees Origin) backed, allowing them to offset their carbon footprint and support the development of clean energy sources.

7. Offsetting
As a last resort, carbon offsetting allows hotels owners and operators to compensate for unavoidable emissions (CO2e) by supporting projects that reduce greenhouse gases elsewhere. These projects can involve renewable energy, forest preservation, or other initiatives that demonstrably lower the overall amount of CO2e in the atmosphere.

Carbon offsetting is a valuable tool, but it should come after efforts to reduce emissions at the source. When considering offsets as part of a net zero strategy, transparency and environmental integrity are crucial. Look for accredited offset programs that ensure robust and measurable CO2e reductions.

When retrofit is not an option

We know that retrofit is not always possible and, in some cases, may not optimise economic, social, and sustainability benefits. This is particularly true for buildings lacking robust structures and foundations, large floor plates and flexible layouts. In such cases, deconstruction and redevelopment are necessary to create modern net zero buildings.

Whether new build or refurbishment, the project should adopt circularity principles to minimise impacts from the materials used. Targets for embodied carbon should be established from the outset and lifecycle carbon assessments carried out to inform the design.

1. Minimise embodied carbon
Circular economy principles can significantly reduce embodied carbon emissions in new buildings.

This involves designing for longevity and adaptability to avoid frequent reconstruction, prioritising recycled or reused materials to minimise demand for virgin resources, planning for disassembly to facilitate future reuse, and using life cycle assessments to identify low-carbon options throughout a building's life span.

By implementing these strategies, new buildings can become part of a closed-loop system that minimises waste and keeps embodied carbon within the construction cycle.

2. Focus on low-carbon materials
Conduct a lifecycle carbon assessment (LCA) to identify the high embodied carbon materials and identify opportunities to reduce these impacts through low carbon design and material selection.

For example, specifying higher recycled content steel or lower carbon concrete. By increasing the GGBS (Ground Granulated Blast-furnace Slag) mix to 75% a project could achieve embodied carbon savings of up to 40% for concrete.

3. Design for efficiency
Modern Methods of Construction (MMC) can play a significant role in reducing emissions and waste throughout the construction process.

By manufacturing the building components in a controlled factory setting, this process can optimise material use and enable better control over materials. This in turn can translate to less on-site waste and emissions and the opportunity to recycle or reuse offcuts more effectively.

MMC can also help reduce carbon expended on transporting material and personnel to the building site by manufacturing components off-site, reducing on-site traffic and pollution.

Optimise

Leverage advanced technology and sustainable materials to improve both energy efficiency and the overall guest experience.

> Hotels in heritage properties call for a bespoke and imaginative approach to decarbonisation. This should be based upon an analytical building audit of the practicality, cost and benefit of potential interventions.
>
> Often this building scenario requires highly targeted interventions determined by what is possible in a constrained environment.

Richard Hill
director, cost management, Currie & Brown

Optimise your operations

Avoid early depreciation in a changing market: Develop a plan to significantly reduce your carbon footprint while maximising value for your asset. This roadmap will guide your investment decisions for years to come, ensuring you successfully optimise your existing assets.

A comprehensive review of the building controls strategy is paramount to realising operational efficiencies. In conference or other communal spaces, CO^2 sensors can deliver savings by co-ordinating fan speeds with occupancy.

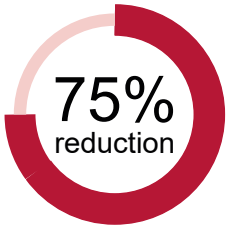
Other useful measures might include introduction of entrance air locks, full use of LED light fittings, and an overhaul of lifts to upgrade lift drives and in-car lighting, as well as measures to reduce hot water consumption such as wastewater heat recovery or high-performance shower heads. An on-going monthly energy monitoring and building tuning program would also have great benefit accompanied by an Automated Fault Diagnostics platform.

Cost effective improvements
Drawing upon recent high level data analysis into energy efficiency improvements in commercial property, undertaken by Currie & Brown on behalf of the Investment Property Forum (IPF), it is conceivable that a substantial package of improvement measures similar to these could reduce an existing hotels carbon intensity by up to 75% (measured as $kgCO^2/m^2/year$).

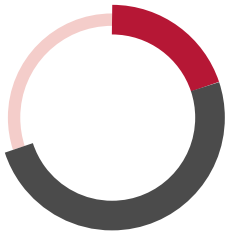
Depending on the size and complexity of the building, and the scale of interventions possible, the capital cost of improvements could be in the range of £300 - £800/m^2 GIA (Gross Internal Area).

In our study, we found that by applying a significant package of improvements, including amongst other measures new LED lighting and controls, ASHPs (air-source heat pump), and new mechanical ventilation with heat recovery, a 4,500m^2 building in multiple occupation, with an existing EPC rating of D was able to reduce its carbon intensity from approximately 60-70$kgCO^2/m^2/year$, to around 15-20 $kgCO^2/m^2/year$.

Meaningful reductions
A substantial package of improvement measures could reduce an existing hotel's carbon intensity by **up to 75%**. ($kgCO^2/m^2/year$).



Reduced emissions
Applying a significant package of improvements can reduce carbon intensity from approximately **60-70$kgCO^2/m^2/year$**, to around **15-20 $kgCO^2/m^2/year$.**



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We are net zero carbon advocates
The imperative for sustainable development necessitates a focus on innovative solutions. Our team is spearheading advancements in zero carbon building practices, particularly for hotel and commercial clients. For example, we're contributing to the development of guidance through organisations like the UK Green Building Council and LETI.

However, we realise this is merely the first step. Only by fostering a collaborative environment, working alongside national, regional, and local governments throughout the UK – can we translate our research and knowledge into actionable strategies, paving the way for a zero-carbon future.

Impactful interventions
Decarbonise your property: Many of the hotel projects we work on are in heritage buildings or sensitive locations.

To maximise efficiency in your hotel, begin with a comprehensive building audit to assess the viability, cost-effectiveness, and benefits of potential solutions. This targeted approach ensures interventions maximise efficiency while preserving your property's structural and aesthetic character.

For example, external wall and roof level insulation is effective provided it does not prejudice appearance or disproportionately reduce floor area if applied internally.

Secondary glazing upgrades are often favoured over replacement, but where replacement is possible, bespoke sections may need to be designed. For example, heritage vacuum glazing is expensive but is high performance and looks like single glazing.

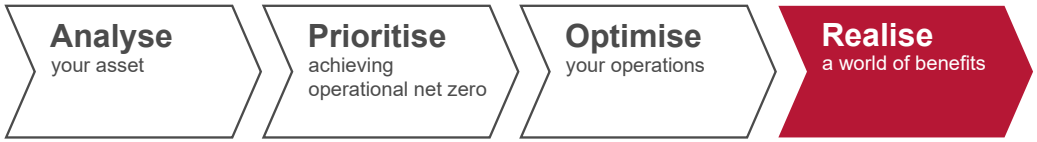
Other targeted interventions can significantly improve air tightness and reduce thermal bridging delivering significant savings in heating / cooling load without necessitating major works.

Services interventions with a proven record of cost-effective benefit include upgrades to chillers and fan coil units with heat recovery, introduction of heat pumps, and the resizing of pipes and ducts to reduce pressure losses.

The services we provide encompass the full spectrum of built environment services – strategy, design, construction, and handover – delivering maximum value, mitigating risk, and guaranteeing performance for your project.

Realise

Embrace significant operational cost savings, enhanced guest comfort, and reduced environmental impact.



Realise a world of benefits

Net zero and carbon positive buildings are the future and their benefits go beyond simply reducing emissions – they represent a paradigm shift. By prioritising energy efficiency and integrating renewable sources, these buildings become on-site power generators, reducing greenhouse gases and operational emissions.

For hotel and commercial clients, net zero and carbon positive construction offer a world of financial benefits. By optimising energy efficiency, net zero buildings can significantly reduce operating costs.

But the benefits extend far beyond the bottom line. Imagine a building that breathes clean air, optimises thermal comfort, and fosters a healthier, more productive environment. That's the reality of net zero and carbon positive construction. Net zero buildings are also built to last, requiring less maintenance and minimising the need for demolition and resource-intensive new construction.

In short, it’s a win-win: a net zero hotel not only reduces your operating costs, but also delivers a superior experience for your guests and creates a healthier environment for everyone.

This isn't just about meeting 2050 decarbonisation targets; it's about creating a future where buildings work in harmony with the environment and their occupants.

> “We’re collaborating with a hotel owner and operator in central London, where the property is undergoing significant refurbishment. Due to various constraints, low-carbon initiatives cannot be implemented currently.
>
> Utilising our expertise in low-carbon solutions, we are future-proofing the development. This approach ensures that any current work will not require redoing when the client is ready to implement sustainable initiatives.

Eren Hourshid
Director, MEP cost management, Currie & Brown

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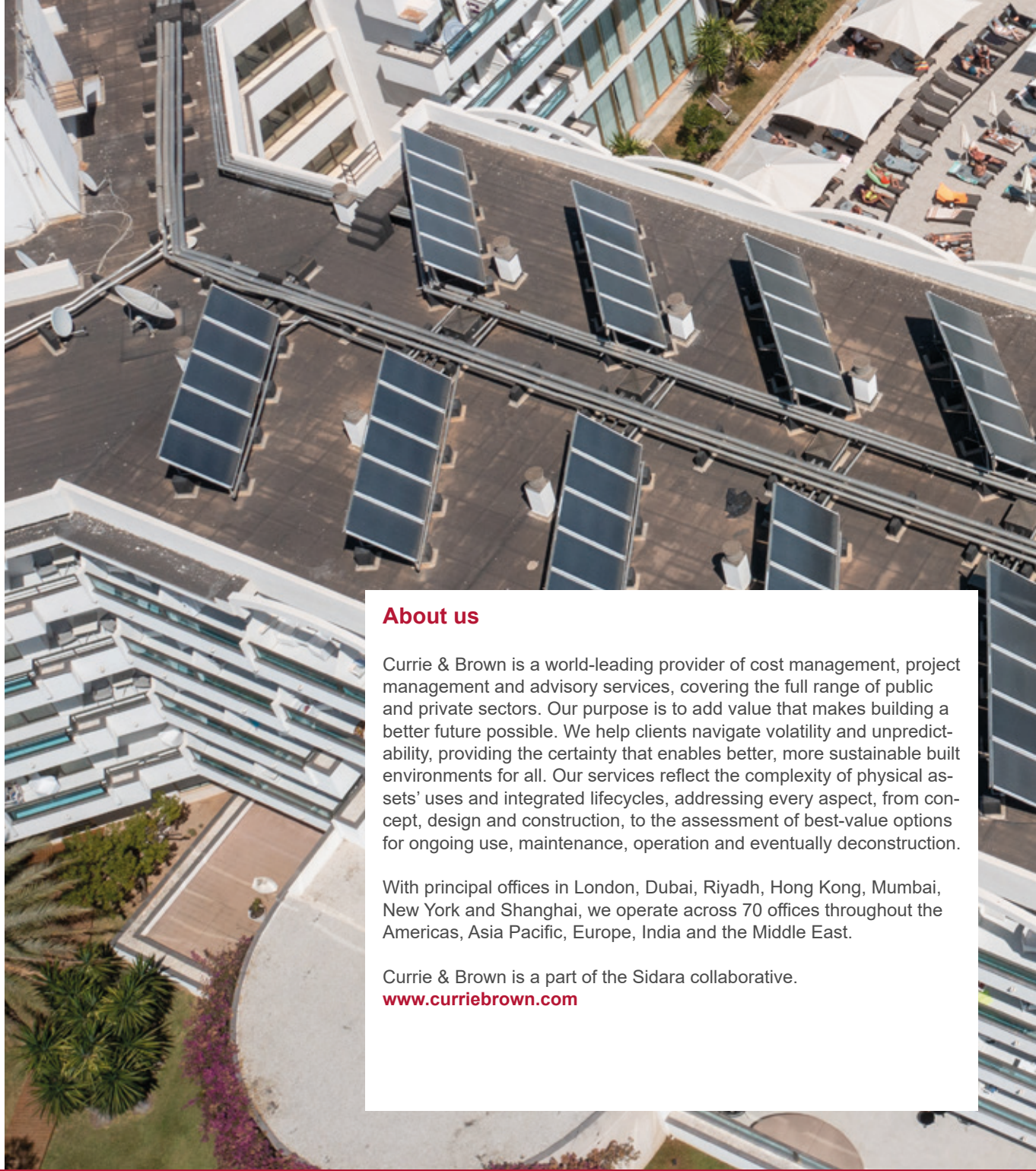

About us

Currie & Brown is a world-leading provider of cost management, project management and advisory services, covering the full range of public and private sectors. Our purpose is to add value that makes building a better future possible. We help clients navigate volatility and unpredictability, providing the certainty that enables better, more sustainable built environments for all. Our services reflect the complexity of physical assets' uses and integrated lifecycles, addressing every aspect, from concept, design and construction, to the assessment of best-value options for ongoing use, maintenance, operation and eventually deconstruction.

With principal offices in London, Dubai, Riyadh, Hong Kong, Mumbai, New York and Shanghai, we operate across 70 offices throughout the Americas, Asia Pacific, Europe, India and the Middle East.

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