



The Trillion-Dollar Opportunity

Unleashing the potential of existing buildings

CUNDALL

Our purpose

Cundall exists to create:

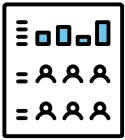
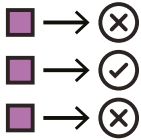
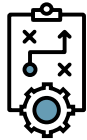
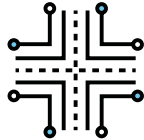
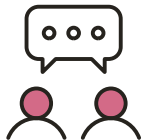
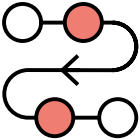
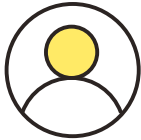
The best opportunities for our people
and sustainable solutions for the planet

Cundall is a global, independent, multi-disciplinary consultancy delivering sustainable engineering and design solutions across the built environment. Thought leadership is a key element of our business.

Innovation isn't about being different for the sake of it,
but being different when the project requires it.

Contents

Our Trillion-Dollar opportunities

Introduction	Where we are right now – a snapshot	Drivers for change	Understanding CRREM	Other risks	Where we start	Drawing the line on the page	Doing better with what we have
							
2	4	6	7	8	10	12	13
Snapshot: Vicinity	Snapshot: Centuria	When occupant needs change	Operating a building and improving operations	The role of smart building retrofits in improving operations	Tenants - how to engage them and bring them on the journey	Taking the heat out of the kitchen	What happens at end-of-life (spoiler, there IS no end of life)
							
14	15	16	17	18	20	21	22
Where to next?	What does success look like?	Acknowledgements					
							
24	26	28					

Introduction

In 2022 the world had a wake-up call, as heatwaves crippled Europe, months of flooding inundated Australian communities and typhoons caused major losses of lives and livelihoods across Asia. Climate change was no longer something to fear in the future, but something happening here and now.

The Intergovernmental Panel on Climate Change (IPCC) also released a Working Group report that identified improvements to existing buildings and existing urban communities as one of the most effective tactics for rapid emissions reductions to slow the escalation of climate change.

We recognise there is a major opportunity to improve human wellbeing, reduce energy cost pressures and to retain and enhance the buildings we already have so they can continue to serve us for generations to come.

The major obstacle for many owners and asset managers is knowing where to start, how to start and even in some cases, why they should make a start.

To address this, [Cundall Asia-Pacific hosted a webinar](#) featuring clients who have embarked on the journey of improving existing buildings. The ideas and insights contribute to the larger conversation we as engineers and sustainability consultants are having every day – how do we progress to net zero while leaving no community behind?



99 Mount Street, Sydney, Australia © Luc Remond

“

We have a goal for net zero carbon design by 2030. In short, that aspiration is to ensure that Cundall will only work on design projects that are zero carbon from 2030 onwards to be aligned with the 1.5 degree Paris agreement. But we recognise that a lot of our clients are at different stages of that journey, and we are there to help them along that journey.”

—
Oliver Grimaldi



Speakers for APAC World Green Building Week webinar



Oliver Grimaldi
Associate Director,
Sustainability Consultancy,
Cundall



Annie Scott
State Facilities Manager
(Western Australia), Centuria
Capital Ltd



Elaine Chan
Senior Clients & Marketing
Executive, Cundall



Gregory Kovacs
Design Director, Benoy



Dong Chen
Director, Asia Structures,
Cundall



Matea Čehovin
Sustainability Manager,
Vicinity Centres



Michelle Jagger
Principal Controls Engineer,
Cundall

Where we are right now – a snapshot

The IPCC 6th Synthesis Report released in March 2023 highlighted the progress many national and state governments have made towards establishing net zero targets and Nationally-Determined Contributions (NDCs) for greenhouse gas emissions reductions. While many of these targets are quite ambitious, the IPCC has noted that the continued increase in global emissions from the built environment, industry, agriculture, land-clearing and transport continues to out-pace the rate of reductions. In other words, we have a two-speed approach developing, where the impact of flagship abatement and mitigation projects is dwarfed by outputs of business-as-usual polluters.

Action to address adaptation and mitigation in Australia has been led at the local government level and the private sector, particularly through businesses embedding ESG (environment, social, governance) at the heart of their operations, planning and management of activities and assets.

Civil society is also taking a strong stance. We continue to see protests globally calling for urgent action on climate change. And it's not just the younger generation – it's all generations across the world.

According to the AR6 reportⁱⁱ, we are almost certainly headed for exceeding the 1.5 degree target this century, and if the current trajectory continues, might see average global temperature rises in the vicinity of four degrees in the following century. In addition, the current level of global warming is already causing major impacts on lives, communities, infrastructure and economic activity in the most exposed regions of Asia-Pacific.



“

We see examples of zero energy or zero-carbon buildings in almost all climates. Action in this decade is critical to capture the mitigation potential of buildings.”

—
IPCC Working Group III Co-Chair Jim Skea



“

80% of our built environment today will be existing and standing in 2050. That's a big problem that we currently have with regards to our built environment and zero carbon globally.”

—
Oliver Grimaldi

Fast facts from the IPCC 6th Synthesis Report

- In 2010-2019 average annual global greenhouse gas emissions were at their highest levels in human history, but the rate of growth has slowed.
- Without immediate and deep emissions reductions across all sectors, limiting global warming to 1.5°C is beyond reach.
- Since 2010, there have been sustained decreases of up to 85% in the costs of solar and wind energy and batteries.
- The energy sector transition requires substantial reduction in fossil fuel use, widespread electrification, improved energy efficiency, and use of alternative fuels (such as hydrogen).
- Reducing emissions in the industrial sector will require using materials more efficiently, reusing and recycling products and minimising waste.
- Current financial flows are a factor of three to six times lower than levels needed by 2030 to limit warming to below 2°C - but there is sufficient global capital and liquidity to close investment gaps.

Fast facts on energy efficiency

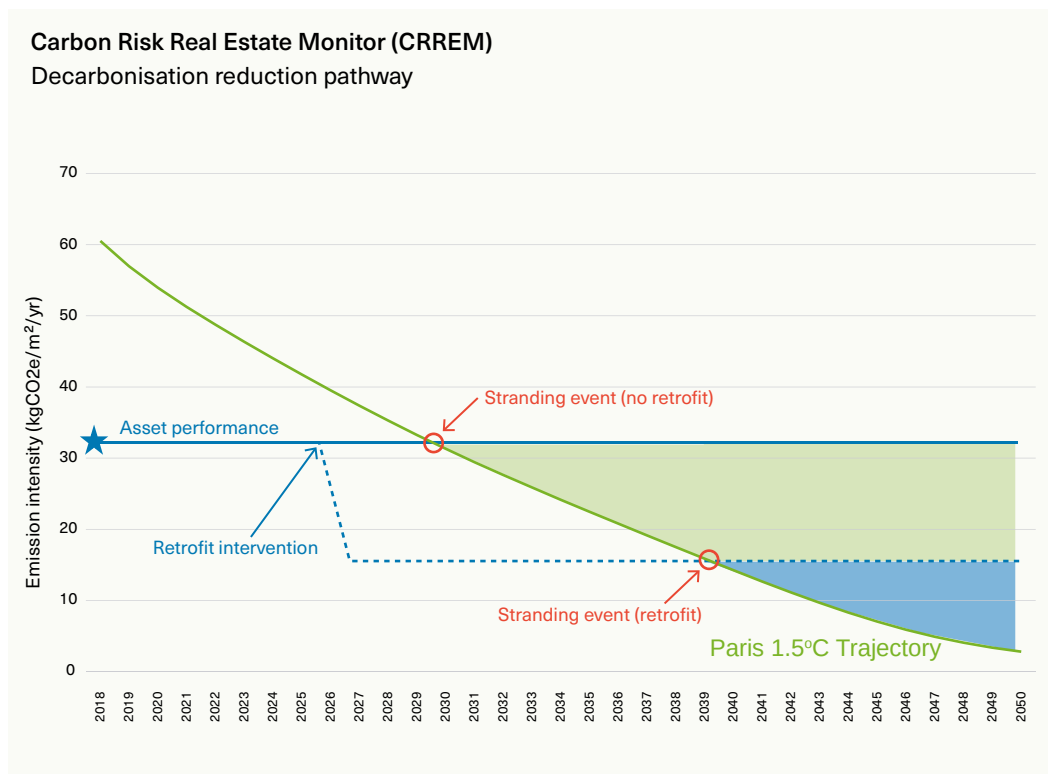
- Between the launch of NABERS in Australia in 1998 and the start of 2022, commercial building owners who have used the tool to audit and improve the energy efficiency of their assets have saved an estimated AU\$1 billion in operational energy costs.ⁱⁱⁱ
- These owners have also collectively abated [reduced] greenhouse gas emissions from the property sector by more than 7 million tonnes during the period 1998-2022.
- In 2018, the Global Commission on the Economy and Climate found that bold climate action could deliver at least \$26 trillion in economic benefits through 2030.^{iv}

Drivers for change

Beyond the alarm bells raised by climate science, there are significant drivers emerging in the property market and finance sector that are incentivising decarbonisation, performance improvements and climate adaptation planning.

They include:

- Capital funds and lending bodies requiring investors to disclose carbon risk and broader Corporate Social Responsibility policies and progress.
- Greater emphasis on both technical and financial due diligence ahead of asset purchase to gain a clear picture of asset energy consumption and emissions footprints.
- Global commitments including the World Green Building Council Net Zero Carbon Buildings Commitment.
- Tenant demand for premises that match their own promises in relation to net zero targets and ESG.
- Peer leadership in GRESB, NABERS and other frameworks that provide clear market differentiators and have become signals of capital value and leasing competitiveness.
- The rise of CRREM – the Carbon Risk Real Estate Monitor, this has been used extensively in Europe and is now gaining traction in Asia-Pacific and North America.



UK Green Building Council, London, United Kingdom © Philip Vile

Understanding CRREM

The Carbon Risk Real Estate Monitor (CRREM) is a science-led approach to understanding and addressing the emissions footprint of the built environment. By combining the lens of science with the frameworks and analysis of finance and economics, CRREM aims to support emissions reductions aligned with the Paris Target at the portfolio scale.

CRREM has produced tools and resources that clearly explain the relationship between emissions performance and financial performance, including the potential for asset stranding.

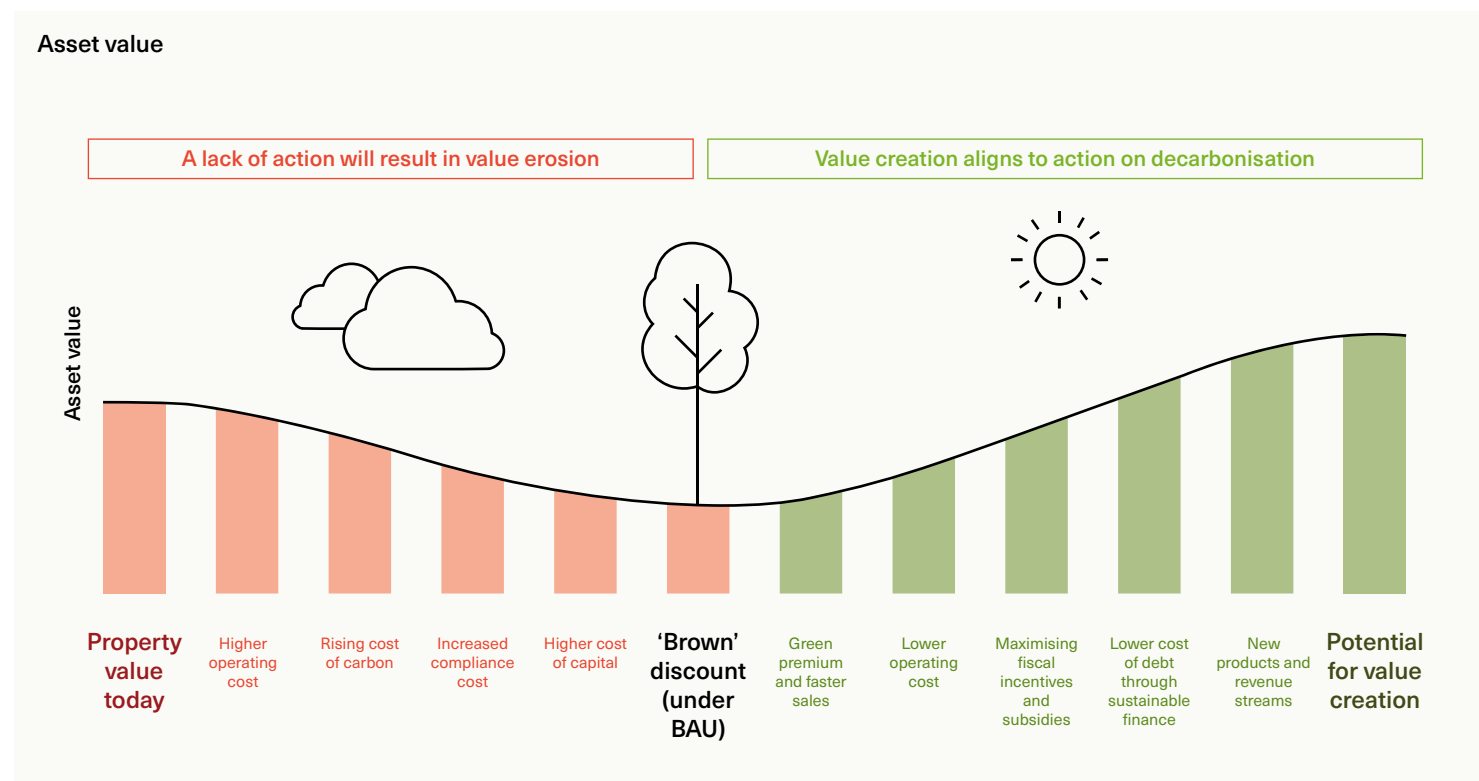
An asset stranding event occurs when the market shifts to align with net zero, leaving buildings that are emissions-intensive exposed to loss of capital value. This 'browning' of the asset can be avoided through a pathway of improvement including energy-efficiency upgrades and asset electrification.

The sooner retrofits and interventions occur, the less risk there is of the 'browning' of the asset.



Global real estate in terms of its assets is a huge, huge problem. The world's real estate is valued at \$326.5 trillion as of 2020 - and that's more than global equities and debt securities combined. And it needs to be net-zero carbon and currently isn't."

—
Oliver Grimaldi, Associate Director - Sustainability Consultancy



Other risks

In addition to asset stranding, there are other downsides to having a high-emissions, business-as-usual building:

- Higher operating costs for energy.
- Rising cost of carbon.
- Increased compliance costs to keep it operational, including insurance
- Higher cost of capital.
- The “brown discount” - the opposite of a green premium, where rents and sale value decrease compared to a high-performing and net zero buildings.

There's thankfully something we can do - we can make sustainable changes, and gain benefits including green premium and faster sales, lower operating costs, maximising fiscal incentives, lower cost of debt through sustainable financing and new products and revenue streams through sustainability.

We can take action, and increase the value of existing assets, instead of depreciating them.

“

“We don’t know how we’ll get there (to net zero) but let’s work in little chunks to get to that. Some people in sustainability are not seeing the trees for the forest, and some businesses are not seeing the forest for the trees. At Vicinity, we celebrate the little wins at the centre level as well as at the portfolio view. And we are conscious of celebrating the people behind them.”

—
Matea Čehovin



99 Mount Street, Sydney, Australia © Luc Remond

People often wonder, what do all the acronyms mean?



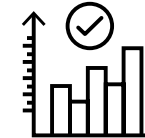
IPCC: The Intergovernmental Panel on Climate Change

The global coordinating body made up of scientists from around the world along with other experts that gathers evidence of and reports on climate science, climate risk, and pathways for adaptation, mitigation, sequestration and abatement of greenhouse gas emissions.



CO₂e: Carbon Dioxide equivalent

The Carbon Dioxide equivalent, shows the global warming potential (GWP) of any gas that is contributing to climate change and global heating by equating it to the GWP of an equivalent quantity of CO₂. A bit like oft-cited comparisons of 'equivalent to taking X number of cars off the road' or 'equivalent to ten Olympic swimming pools', but the math and atmospheric physics behind CO₂e is much more scientific!



BPS: Building Performance Services

A multidisciplinary engineering-led approach to improving the operational, financial and experiential aspects of a building through a series of interventions that begin with an audit of current performance, then a program of works to improve it, eliminate on-site gas use and achieve net zero building operations.



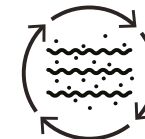
GRESB: Global Real Estate Sustainability Benchmarking

An annual reporting and ranking program that assesses the performance of real estate portfolios across key environmental, social and governance (ESG) indicators.



NABERS: National Built Environment Rating Scheme

Developed in Australia NABERS tools and ratings are used to assess sustainability performance, with specific ratings including NABERS Energy (Base Building, Whole Building or Tenancy); NABERS water, NABERS Waste and NABERS IEQ. NABERS for Energy has also been launched in the UK.



IEQ: Indoor Environment Quality

Includes thermal comfort, air quality, lighting, fresh air levels and occupant satisfaction. Initiatives such as increasing natural ventilation, improving daylight access, adding indoor plants and retrofitting smart systems such as occupancy sensors for lighting and HVAC can all improve IEQ and have benefits for human health and productivity.

Where we start

Unlike risk scenario planning when we do not have certainty around the outcome, with existing buildings we know exactly where we are heading – net zero, by 2050 or ideally sooner. We also know the basics of what is required.

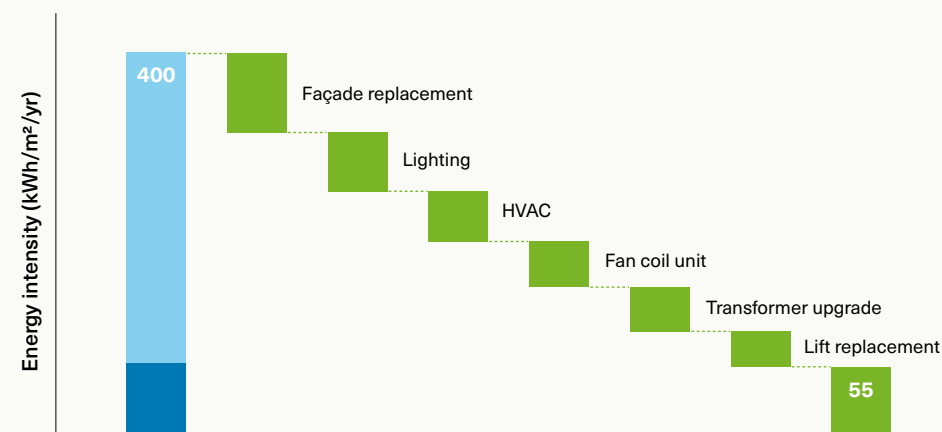
A necessary part of planning is to determine specific targets that are achievable in terms of energy intensity for a particular building and its function. For example, a data centre, retail centre or hospital is likely to require higher energy use per square metre even at its most efficient than a standard commercial office, multi-residential apartment, school classroom or logistics warehouse.

Then, once we know what the target is for energy – and we already know the target for emissions is zero – effective use of energy auditing and building systems and condition auditing lays the groundwork for making effective design, engineering and optimisation decisions.

Changes that may be made to a building include:

- Façade upgrade to improve passive thermal performance and/or introduce mixed-mode ventilation opportunities.
- Lighting upgrade to reduce operational energy, introduce zoning and daylight harvesting.
- Heating, ventilation and air conditioning (HVAC) upgrade including boiler replacement to switch from gas boiler to electric heat pump.
- BMS (building management system) upgrade and retrofit of smart controls for building services and systems.
- Lift replacement to retrofit regenerative drive technology or destination-controlled lifts.

Existing building - Net zero carbon pathway



“

Obviously, a lot of those interventions and changes need capital. They need cost, and we can actually map those out in an asset management plan that provides a working framework for progress towards net zero and the expected return on investment in operational energy cost savings and value uplift.”

—
Oliver Grimaldi



Interchange MSCP, Solihull, United Kingdom © Urban Growth Company

The seven steps to net zero in the built environment



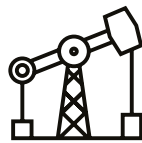
One

Start with passive design and optimisation.



Two

Reducing operational energy demand and consumption within a building.



Three

Eliminating fossil fuels completely - no natural gas, and trying to reduce or remove things like diesel, et cetera.



Four

Procure renewable energy, either on-site or off-site through green power purchase, et cetera.



Five

Focus on the embodied carbon – retain as much of an existing building as possible, minimise new materials use to minimise adding to embodied carbon.



Six

Take a whole life carbon approach in conjunction with the whole life costing of the building.



Seven

Publicly disclose and declare the sustainability credentials of your building.

Drawing the line on the page

One of the major positives of a new building is it is essentially less challenging for design teams. Given a blank page and a brief, there is greater flexibility than there is in adapting, retrofitting or repurposing an existing one.

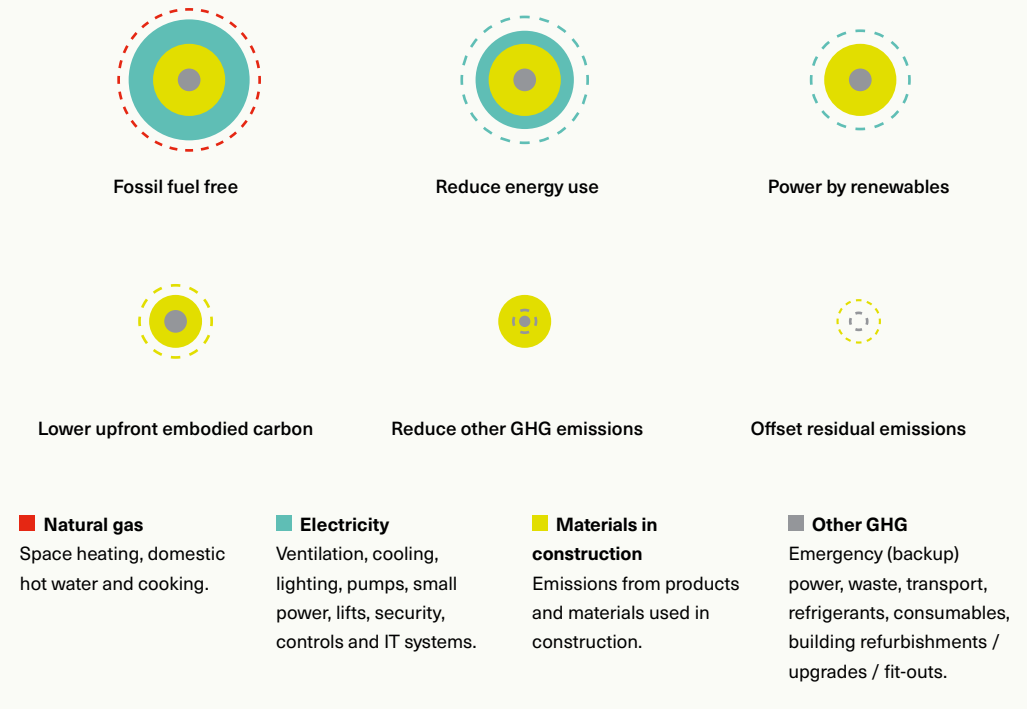
However, both the capital cost and the embodied carbon cost of a new build are far greater. Also, designers are essentially creating something for a future that is very much unknown. A building, for example, has a design life of 50 to 75 years minimum, infrastructure has an even longer design life of a century or more.

If we consider the substantial changes that have occurred just in the past 40 years – the rise of digital technology and nimble, flexible working; changes to retail

regulations allowing 24/7/365 trading in many jurisdictions; and the rapid rise in the number of women in the workplace - we can see that forecasting the needs of people two or three generations ahead of now is complex.

By comparison, in an existing building there is already a sense of what works, and what could be improved, and given the lower capital cost of upgrades to adapt to shifting market trends, technology or demographics, existing building projects are inherently lower risk.

Steps to achieve targets



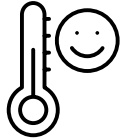
“

Before anything else, I think you have to have a look at becoming your own trendsetter. You don't have to wait for anyone else around you to just do something. The little steps are actually what matters. And I think from a building manager to a property manager to an investor to a tenant, everyone can just participate to assist in having your asset or the asset that you occupy not becoming a stranded one.”

—
Annie Scott

Doing better with what we have

Nested benefits of improving what we already have



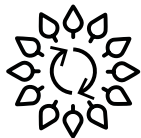
At the asset scale

Improved value, improved occupant comfort, reduced operational costs and future proofing.



At the neighbourhood scale

Retaining and improving the familiar urban fabric, respecting community attachments, addressing legacy issues including problems around safety, walkability, accessibility and amenity.



At the portfolio scale

Enhanced reputation, uplifts to capital values, demonstrable returns on investment through time and reduced regulatory carbon risk.



At the global scale

Reduced environmental impacts including biodiversity loss from new material extraction, reduced construction supply chain emissions and mitigation of built environment operational emissions.



Confidential retrofit project in Singapore

“

“We see retrofits as an ever-growing segment in the market... (and) we strongly believe that the most sustainable way of building, and it might sound strange from an architect, is actually not to build, so, reusing our existing underperforming building assets.”

—
Gregory Kovacs

Snapshot: Vicinity

Vicinity is exploring the potential for adapting a significant number of their shopping centre assets to more diverse, mixed-use precinct assets. This could entail the inclusion of a significant amount of commercial office space and multi-residential at the existing site – either by adding to the vertical real estate, or expanding the site footprint, or a mixture of both.

As part of this process, the team also recognises the opportunity to retrofit the existing retail centres and improve their energy-efficiency, remove on-site gas combustion plant and electrify, and install renewable energy generation on-site.

“

This would create truly multipurpose precincts. So, it is creating something new but it's also reusing the existing asset.”

—
Matea Čehovin



Snapshot: Centuria

Centuria holds a mix of asset classes including commercial office, industrial, health and retail buildings. This means Annie Scott and her team must tailor the approach for each asset to suit both the operational profile and variations of building form and context

Not every building type benefits from the same new technologies – health sector assets for example can benefit from smart building systems to a greater extent in terms of energy use intensity than industrial assets. However, industrial tends to have significant roof area for solar PV.

“

Our biggest challenge is around the retrofits on all our assets.”

—

Annie Scott



Centuria, Australia

When occupant needs change

There has been a noticeable shift in working patterns and commuting behaviour since early 2020. Fewer people attend commercial offices five days a week, and those that do are more likely than ever to cycle or catch public transport and walk the balance from the transport stop to the workplace.

This means many commercial buildings are over-supplied with basement car parking – so there is potentially a retrofit opportunity to gain greater value from what is essentially, extremely valuable and underutilised commercial real estate.

One successful retrofit intervention that is becoming popular and helping reposition older non-premium commercial assets is installing end-of-trip facilities for cyclists, high-quality amenities including accessible showers and change areas, and possibly wellbeing spaces such as yoga rooms.

Enhancing and embroidering the existing urban fabric also has benefits beyond the city fringe. When we ensure our buildings are being used for the greatest good, and find smart ways to provide for housing, employment, retail and recreation within the current urban footprint we slow or

halt the conversion of green spaces to gray places. This helps protect our food-growing capacity, water catchments, biodiversity and the natural amenity that almost every human appreciates.

Finding ways to repurpose parts of buildings that are empty to meet pressing needs such as living space for growing populations, being adaptive and using our foresight to think beyond the current financial year need to become fundamental to our asset management approach.



99 Mount Street, Sydney, Australia © Luc Remond

“

You want to have a workplace that is sustainable but also a community that you want to get up and go to every day.”

—

Annie Scott

Operating a building and improving operations

Retail assets as a class are generally at a very different point in the journey compared to commercial office buildings. NABERS and Green Star have both encouraged peer competition in the commercial property market, and tenants in those assets are also demanding sustainability credentials and features. This has been elevating the standard of energy efficiency. Retail lacks a similar momentum both from the tenant and the asset class perspective.

Retail assets as a class are generally at a very different point in the journey compared to commercial office buildings. NABERS and Green Star have both encouraged peer competition in the commercial property market and tenants in those assets are also demanding sustainability credentials and features. This has been elevating the standard of energy efficiency. Retail lacks a similar momentum both from the tenant and the asset class perspective.

This is however beginning to shift, as Vicinity is demonstrating with the NABERS and Green Star Performance ratings it has obtained for assets in its portfolio.

Some of the major retail tenants are also beginning to obtain Green Star certifications for their stores as part of the corporate social responsibility initiatives, and these brands find it an advantage if the retail centre they are looking to occupy also holds a sustainability certification.



“

Why I say there is a tsunami coming, we are getting more and more queries from our retailers - in particular at this stage brands with a national footprint - around sustainability and renewable energy and how we can help them in their sustainability journey, which also fundamentally helps us as well. So I think it's a place and a space to watch from a retail perspective compared to commercial which is pushing the boundaries already.”

—
Matea Čehovin

The role of smart building retrofits in improving operations

Asset owners who have committed to a net zero target and the required energy efficiency measures have found retrofitting smart building technologies is an essential tool in the kit for gaining visibility of building performance and improving building operations.

These technologies include:

- Energy monitoring systems that track how a building is performing and help to identify any assets within a portfolio that are not achieving the specified targets for energy use.
- Software-based analytics systems that use submetering, sensor and controls data to predict faults with systems before they cause major issues – this can often mean the difference between a maintenance task and needing to replace a system that reaches the point of failure.

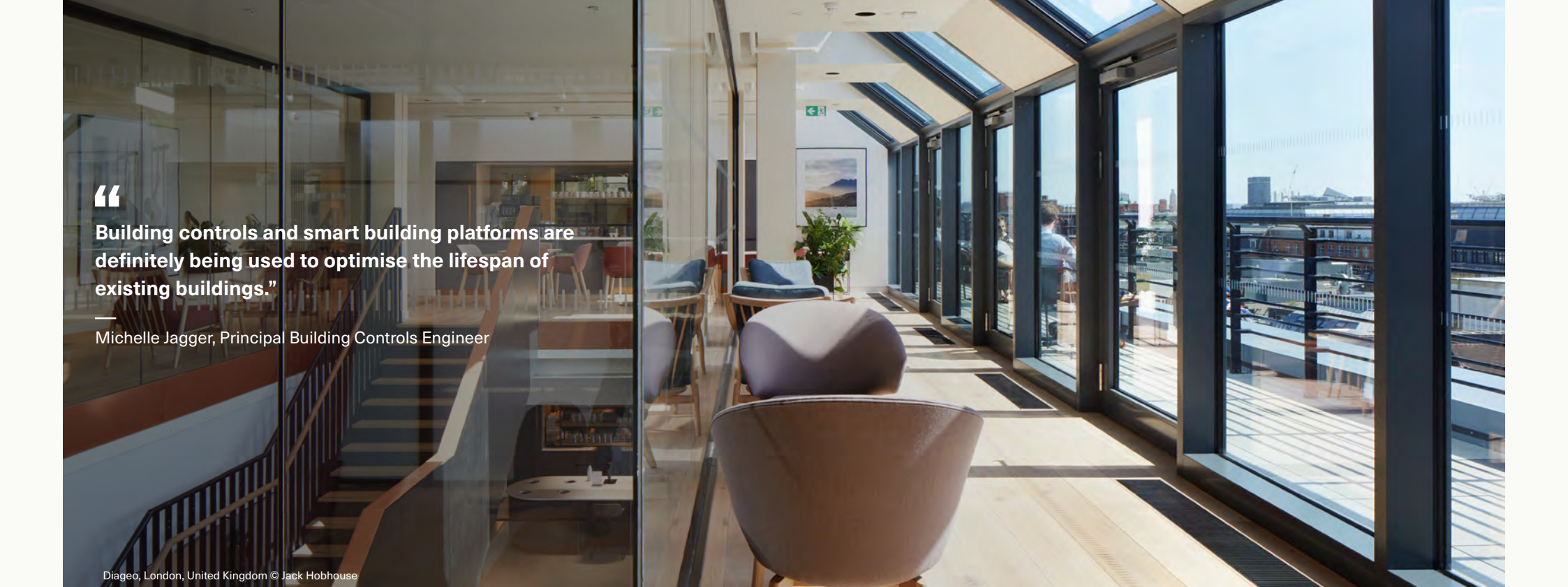
There are two main principles brought into play in determining what smart technologies would be best to retrofit:

- Improving the operational performance of the building including improving energy efficiency and monitoring and the performance of all the systems.
- The “value add” - how the occupant experience can be improved by using technology to give people enhanced access to what is available in the building, for example their booking systems connecting with all the facilities and functions in the building, which helps make workplaces more attractive and the building a more attractive place for people to spend time in.



480 Queen Street, Sydney, Australia © Scott Burrows

No building is too old to become smart – and smart buildings engineers and systems integration experts specialise in developing strategies for retrofits that ensure all the individual building systems can communicate with each other in an effective way.

A photograph of a modern office interior. On the left, there's a glass-enclosed staircase with a wooden handrail. In the center, a lounge area features several light-colored, rounded armchairs and a small round table. To the right, a long row of large windows provides a view of a city skyline. The floor is made of light-colored wood, and the ceiling has exposed ductwork and skylights.

“

Building controls and smart building platforms are definitely being used to optimise the lifespan of existing buildings.”

—
Michelle Jagger, Principal Building Controls Engineer

Diageo, London, United Kingdom © Jack Hobhouse

“

I think we need to understand that there's a bit of difference in between monitoring and optimising. You can't optimise without monitoring. And I think that's a very clear distinction that you need to just monitor what you've got, understand how assets are performing, understand how your HVAC is performing, and you'd be surprised at the cost savings.”

—
Annie Scott

Tenants - how to engage them and bring them on the journey

It used to be commercial properties were competing mostly with each other to recruit and retain quality tenants – but now both owners and the businesses who rent from them have to compete with an individual's own home.

The pivot to hybrid and remote working across the knowledge economy sector has made going into an office a choice, not a must, for a substantial number of people. This means both companies and premises need to be an attractive place to be.

Community is the incentive, according to Annie Scott. And community and sustainability can go hand-in-hand, as the tactics and initiatives that engage tenants in the sustainability journey can also create a sense of shared belonging.

In her team's mixed-use assets, the commercial tenants are now bringing the retail tenants along on the sustainability journey. Pressure from the organisations with strong internal targets for emissions and energy acts on both landlord and on other occupants to drive higher standards.

For the landlord, this is a clear plus, as they do not need to convince those tenants money should be invested in improving performance of the asset. This benefit flows on for the building operations team – smoothing the path for necessary conversations and negotiations – and also to the key stakeholder group of property fund investors.

Even before some organisations sign on for new premises, they are beginning to wield their influence to request – and receive – a higher standard of space in terms of green certifications.



Taking the heat out of the kitchen

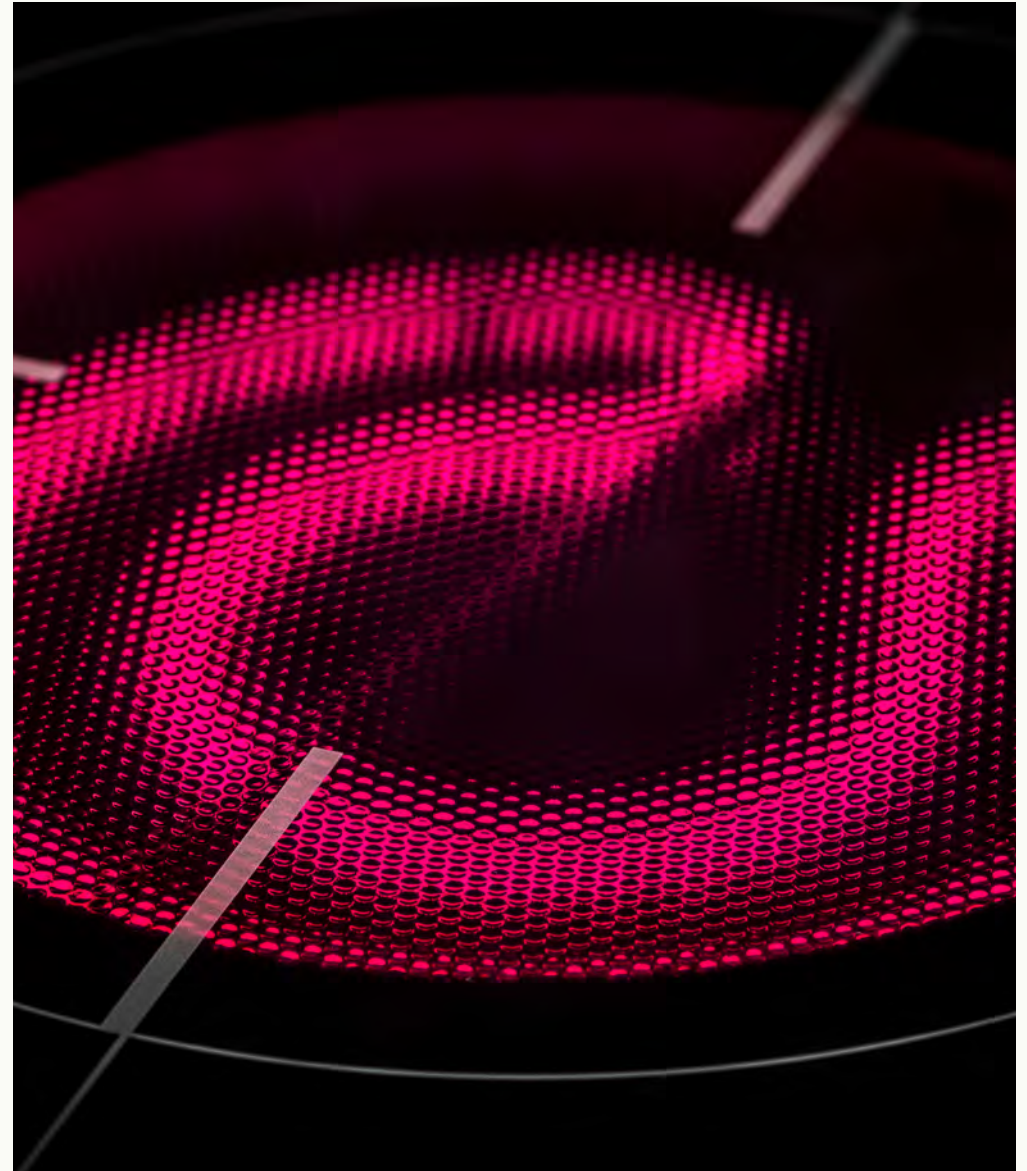
One of the most challenging conversations for retail asset owners is the burning issue of on-site gas combustion for kitchens for food and beverage vendors. The switch from gas to all-electric is fundamental for achieving net zero, yet induction cooking is still new to the market and there can be a tangible reluctance on the part of catering operators to embrace the approach and change their equipment specifications.

By taking the conversation to a deeper level and explaining the broader benefits of induction, including improved worker health and safety in the kitchen, the reluctance is starting to ebb. There is also a new generation of chefs and cooks coming into the sector that have been trained on all-electric, and these talented culinary experts generally have no appetite for going back to over-heated gas-burning methods with all the attendant risks of burns and spot fires.

“

What I find positive about the tenant demand is that we are working together. And then obviously, we are forming stronger bonds with our tenant by saying, ‘Okay, let us have a look, see what’s feasible.’

—
Annie Scott



What happens at end-of-life (spoiler, there IS no end of life)

It almost seems counter-intuitive to speak of 'end-of-life' for a building given how our cultures cherish built heritage from the relics of Rome and temples in Asia through to convict-hewn sandstone structures in Sydney.

But it is a familiar term to building managers and facilities managers, as all equipment has a design-life and therefore, all equipment comes with a future waste issue. For major plant such as entire HVAC systems or structural components such as façade assemblies, the cost of replacement and the logistical challenges associated with it can tip the balance toward a knock-down rebuild or significant gutting and redevelopment approach.

This thinking needs to change. The question needs to become, how can we upgrade, repair or retrofit to extend life and minimise waste and churn? And if we can't make it last longer, how can we ensure the equipment or materials are productively repurposed?

Embedding ESG (environment, social and governance) into design, delivery and operations and maintenance is an enabler of stewardship. That means knowing what's going into a building, ensuring it is used to its maximum potential, and planning for the whole lifecycle.



First Sentier Investors Fit-out, Sydney, Australia © Tyrone Branigan

“

To imagine you did something 50 years ago that can still be suitable for the tenant during that entire 50 years is an enormous challenge for a design team.”

—
Dong Chen

“

It's about having a look at how end-of-life can be... a renewal of life rather than end-of-life. Start by changing your vocabulary. That's an easy one, right?”

—
Matea Čehovin

Diageo, London, United Kingdom © Jack Hobhouse

Where to next?

Business as usual got us where we are right now, with global heating escalating and the toll on human lives and the wider environment rising. Therefore, like-for-like replacements of plant and equipment, and standard approaches to design of the building envelope may not be fit for purpose in the years ahead.

Design for retrofit needs to ensure it embeds climate resilience – minimising the impact of heatwaves, humidity, drought, bushfire, flood and severe storms. The finance team needs to be part of that conversation, because there is a business case here that investments in preparation and planning will always be a better option than the costs of repair, restoration and recovery after a disaster event.

In addition, codes and standards are constantly changing – in most cases to require improvements in energy performance, safety and emissions reductions. As we said at the outset, we know the goal is net zero and we are seeing regulations signal that in coming years it will not be an optional credential, it will be a requirement of doing business.

Equally, in many parts of the world building code standards are beginning to become more rigorous in terms of resilience to climate impacts and minimising the risk of loss of lives or property.



“

Most of the design codes are established based on experience from the past. Imagine if we use the knowledge from the past to handle the future problems. I also think it's key that we provide flexibility for the unknown. We try to design for what we expect and use our best kind of judgment for that, but we leave room for the unknown”

—
Dong Chen

“

It's not just about retrofitting for net zero but also retrofitting for climate resilience. Because yes, we're trying to achieve net zero so we limit the impact of climate change but there's changes already locked in, and more changes will come.”

—
Matea Čehovin

Designing and managing our existing buildings now for the future we know is coming is about being pragmatic – and responsible. Some of the ways we can do this include:

- Looking at adaptive re-use and retrofit projects as an opportunity to introduce more flexibility into floor plates and building systems, so as tastes or market needs change, spaces can respond with minimal need for materials churn.
- Designing for mixed-use, with fluid separation between retail and commercial, public and private.
- Implementing the latest scientific research into planning, design and operations to ensure parameters at the system and the building level are fit for future challenges.
- Think high performance, not just minimum compliance, when it comes to codes and standards.
- Keep in mind the universals – human needs for connection, belonging and security will not change – our spaces and places need to provide that.

Energy Pods, United Kingdom © Atkins

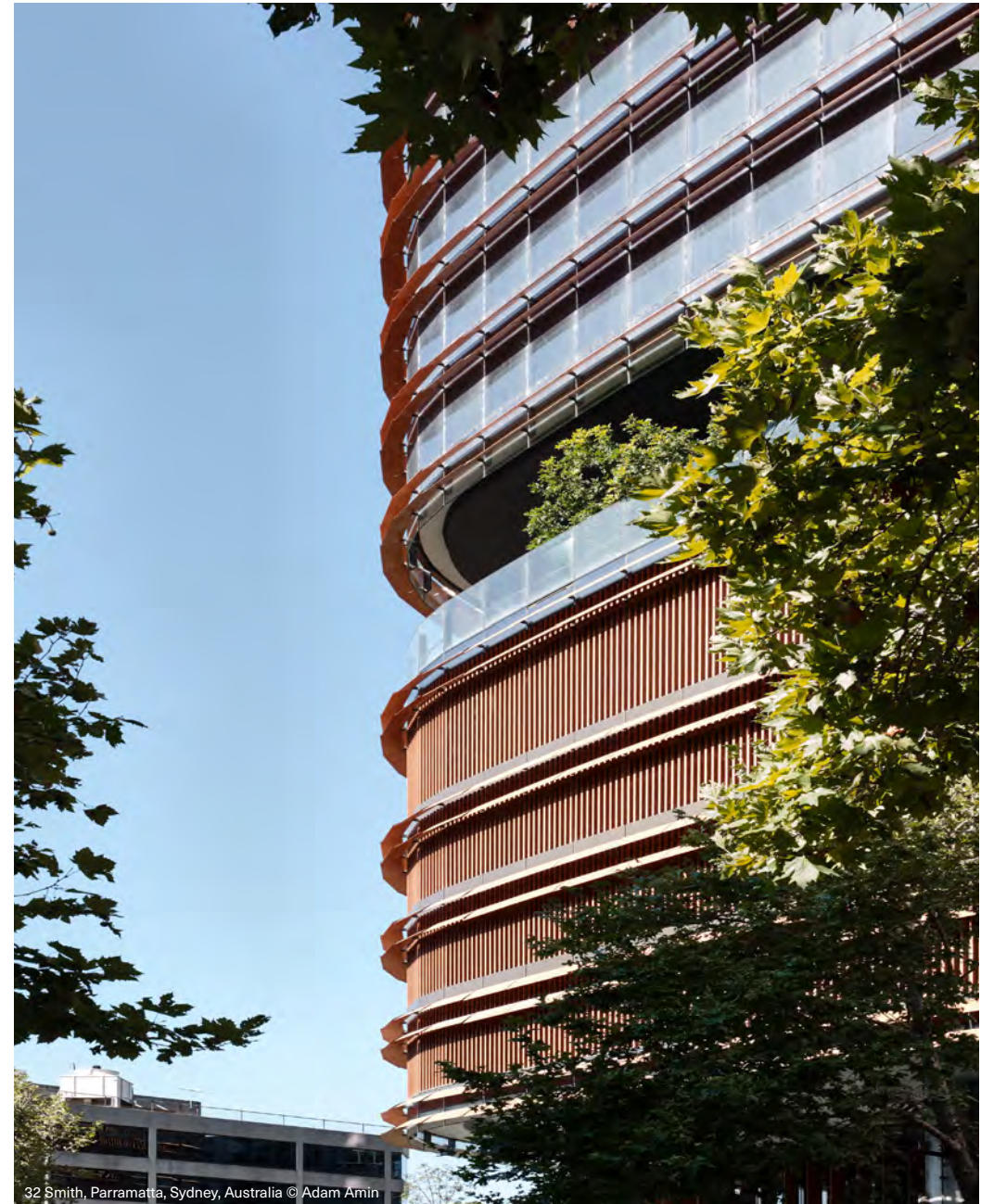
What does success look like?

Ultimately, success at achieving a net zero built environment will be the sum of everyone's choices – asset designers, developers, owners, operators and occupants too.

There needs to be a shift in thinking that asks, “do I need this?” whether “this” is a new building, or the choice to turn on air conditioning when it's not essential to have mechanical cooling operating and consuming energy.

Often people are more careful at home about consuming power, for example turning off lights in empty rooms or adapting themselves to ambient conditions. This same approach needs to be part of behaviour in workplaces or tenancies – understanding that while the energy bill is not going to land with the individual, the true cost of energy lands with all of us in the form of climate change and the costs of adaptation and mitigation.

Success looks like shared responsibility and everyone empowered and willing to take action within their sphere of influence.



32 Smith, Parramatta, Sydney, Australia © Adam Amin

“

It's about having a look at how end-of-life can be... a renewal of life rather than end-of-life. Start by changing your vocabulary. That's an easy one, right?"

—
Matea Čehovin

Success and
Scale Bring
Broad
Responsability

“

I think it's really heartening that you have that push from tenants in commercial and then us as retail owners encouraging and pushing and educating our retail tenants to come on the journey with us as well. So, it's a plus-plus, win-win for everyone."

—
Annie Scott

Technology client office, Barcelona, Spain, Europe © Perkins&Will

Acknowledgements

We would also like to thank all our clients for collaborating with us to improve the quality and sustainability of existing buildings. On the journey to net zero, together we can ensure no building is left behind.



Annie Scott, State Facilities Manager (Western Australia), Centuria Capital Ltd



Matea Čehovin, Sustainability Manager, Vicinity Centres



Gregory Kovacs, Design Director, Benoy

We would like to thank Annie Scott, Matea Čehovin, and Gregory Kovacs for sharing their expertise and experiences on retrofitting their assets. We are grateful for their openness in sharing the challenges and opportunities they have faced on the journey towards a net zero built environment.



UOW College Hong Kong, Hong Kong, China © ISG

References

- ⁱ WGIII Summary for Policymakers Headline Statements (ipcc.ch)
- ⁱⁱ AR6 Synthesis Report: Climate Change 2023 — IPCC
- ⁱⁱⁱ <https://www.nabers.gov.au/publications/energy-efficiency-commercial-buildings>
- ^{iv} <https://www.wri.org/insights/low-carbon-growth-26-trillion-opportunity-here-are-4-ways-seize-it>



CUNDALL

www.cundall.com

Asia Australia Europe MENA UK & Ireland

Designed and produced by Cundall graphics and marketing