
Beca
COP28 & beyond:
ASIA PACIFIC'S PATH TO PROGRESS
make
everyday
better.

Beca is one of Asia Pacific's largest independent advisory, design and engineering consultancies.

Our diverse and multidisciplinary teams are passionate about applying systems thinking and innovative approaches to the design and delivery of places and spaces where people live, work, learn and play.

Our Beca Group CEO **Amelia Linzey** and Industrial Group Director **Jimmy Walsh** attended the Conference of Parties (COP28) global climate summit in late 2023, as part of the New Zealand business delegation.

In this report, we present insights and perspectives from Amelia, Jimmy, and leaders across our business, and look ahead, to consider Asia Pacific's path to progress.

Our purpose, is to make everyday better.

> "Together with our clients, partners and communities, we are responding to climate change and working to shape a more sustainable, resilient and equitable future."

WITH CONTRIBUTIONS FROM:

Amelia Linzey, Beca Group CEO

Jimmy Walsh, Industrial Group Director

Tom Kelly, Business Director - Sustainability

Eleanor Grant, Principal – Industrial Sustainability

Cushla Loomb, Business Director - Climate Resilience

Sanchia Jacobs, Business Director - Local Government Advisory

Laura Robichaux, Senior Associate - Adaptation Planning

Tania Hyde, Technical Director & Circular Design Lead - Transport & Infrastructure

Scott Smith, Technical Director – Sustainable Buildings

Jo Healy, Associate – Social Outcomes

Jack Timings, Senior Process Engineer

John Duffy, Business Director for Energy Advisory

Adrian Dickison, Senior Technical Director – Chemical Engineering

Dan Jolly, Energy Efficiency Specialist B-Tune

Vincent Lobendahn, Fiji Country Manager

Mike Burrell, Executive Director at Sustainable Business Council, a special guest contributor

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We all have a role to play: COP28 & far beyond

INSIGHTS FROM AMELIA LINZEY, BECA GROUP CEO

COP28 was an important reminder that when you know better, you do better. And that's the insight – and the push – the conference gave me as CEO of a company that works alongside our clients and communities to respond to climate change, and to shape a just and equitable future for all.

I am honoured to have attended the climate summit in Dubai along with Jimmy Walsh, Group Director – Industrial, as part of the New Zealand business delegation. The conference provided a valuable insight into where governments are heading, and the conversations that are being had at a grassroots level to address the global climate crisis.

With a history spanning more than 100 years, we are proud at Beca of our relationships with clients and communities across New Zealand, Australia and the wider Asia Pacific, our heritage delivering creative and transformational solutions, and of the legacy we leave for current and future generations.

As a leader I am ambitious for how we can contribute to tackling the challenges of climate change. For this reason, I will continue to observe, to challenge – myself and others – to push for better outcomes and to design a future we can all be proud of.

Decarbonisation has been a strong focus for us and our clients, for a long time. Our work together continues as we help communities adapt and be resilient to climate change. We also actively look at ways we can be good and mindful kaitiaki or stewards of resources and the natural environment we all rely on to prosper.

WE HAVE THE TOOLS AND THE TECHNOLOGY

COP28 reaffirmed we have the right goals and priorities in place at Beca. It also identified the scale of risk whereby we need to stretch our minds regarding how change might look, along with the urgency that is required.

The Global Stocktake has demonstrated a well-versed challenge – we are not progressing fast enough to reduce carbon emissions to maintain global heating to 1.5°C.

As we better understand tipping points and the interrelationships of environmental and climatic processes, we are increasingly seeing a bigger magnitude of climate change than we initially anticipated.

We need to find a pragmatic balance of striving to implement the technology and science we have, in the work we do, to support a 1.5°C world. But at the same time, we need to look at how we adapt and can be resilient to a 2.4°C to 2.6°C (and more, based on our current global trajectory) warmer future.

During the next decade we must take rapid steps toward systems-based thinking, including the role of natural ecosystems, and be brave about the scale of change we need to respond to the impacts of an increasingly volatile climate on the physical, societal, and natural world. We have grown our awareness of risk and we must find ways to balance our appetite for risk with challenging new ways of thinking for future innovation. Our goal is to find a reasonable level of appetite – while maintaining positivity and realism – to enable the required innovations.

TIPS FOR BUSINESS

1. **Be prepared for conversations:**

As we look at solutions and mitigations for those at the forefront of climate change impact, we can likely expect a heightened focus on the Pacific, and a surge in conversations in Australia and New Zealand about our responsibilities towards displaced communities.

2. **Consider estimated migration:**

Climate migration will have big impacts for affected communities across the Asia Pacific, particularly those low-lying islands facing existential challenges due to sea level rise. Australia has announced its commitment to support the Tuvalu population, and New Zealand too will need to consider its role, in supporting the radical transformation facing some of our Pacific neighbours.

3. **Initiate lateral reductions:**

The commitment to reductions in methane, largely from asset management and clean up, will increase the global focus on methane. This is especially relevant for New Zealand, and while reductions in absolute terms is important, we may need to be lateral about where we achieve those reductions across all sectors.

WE ALL HAVE A ROLE TO PLAY – SUPPORTING SOCIAL AND NATURAL OUTCOMES

At Beca, we are committed to delivering practical solutions to real-world challenges. We are proud of our role as a delivery mechanism for the goals and policy set at a government level.

Our part in the puzzle is to draw on partnerships across our network and challenge ourselves and colleagues professionally, about how we are going to meet the set goals, aspirations and targets. This includes considering what modified designs and infrastructure will look like physically, especially relating to modelling scenarios and how these will be tested, and the skills needed to achieve optimal social and natural outcomes. It is also, importantly, about challenging some of our traditional risk appetite to be commensurate with the scale of change we need to see, to deliver transformation of our whole economy.

The way we design infrastructure projects has changed over the decades and this will continue to change when we look at the social and natural outcomes our communities want – and need – to achieve when it comes to climate change. Physically, we are considering the cultural, social and environmental dimensions when we are designing, to ensure the future is real and tangible.

What became evident at COP28 was the work we do across the Asia Pacific provides the opportunity for us to both apply a sub-regional lens, and to consider these experiences as a source of valuable learnings and stories we can share in other geographies. For example, the work we do alongside our international development clients to support communities in the Marshall Islands and Kiribati makes us think about what more we can do to enable sustainable outcomes while also driving and keeping sight of the need for equitable outcomes.

EVERYTHING, EVERYWHERE, ALL AT ONCE – COLLABORATION IS KEY

As we look towards the future, we must remember that the challenges we face are significant but are not insurmountable. We need to support each other to make progress.

It's my view that we must continue to work collaboratively, stand alongside each other and be realistically relentlessly positive.

Together we can land at a position where we ask ourselves, 'what can we do now, how can we keep pushing ourselves for more tomorrow?'

We know today's solution won't solve tomorrow's problem, and that for communities to adapt, a huge level of emotional resilience will be needed. It's about being totally realistic about the scale of the problem, the challenge ahead and rallying together so we can positively answer, 'what are we going to do about this?'

> "We are dedicated to playing our part in creating a sustainable, equitable, and resilient future for all. We know that the road ahead will not be easy, but we are driven by a sense of purpose and a desire to make a positive impact in the world. I'm a fierce believer in continuing to make a positive impact every day."
>
> **– Amelia Linzey, Beca Group CEO.**

The passion and excitement that our people and culture can bring to helping solve these very real and significant global issues is what really excites me. It's my privilege to have a role that motivates and taps into the team's ambition to drive this change but also to see the really amazing things that we are doing with our clients to solve some of these challenges across all our markets. Together, we will determine how far we can push the boundaries while keeping each other energised to innovate and seek continuous improvement.

COP28 serves as an important platform for acknowledging the intricacies and interdependencies of sustainability. It acknowledges the relationships between climate action, social equity, economic resilience, and global collaboration, and much more.

The following pages in this report explore the discussions from COP28 and provide valuable insights and perspectives from leaders across the business. I encourage you to read on, for more insights on how we are working with our clients and partners to respond to climate change and towards a more sustainable and resilient future for the Asia Pacific.

Lessons from COP28: Challenges, opportunities & a role for New Zealand

BY MIKE BURRELL, EXECUTIVE DIRECTOR AT SUSTAINABLE BUSINESS COUNCIL

I had the privilege of attending COP28 as part of the New Zealand business delegation, to represent the voice of New Zealand businesses, share our best practices and also our challenges, with the international community.

It was an eye-opening experience that gave me a lot of insights, ideas, motivation, and ambition for the future of Aotearoa and the world.

GLOBAL CHALLENGES NEED GLOBAL SOLUTIONS

When looking at COP28 there is a tendency for some commentators to focus on the easy critique, the narrative of flying all that way and burning up a whole lot of carbon to attend a "talking shop". But to me, what's the counterfactual?

> "If COP didn't exist, you'd have to invent it because this is well beyond the efforts of any single country, any single company, and any single technology. We need to collaborate, learn, influence, and inspire each other."

– Mike Burrell, Executive Director at Sustainable Business Council.

We need to work together across borders, sectors, and disciplines to find solutions that can scale up and make a difference. And COP is the place where this happens, where people come together to share, learn, negotiate, and commit to climate action.

PRIVATE SECTOR WITH PIVOTAL ROLE TO PLAY

One of the key insights that I gained was the scale of the transformation that is happening in the global economy, driven by the private sector. I saw a lot of evidence that businesses are seeing the opportunities and the value of shifting to a low-carbon and green economy, and that they are investing billions of dollars into this transition.

This was a relief, because it means that the change is inevitable and not reliant on regulators.

Businesses are responding to the market signals, the consumer demand, the innovation potential and the competitive advantage that come with being sustainable.

But there is a limit to what the private sector can do. We do need to work with nation states and contribute to multilateral discussion, as just as trade rules are essential to effective trade, climate rules need to work for industry.

THE NEED FOR BOLD ACTION AND NATURE-BASED SOLUTIONS

The sobering reality that I faced at COP28 was that we are still way off track to meet the 1.5°C target that the Paris Agreement set. The latest science from the International Meteorological Organisation shows that we are likely to overshoot this limit by 2030 and head towards a 2°C world. This will have devastating consequences for people and the planet.

What this means is we have to redouble our efforts to bend the curve of emissions down as fast as we can. We have to reduce, reduce, reduce emissions as much as possible. But we also have to 'bail the bath out' at the same time, to remove and absorb the excess emissions that are already in the atmosphere. We must do both things simultaneously and urgently.

This is where nature comes in. Nature is our ally and one of our key solutions to climate change. Nature can store and sequester carbon, regulate the climate, provide ecosystem benefits and enhance our well-being. But nature is also under threat from climate change and other human pressures. We have to restore and protect nature for its own sake and for ours.

WHAT NEW ZEALAND CAN DO AND LEARN

What can New Zealand do? We can innovate, keep being "doers", embrace our pragmatism, and continue to listen and contribute as we have on the world stage. We can continue to support trading partners China, Europe, Canada, and the US as they progress their own agendas – we can export our tech, innovation and thinking and benefit from free-flowing imports of the same.

I was impressed by the number of Kiwis involved in shaping the international rules and standards for climate action, such as carbon pricing, sustainability reporting and market mechanisms. This included Kay Harrison, New Zealand's Climate Ambassador, Sue Lloyd, who is the Vice Chair of the Sustainability Standards Board, and Wendy Miles, Co-Chair of the International Chamber of Commerce Working Group on Carbon Pricing. We have a reputation for being pragmatic, collaborative and compromising, which gives us access and influence in the multilateral arena. Hearing first-hand from these inspirational Kiwi leaders on a stage like COP was a reminder of how influential New Zealanders can be in the international arena.

Another of the examples of New Zealand's climate leadership is the Climate Leaders Coalition (CLC), which is a group of over 90 businesses that have committed to measuring and reducing their emissions, and to supporting the transition to a low-carbon economy. The CLC is unique in the world, and it is inspiring other countries, such as Canada, to follow our example.

THE ROLE OF PHILANTHROPY AND PARTNERSHIPS

The final insight that I gained at COP28 was the role of philanthropy and partnerships in accelerating climate action. I was impressed by the scale and the impact of the philanthropic sector, which runs into the billions of dollars. I was also inspired by the role of philanthropy in bridging the gap between the concept and the execution of climate solutions.

Philanthropy can provide the risk capital that is needed to test and scale up new ideas and technologies sometimes perceived as too risky for the private or public sector. Philanthropy can also catalyse and leverage the resources and the expertise of other actors and sectors, making it a climate action game-changer and a force multiplier.

> "This is why I think we need to embrace the four P's: public, private, philanthropic, partnerships. We need to work together across sectors and boundaries to achieve the common good."

– Mike Burrell, Executive Director at Sustainable Business Council.

We need to harness the strengths and the synergies of each partner. We need to be open and collaborative.

New Zealand makes a great testing ground and a showcase for this kind of approach. We are a small, contained and connected nation that can experiment and innovate at scale. We are also a trusted and respected nation that can attract and influence others. We have a lot to offer and a lot to gain.

CONCLUSION

COP28 was a challenging, inspiring, and motivating experience for me. It underlined for me the enormity of the problem, the urgency of the action, the scale of the transformation and the role New Zealand can play on the international stage. It also gave me a lot of hope and optimism that we can do this, that we have the solutions and the opportunities, and that we have the partners and the supporters. Together, we can make a difference.

EXPLAINER

The Global Stocktake

INSIGHTS FROM TOM KELLY, BUSINESS DIRECTOR – SUSTAINABILITY AND ELEANOR GRANT, PRINCIPAL – INDUSTRIAL SUSTAINABILITY.

Marking a significant moment in the history of COP conferences, COP28 saw the first ever Global Stocktake (GST) presentation.

WHAT IS THE GST?

The GST is a five-yearly means by which to 'take stock' of collective progress on implementing the 2015 Paris Agreement and its long-term goals, which include:

- cutting greenhouse gas emissions to limit global temperature rise to well below 2°C and ideally 1.5°C
- building resilience to climate impacts
- aligning financial support with the scale and scope needed to tackle the climate crisis.

It is intended as a mechanism for countries to course-correct and step-up the action needed to reduce the impacts of climate change.

For more, visit - UNFCC - Outcome of the First Global Stocktake

SO HOW ARE WE TRACKING?

Current climate actions are not nearly enough to keep global warming below 1.5°C and avoid the worst outcomes. We are at a critical moment.

Impacts of climate change continue to take a major toll on human lives and economies globally. The GST highlights this is particularly evident in vulnerable developing nations where there are limited resources available for protection.

The latest Intergovernmental Panel on Climate Change (IPCC) report highlights that actions taken this decade will have impacts "for thousands of years." Together we must step up our efforts locally and globally to get on track.

MITIGATION, ADAPTATION AND IMPLEMENTATION

In assessing global progress across the scope of climate issues to date, the Stocktake provided further direction for countries' next round of Nationally Determined Contributions (NDCs) and official commentary on progress against three key areas critical in the ramp up of climate action: mitigation, adaptation and implementation.

1. Mitigation and the harmful effects of climate change

Global emissions need to peak rapidly and be followed by a sustained rate of reduction if we are to achieve a net-zero world by 2050. State actors and hard-to-abate sectors including many entities throughout the Asia Pacific region and beyond, have both the responsibility and in many cases the commercial drivers to deliver these reductions.

In our work with clients across the Asia Pacific we are starting to see the benefits of a more legislated environment, and examples of how such emissions reductions can be delivered independent of geography, sector, technological maturity or political will. This is encouraging.

In Australia, we are actively involved in delivering transmissions projects to enable energy transition, and we are seeing considerable focus and investment in both transition, and efforts to reduce emissions across sectors. Take for example the investment in Renewable Energy Zones (REZ) such as Central-West Orana, which is predicted to unlock upwards of 4.5 gigawatts of new network capacity by the mid-2020s, and bring up to AU$10 billion in private investment to the region by 2030.

Further examples of progress in Australia can be seen in the NSW Sustainability Standards for non-residential developments, and with the national Safeguard Mechanism, which is targeted at facilities across the mining, manufacturing, transport, oil, gas and waste sectors – including a number of our clients. In New Zealand, the Carbon Neutral Government Programme is another example where we see policy drivers that are directing investment and strategic decision making.

We know deep emissions cuts can be made with existing technology and foresee deeper and more rapid mitigation outcomes as solutions integrating nature-based thinking, renewable energy generation, distribution and storage both scale-up and become better understood as levers to pull.

NDCs are central to the Paris Agreement and the achievement of its long-term goals. As we consider the next COP we should expect to see the second round of NDCs be more ambitious – covering all Greenhouse Gases (GHGs), sectors and economies, whilst reflecting national circumstances, funding support and in the context of a just and orderly transition. The GST recognises the importance of a variety of approaches and pathways to contribute to the reductions required to achieve these NDCs including:

- tripling of renewable energy generation
- doubling of energy efficiency improvements
- accelerating zero and low emissions technologies, and
- reduction of those non-CO_2 emissions sources including methane.

2. Resilience and adaptation

Efforts to deliver resilient and adaptive environments globally are currently uneven and inequitably funded. The GST highlights that for ongoing resilience and adaptation efforts to become 'transformational' they must also recognise the efforts of developing countries – many within the Pacific region – and the more severe and time critical challenges they face.

During the next decade we must see rapid steps toward the inclusion of systems-based thinking, including the role natural ecosystems will play as expediters in the way we respond to the impacts of an increasingly volatile climate on the physical, societal, and natural environments we rely on.

One of the ways we should expect to globally respond is through the adoption of the Global Goal on Adaptation; we see responses to this framework in each of Beca's main APAC regions with a particular focus on the Pacific region. Key to the implementation of any meaningful adaptation response must be access to funding via responsible operationalisation of the 'Loss and Damage Fund'.

While pledges to date are commendable, they alone will not deliver the implementation activity that is so needed.

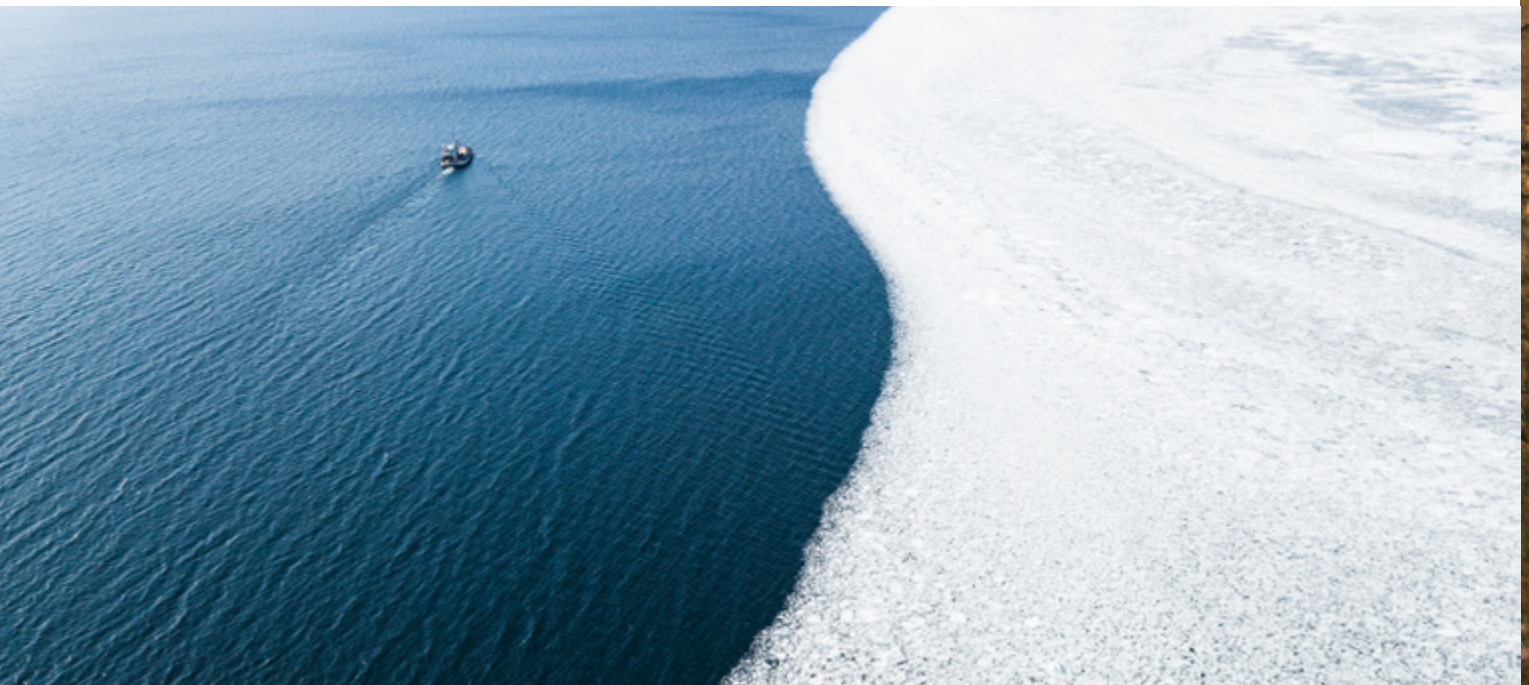
We must address questions of how climate migration challenges can be responded to in fair and equitable ways, both in terms of financial support and wider cultural change. We need to bridge the gap between concepts and discussion, to on-the-ground meaningful and momentum-growing action across the many climate action fronts we find ourselves having to react to.

3. Means of implementation

Robust implementation is essential for an equitable and orderly response to the impacts of climate change. This includes access to funding with minimal friction and concessions, it also means the provision of appropriate support around technology-transfer and capacity building within developing countries.

The GST also highlights the importance of avoiding 'unilateral measures that impact the national efforts to achieve sustainable development'.

This underscores the importance of a multi-lateral response to implementation, where nations, sectors and businesses cooperate to empower/enable nation specific responses. We see this in practice currently with the focus that we and others, are placing on the Pacific region.



Our focus themes for impact

AT BECA, WE'RE COMMITTED TO MAKING EVERYDAY BETTER.

Recognising our world's pace and scale of change – from climate, migration and demographic changes, technology and more – we engaged with our people and clients to ensure our services reflect what they value and expect from Beca, and deliver greatest and most sustainable impact.

Three guiding themes were identified, which will help shape our strategy and delivery for the next 3-5 years: Decarbonisation, Climate Adaptation & Resilience, and Resource Stewardship.

IN FOCUS

Decarbonisation

INSIGHTS FROM ELEANOR GRANT, PRINCIPAL – INDUSTRIAL SUSTAINABILITY AND JACK TIMINGS, SENIOR PROCESS ENGINEER

Decarbonisation has been one of the priority areas of COP since its inception. The signing of the Paris Agreement in 2015 has helped to drive near universal action on climate by setting goals and sending signals to the world that urgent action is needed.

AT A GLANCE

- Decarbonisation has been a priority for COP since its inception, but as of COP28, progress remains slow and stronger actions are needed to meet the global emission reduction goals set by the Paris Agreement.
- New commitments mean our industrial and buildings sectors will need to decarbonise faster than planned, and sectors like transport and agriculture will need to start their emissions reduction journeys earlier than anticipated.
- Read on for more on what three companies are each doing differently, to cut carbon emissions, develop a detailed roadmap towards net zero, or lower the carbon intensity of fertiliser.

The Paris Agreement set the global emissions target for a 43% reduction of global GHG emissions by 2030 and net zero by 2050. However as of COP28 its evident we're falling behind.

The United Nations' 2023 NDC Synthesis Report identified current progress remains too slow, and highlighted the urgency for nations, governments, business, and industry to take stronger actions to bend the global emissions trajectory curve.

We need sector-specific investment in the just energy transition, and of particular importance to us and our clients, we need system-wide change across industrial, transport and buildings sectors, to reduce process and energy emissions.

Done well, decarbonisation can support not only a reduction in GHG emissions but also a just and equitable transition, by building new economies reliant on nature-based solutions with circular pathways for materials.

WHAT DID THE GLOBAL STOCKTAKE SAY?

The global stocktake is clear we have made significant progress, but we are not on track for a 1.5°C world. Based on current planned reductions by member countries there is still estimated to be an additional 20.3-23.9 Gt CO2eq of emissions (yes, that's in gigatonnes, or 1,000 million tonnes) that will need to be mitigated to stay within 1.5°C.

To put that number in context, it is over 300 times New Zealand's 2021 gross emissions. It is clear we need more ambitious targets implemented and need to do so at pace!

WHAT DID NEW ZEALAND AND AUSTRALIA COMMIT TO, OR SUPPORT?

In response to the need to accelerate decarbonisation, a number of new declarations and pledges were introduced. New Zealand and Australia committed to the following new initiatives among others at COP which build on our Emissions Reduction Plan and other national decarbonisation policies:

- **The Global Renewables and Energy Efficiency Targets Pledge**

New Zealand and Australia are supporting the international goal to triple renewable energy capacity by 2030, and improve energy efficiency by 4% year-on-year. In New Zealand, while the electricity grid is about 85% renewable, when we consider energy for transport, heating and industry only 30% of the energy used is from renewable sources, with the other 70% provided by fossil energy. As we transition those to renewable energy – this will require a massive increase in generation. New Zealand has an existing target to double its own capacity by 2050, so this represents a large increase in ambition and we can expect the nation to play a larger role in supporting renewable energy development both domestically and across the Pacific to meet this new pledge.

- **The Emirates Declaration on Sustainable Agriculture**

New Zealand and Australia support the inclusion of food and food system emissions in setting targets for NDCs. New Zealand's commitment to this declaration is a commitment to improving resilience of our local and domestic food systems as well as implementing pathways to low-emissions agricultural systems. Carbon emissions from the agricultural sector make up almost half of New Zealand's gross emissions, and our primary industries are some of the most at-risk when considering the impacts of climate change. Just under 20% of Australia's emission come from agriculture and are therefore also a significant contributor making it an important focus area for the country.

- **Certification Schemes for Renewable and Low-Carbon Hydrogen and Derivatives Pledge**

Green hydrogen will an important tool in the decarbonisation of hard to abate sectors, and international partnerships will be key in delivering the technologies to enable hydrogen to play its role in global decarbonisation. The mutual recognition of Certification Schemes for Renewable and Low-Carbon Hydrogen and Derivatives Pledge. The intention here is to develop internationally-recognised certification system for H2 and H2-derived products, making it easier to track and monitor emissions from hydrogen manufacture internationally.

WHAT DOES THAT MEAN FOR OUR SECTORS?

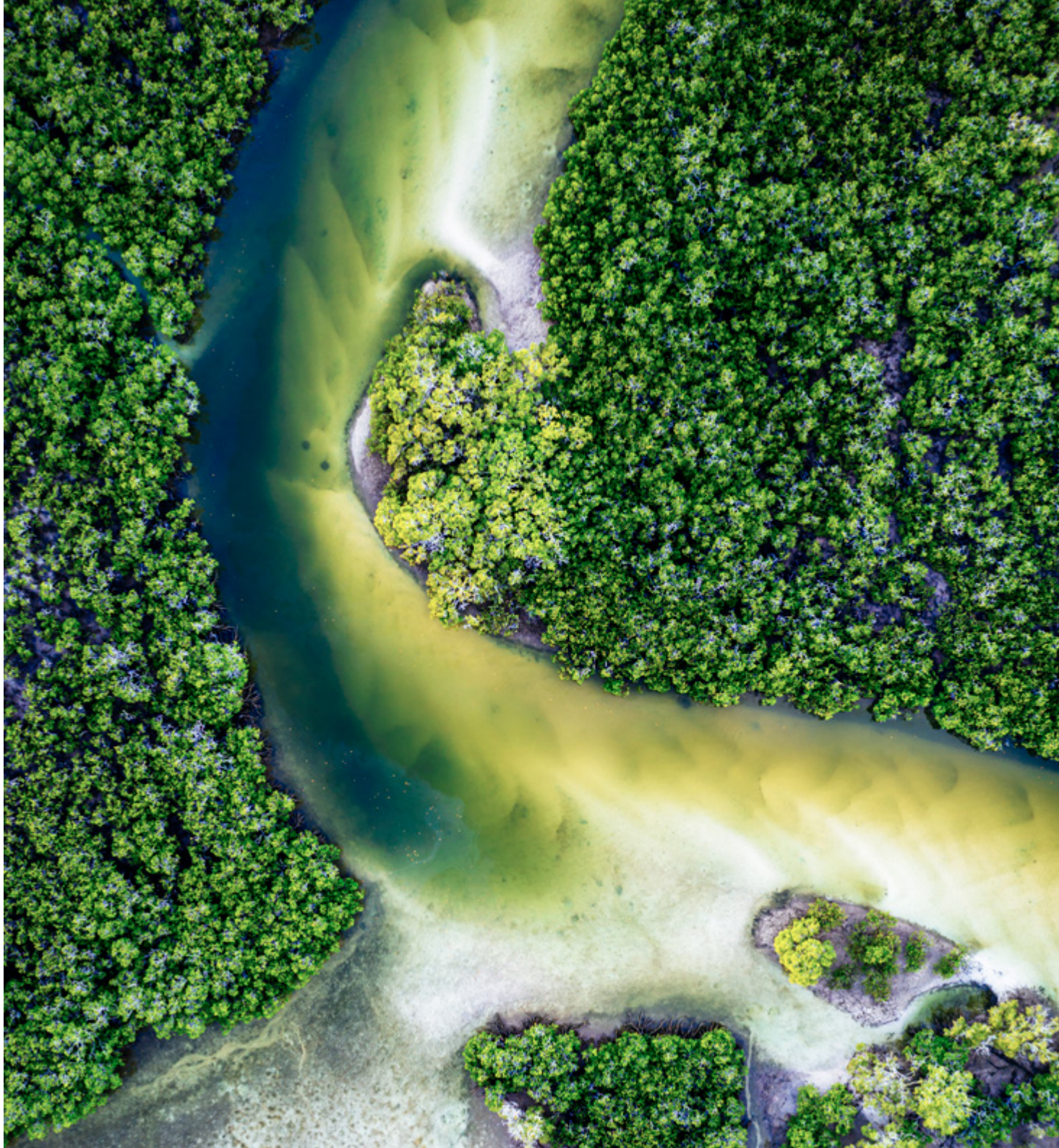
These new commitments, and the need to address the shortfall in emissions reduction progress, mean that our industrial and buildings sectors (the two sectors planned to achieve the majority of emissions reductions in the first three emissions budgets set by New Zealand) will need to decarbonise even faster than planned, and sectors like transport and agriculture will need to start their substantive emissions reduction journeys earlier than anticipated.

It is encouraging to see such investments as the Australian Government partnership with the International Union for the Conservation of Nature (IUCN) and investment in restoring and protecting global blue carbon ecosystems including mangroves, seagrasses and tidal marshes through the Blue Carbon Accelerator Fund.

Future energy systems will continue to evolve from what we know and use today. With the rise of renewables, conversion and storage technologies, the energy landscape has changed. We can no longer use fossil fuels for low-cost energy solutions.

New Zealand and Australia's commitment to partner internationally to triple global renewable energy production will mean the continuation of domestic development but more significantly will be the support the nations will need to provide to their Pacific neighbours.

Energy efficiency will also need more focus in government transformation plans across both industry and the building sectors in light of 4% year-on-year targets, so these can turn from pledge to reality.



CASE STUDY

PROJECT ELECTRON - PARTNERING WITH NEW ZEALAND STEEL

NZ Steel is on its way to cutting carbon emissions by over 45%, through the introduction of an Electric Arc Furnace (EAF).

Beca is supporting NZ Steel to deliver this industry wide change that was unlocked through a collaboration between NZ Steel, the New Zealand Government, and electricity supply partners Contact Energy.

The project not only reduces New Zealand's carbon emissions but provides a circular economy solution for the production of steel, a core building block of our Green economy.

At Glenbrook, the project is expected to be completed by 2027 and will reduce the plant's carbon emissions by at least 800,000 tonnes per annum. This is equivalent to removing 300,000 vehicles from the road.

CASE STUDY

ST BARBARA DECARBONISATION ROADMAP

Mining facilities are complicated beasts that require intricate energy solutions; much more than a simple switch to renewable energy, as would be the case in some other industries.

Working with St Barbara, a gold mining company, it was clear there was no "one size fits all approach" for their global operations, given the differences between them. St Barbara was keen to explore more than just an energy transition in their plan.

Our team led a study of the client's global business operations, to advise on what needed to change and when to achieve their aspirational sustainability goals.

The outcome was a detailed roadmap with more than 15 actionable insights and a roadmap towards net-zero by 2050. Our team provided a big picture solution promising future resilience, with consideration of the financial and community impacts.

These included:

- switching to low emissions vehicles, including electric haul trucks and light vehicles
- where possible, connecting to the grid for access to renewable electricity
- hybrid renewable installations (including wind, solar and batteries)
- implementing an alternative cooling strategy
- innovative energy storage for periods of reduced renewables and excess renewable generation.

Existing cleaner technologies need to be more rapidly deployed and then transferred to developing countries to support their transition.

There are many low-emissions technologies like efficient motors, heat pumps, EVs, battery systems and efficient ventilation/lighting systems that can make an impact almost immediately. Some sectors will need to wait for innovation to provide the pathways for large-scale decarbonisation, especially agriculture, but setting appropriate strategies and pathways for these hard-to-abate sectors needs to be done in tandem with deployment of readily-available technology.

Overall governments will need to balance the stick and the carrot as they assess how they can drive commercial and industrial sectors to accelerate progress.

CASE STUDY

LOWERING THE CARBON INTENSITY OF FERTILISER

Global food supply is reliant on fertiliser, and more than half of the global fertiliser is nitrogen-based, including urea. Ammonia is the building block for all manufactured nitrogen fertilisers and its manufacture is energy intensive. Almost all manufactured ammonia production uses fossil fuels as its energy source, which in turn results in significant CO2e emissions.

Ballance Agri-Nutrients Ltd is working towards a solution to lower the manufacturing emissions of its domestically produced urea. Domestic production of urea reduces reliance on offshore producers and improves New Zealand's ability to produce affordable, low carbon food while supporting the local community both directly and through employment opportunities in a rural location.

We've been on the journey from the start, providing a range of services to frame the opportunity and help develop a solution reliant on mature, proven technology that integrates well with the existing asset.

IGNITE YOUR THINKING

The courage to collaborate – making energy transition a reality

BY JOHN DUFFY, BUSINESS DIRECTOR FOR ENERGY ADVISORY

Energy transitions are at the forefront of global discussions, reshaping our future.

The COP28 Global Renewables and Energy Efficiency Pledge recognised the need for a significant increase in the deployment of renewables and energy efficiency improvements on a global scale by 2030. This is necessary to maintain warming well below 2°C and limit warming to 1.5°C, in line with the Paris Agreement.

This pledge also saw the commitment of signatories (including Australian, New Zealand and Singapore Governments) to 'work together to triple the world's installed renewable energy generation capacity to at least 11,000 GW by 2030, taking into consideration different starting points and national circumstances.'

At Beca, we're not just participants in this change; we're actively working with our clients to connect possibility with reality in the future energy landscape.

The energy sector is a behemoth of change, shaped by the intricate interplay of geopolitical, trading, and resource dynamics. We are finding ourselves at the epicentre of transformation. Urgency within the sector grows with each challenge: the demands of stakeholder engagement, environmental rigours, and the escalating needs to rapidly deliver key infrastructure.

Our global imperative to address climate change demands a unified front, and collective innovation. We need to leverage multi-agency collaboration, especially in planning, developing, and delivering the crucial electricity transmission networks underpinning our decarbonisation goals.

Yet, we find ourselves at a crossroads. Acceptance of the urgent need for change is widespread, but the sector's response often lacks the necessary coordination and collaboration. Diverse regulations, drawn-out procurement processes, and disparate risk transfer approaches impede our collective response's pace and efficacy.

WITHIN CHALLENGE LIES GREAT OPPORTUNITY

The challenges we face as a sector are as complex as they are pressing; communities calling for transparency, navigation of complex regulatory environments, supply chains stretched thin by the sector's growth, and costs climbing skyward.

Yet within these challenges lie opportunities for evolution to transform the traditional approaches to procurement to accelerate infrastructure programme and project delivery, supply chain growth, and build economies of scale. Embracing this momentum, we can look for insights from successful models of collaboration that have already paved the way in other areas to achieve similar outcomes.

Notably, the Te Tupu Ngātahi Supporting Growth Alliance programme in Auckland demonstrates how unity in purpose and action leads to transformational achievements – delivering a comprehensive transport infrastructure corridor network to support Auckland's burgeoning growth over the next three decades.

Beyond planning, the programme has cultivated a dedicated team focused on complex issues, drawing from a pool of owner participants, consultants, and legal advisors. This collaborative ecosystem has achieved far more than any participant could have achieved alone — a synergy fostering continuous innovation, community involvement, and lasting legacies.

COLLABORATION'S ROLE IN A CRISIS

As we face the climate emergency, the parallels between post-disaster infrastructure responses, such as to floods and earthquakes, and our energy transition challenges are also striking. There is a clear and consistent need for cohesive action and heightened collaboration— uniting governments, infrastructure agencies, and supply chains to restore and enhance our infrastructure planning and delivery now and into the future.

New Zealand's alliance contracts in the aftermath of the Christchurch and Kaikoura earthquakes provide such a blueprint for success (see, for example, this Infrastructure New Zealand case study on the SH25A Taparahi Bridge). These contracts forged organisations with common goals, inclusive governance, and a shared commitment to providing the necessary resources. With integrated teams and a shared risk-reward framework, decisions were made swiftly, often with limited information, yet resulted in enhanced efficiency, innovation, and re-connected communities.

PARTNERING FOR SUCCESS IN WATER, WASTE AND ENERGY

In Australia, our collaboration with Yarra Valley Water's groundbreaking ReWaste facility exemplifies innovation in sustainability and community partnership. Beca brought to the table our technical expertise, and together with Yarra Valley Water and over 20 businesses providing organic waste materials, we have successfully transformed significant amounts of food waste into clean energy. This joint effort is powering thousands of homes and contributing to Yarra Valley's ambition to produce 100% renewable energy by 2025.

Our dynamic seven-year partnership with Greater Western Water, operated as the CH2M Beca Joint Venture, exemplifies the transformative power of strategic alliances in the utility sector. Through our combined efforts in planning, design, and delivery, we've not only brought the Advanced Waste Treatment Plant at Melton to fruition but also fostered a culture of innovation and long-term investment in sustainable practices.

This collaboration has been crucial in realising outcomes that would not have been possible individually, such as the facility's processing of 13 million litres of sewage each day with an innovative nutrient recovery process. This process effectively captures and repurposes phosphorus and nitrogen, thereby significantly mitigating environmental pollution. This collaboration between CH2M, Beca, and Greater Western Water encourages investment in state-of-the-art technologies and a shared risk management approach, ensuring resilience and adaptability. This joint initiative underscores our commitment to environmental stewardship and propels us toward the principles of a circular economy. The plant's contributions are significant, cutting greenhouse gas emissions by over 3,000 tonnes of CO2 equivalent annually, which supports the state's drive for sustainability and carbon neutrality.

The joint effort stands as a thriving model of how we can turn waste management into an energy solution, reflecting our shared commitment to progress, sustainability, and adaptive strategies in the face of growth and environmental challenges.

INTO OUR ENERGY FUTURE

Collaboration is about bring together diverse expertise to foster economic and environmental progress. It's about a shared vision, clear roles, managed risks, transparent decision-making, and the certainty of investment that adapts with each new learning – underpinned by a willingness to embrace new methods and frameworks.

As we look ahead, the potential of utilising collaboration frameworks as an approach to accelerate transmission network development becomes clear. These types of innovative, united efforts are key to developing robust supply chains, overcoming industry challenges and enabling the acceleration of energy transition.

Together, we must invest in partnerships with defined outcomes in mind — outcomes that transcend traditional project deliverables and pave the way for knowledge sharing and sector-wide innovation.

In Australia and New Zealand, such cooperative endeavours are already starting to enhance the energy sector landscape, marking a collective path toward a sustainable future and setting foundations for industry-wide transformation.

IN FOCUS

Climate adaptation and resilience

INSIGHTS FROM CUSHLA LOOMB, BUSINESS DIRECTOR - CLIMATE RESILIENCE; SANCHIA JACOBS, BUSINESS DIRECTOR - LOCAL GOVERNMENT ADVISORY; AND LAURA ROBICHAUX, SENIOR ASSOCIATE - ADAPTATION PLANNING

At COP28, there was a clear recognition that countries are making progress in their efforts to develop and implement national adaptation plans.

AT A GLANCE

- COP28 highlighted the power of collaboration and the importance of utilising nature-based solutions to tackle both the climate and biodiversity crises.
- The State of the Climate report presented at COP confirmed that 2023 was the warmest year on record, and mitigation alone will not be sufficient to manage impacts, therefore adaptation is required.
- Read more about two case studies: one focused on developing nature-based adaptation pathways in the Republic of the Marshall Islands, and another centred around collaborative efforts to develop an adaptation plan for South Dunedin, New Zealand, that considers social cohesion and indigenous knowledge.

The COP28 final outcome includes a call for all countries to have their adaptation plans in place by 2030. Experts say these ambitious targets will help direct support and finance to where it is most needed, accelerating action.

The State of the Climate report presented at COP confirmed that 2023 was the warmest year on record. The data informing this assessment, as well as extreme weather events experienced throughout the Asia-Pacific region have made it clear that our climate is changing. Mitigation or decarbonisation alone will not be sufficient to manage impacts, and therefore adaptation is required.

COP has further highlighted that no single discipline, organisation, region or group will have all the answers when it comes to adapting to the impacts of climate change. What it has demonstrated is that there is power in collaboration – not just working together, but in learning from those experiencing the impacts first-hand.

COP has also highlighted the importance of utilising nature-based solutions as a way of tackling both the climate and biodiversity crises. Two of our recent adaptation planning projects have shown the immense value of collaboration and placing the environments and collaboration with communities at the heart of adaptation responses of adaptation responses – a Vulnerability Assessment and Adaptation Plan for the Republic of the Marshall Islands and the South Dunedin Future programme.

Leading up to COP28, we were anticipating the outcome of the Global Stocktake on Adaptation. While the stocktake was not overly prescriptive on adaptation planning, financing, reporting or target setting, there were a number of key values and principles recommended – including a focus on collaboration and nature-based solutions.

The other values highlighted include recognising the leadership of indigenous peoples, the need for capacity building, and aspirations to monitor and evaluate adaptation progress. These values are shared by our multi-disciplinary adaptation and resilience teams throughout the Asia Pacific Region. We welcome opportunities to collaborate with communities, governments, researchers, consultancies and others to deliver transformative, nature positive adaptation plans that improve resilience.

CASE STUDY

BUILDING RESILIENCE IN THE REPUBLIC OF THE MARSHALL ISLANDS

The communities of the low-lying atoll country of the Republic of the Marshall Islands have been adapting to not only climate change, but a history of nuclear testing, for generations.

Our work undertaking a vulnerability assessment and the development of long-term adaptation pathways to inform the National Adaptation Plan seeks to utilise grass-roots options, such as nature-based solutions, for short- and medium-term adaptation that will empower even greater resilience in the communities and allow them to stay connected with their land as long as possible. For example, recently published climate science suggests that as sea levels rise, over the longer-term Pacific atolls may become smaller and higher, gradually building up in response to sea level rise (Masselink, et al., 2020).

Our team developed adaptation pathways including provisions for raising traditional housing (including through post-disaster rebuilding) to allow this build up to naturally occur. At some point though, sea levels are likely to rise faster than the islands can naturally build themselves up. For this reason, a number of adaptation measures were suggested to be implemented now to facilitate longer term measures with long lead-in times, such as relocation. This will minimise the social and cultural impacts of implementing these options over time. The work was supported by on-island partners who were able to facilitate targeted discussions with sector leads and community advocates to inform grounded, practical evaluation of adaptation options.

CASE STUDY

COLLABORATION, ADAPTATION, AND THE SOUTH DUNEDIN FUTURE PROGRAMME

In New Zealand local authorities are facing significant fiscal and capacity challenges, compounded by an increasing need to respond to climate-related weather events that stretch resources to their limit. Many councils do not have the capacity to proactively look to the future and deal with the size of the resilience challenge that lies ahead. But there are examples of councils that are investing deeply to ensure the communities they serve are adapting – Dunedin is one of them.

South Dunedin communities face one of the highest flood risks in New Zealand with the highest risk of flooding. A large portion of the buildings are already within 50cm of present-day sea level. The communities that live in South Dunedin are generally more ethnically diverse, older, and have a higher proportion of people with mobility challenges as well as being a lower socio-economic population than the wider Dunedin area. Like in the Marshall Islands, South Dunedin requires practical, actionable pathways for adaptation. Beyond only considering adaptation, Dunedin has ambitious emissions reductions goals as well as aspirations to reduce the city's resource consumption to a sustainable level.

To reduce flood risk while also meeting emissions and environmental goals, nature-based solutions will likely be required. This requires thoughtful, community-centric adaptation combined with the ancestral knowledge held by mana whenua (indigenous peoples with ties to the land and waters) to consider social cohesion, wellbeing, and place attachment alongside physical measures to reduce risk.

To develop this plan, a collaboration of the local and regional councils, a consultant team (including Beca, WSP and Tonkin + Taylor) and mana whenua are working closely with the community over the next three years to develop an adaptation plan. There are significant challenges ahead, as well as difficult conversations with communities because the one thing that is certain is that South Dunedin will change over the next 100 years. By working collaboratively and actively sharing knowledge and lessons learned, we have the opportunity to help guide that change and work towards a vibrant, safe, sustainable future finding a balance between people, water and space.

EXPLAINER

The Loss and Damage Fund

INSIGHTS FROM CUSHLA LOOMB, BUSINESS DIRECTOR – CLIMATE RESILIENCE AND TOM KELLY, BUSINESS DIRECTOR – SUSTAINABILITY

At COP28, a landmark decision was made recognising the disproportionate impact of climate change on vulnerable nations.

WHAT IS THE LOSS AND DAMAGE FUND?

Loss and Damage refers to the impacts caused by the physical effects of climate change, including floods, drought, extreme heat and sea level rise. At COP28, it was specifically applied to vulnerable communities, which urgently need financial support to recover from trauma and the loss of homes, lives and livelihoods. After years of negotiations, at COP28 the Loss and Damage Fund was operationalised. Parties reached the historic agreement on the first day of the conference in 2023 and the Fund raised more than US$700 Million as at 13 December, 2023.

While the operationalisation of the Fund is a significant step forward, experts suggest more is needed to address how the fund can best address local needs and contributions to the fund have a long way to go to address rising challenges.

Sources: unfccc.int/news/cop28-agreement-signals-beginning-of-the-end-of-the-fossil-fuel-era

The establishment of the Loss and Damage Fund is a major step forward in compensating developing countries, which bear the brunt of climate change, despite being the lowest contributors.

While Beca is optimistic about the Fund's potential to have a positive impact, we note the importance of establishing a transparent framework to ensure the funds are accessible and equally distributed to those who need it most.

ESTABLISHING THE LOSS AND DAMAGE FUND

After years of negotiations, major countries have pledged money to the Loss and Damage Fund, which will go directly to vulnerable communities in developing countries.

It is a climate change milestone, as the global community acknowledges some countries are disproportionately affected by climate change.

> "While this is a step in the right direction, there is a long way to go to see a real difference on the ground, to meet the objective of the Fund and actually help these countries which are bearing the brunt. The ongoing challenge is to ensure the funds are adequate, accessible and distributed equitably."

– Cushla Loomb, Business Director - Climate Resilience.

Funding to date has been far lower than what is needed. Estimates suggest roughly US$100 billion per year needs to be committed for the next five years and that this funding must come from developed countries and organisations in a fit-for-purpose way. The distribution and mechanisms by which funding is administered all must be carefully considered. The World Bank is suggested as the interim trustee and host of the Fund for a period of four years, whilst agreements are reached for a more permanent and ongoing arrangement.

IMPLICATIONS FOR ASIA-PACIFIC

Through Beca's experience working with Pacific Island governments and communities we have seen first-hand the impact of climate change on small nations, and the assistance they will need to benefit from the Loss and Damage Fund.

> "Coming from the small, remote Pacific Island of Rotuma in Fiji and growing up in the Pacific, I have experienced first-hand the impacts of climate change. One thing is clear, the impacts of climate change being experienced today are much more significant than ever before – higher temperatures; shifting rainfall patterns; rising sea levels and changes in frequency and intensity of extreme climate events. With our families at the front line and being the most vulnerable there is a shared responsibility by the global community to assist our Pacific neighbours. The COP28 Loss and Damage Fund will go a long way in helping vulnerable Pacific communities like my own, deal with the impacts of climate change."

– Vincent Lobendahn, Fiji Country Manager.

Encouraging signs include the Australian Government's commitment to contribute AU$100 million to the Pacific Resilience Facility (PRF), and their rejoining and contribution of AU$50 million to the Green Climate Fund. The PRF is a climate resilience financing facility which will administer the funding programmes for climate adaptation and disaster preparedness, and respond to loss and damage across the Pacific Region.

As it is, we are already helping our clients frame what climate loss and damage will mean to them. This is complex as many of the impacts are difficult to quantify in terms of scale of loss and damage, for example social impacts.

These complex perspectives felt across the world represent a major challenge for small nations, who typically don't have the capability or capacity that may be needed to appropriately access the Loss and Damage Fund.

INSIGHTS AND OBJECTIVES

We acknowledge that there are significant challenges ahead to meet the objectives of the Fund, including:

1) Process development and implementation

Creating a clear and transparent process to ensure affected countries have the capability and capacity to manage these funds.

2) Loss and Damaging positioning

Framing what Loss and Damage is, both the economic and non-economic impacts is challenging as many impacts, such as social impacts, cannot be easily quantified. This is made more difficult by the lack of necessary information available in developing countries and the fact that many impacts are a complex 'cascade' (i.e. one impact, leads to another and another).

3) Identifying climate change impacts

It is inherently difficult to attribute what impacts are caused by climate change (i.e. from anthropogenic causes) as opposed to what are natural hazard events.

4) Effective allocation

Identifying what projects to best use funds for is critical, to ensure the Fund is being used by countries for beneficial gain relating to resilience and climate change impacts. This includes a need to understand what is actually practicable on the ground in these remote and developing countries that are often resource constrained.

5) Equitable fund distribution

There is already contention around the scale of each country's loss and damage due to climate change. There will be a need to make sure that countries that may not be as well-resourced and able to put forward requests to access the funds, compared to other developing countries, are not disadvantaged. There will also be a need to establish an assessment methodology that means countries access the funds based on need.

This would best be considered at a country level, otherwise developing countries may feel 'pitted' against each other.

6) Establishing institutional arrangements to deliver projects

Accessing the fund is one thing, but as we have seen, often there is a lack of capacity or resource to actually implement the projects on the ground. This includes ongoing monitoring for the effectiveness of the projects implemented using the funds.

POTENTIAL FOR A POSITIVE IMPACT

As it stands, it is still unclear how the Loss and Damage Fund can benefit the communities most affected by the impacts of climate change, however it is a step in the right direction. We look forward to seeing the progress on developing the frameworks that will support the Fund.

> "We commend the establishment and operationalisation of the Loss and Damage Fund, but we need to ensure the funding is directed and managed in a way that it can establish resilience in communities which have experienced the devastating effects of climate change."
>
> **– Tom Kelly, Business Director – Sustainability.**

The solidification of this agreement is a significant milestone and an exciting opportunity for our Asia-Pacific region. It signals an acknowledgement by the international community that there are communities that have suffered the effects of climate change, despite being the lowest contributors to the problem.

However, the ultimate goal of the Loss and Damage Fund cannot be achieved unless key measures are established to make the funds accessible and equally distributed for the developing countries it seeks to benefit, and there is a far greater monetary contribution by developed countries and large organisations to the Fund.

IGNITE YOUR THINKING

Prioritising social cohesion for resilient communities

BY JO HEALY, ASSOCIATE – SOCIAL OUTCOMES

Climate change is transforming not only our environment but is also a fundamental aspect of how our societies function – including social cohesion. Vulnerable countries and communities alike find themselves needing to adapt, a process often tied to the sense of connection within a community and belonging to a particular place.

As we know from our work with communities across the Asia Pacific, and heard as a rallying cry at COP28, those most at risk from climate change all too often lack the resources needed to adapt and change. Social cohesion – how communities come together, work towards common goals, create social capital and manage existing inequalities – is critical to the implementation of effective climate adaptation strategies, and the management of potential impacts.

The 'COP28 declaration on climate, relief, recovery and peace', supported by governments, private companies, and public and philanthropic organisations around the globe, was a call for collective action to support climate resilience for our most vulnerable communities.

The declaration highlighted the effects of fragility and conflict on people's exposure to climate hazards, and the simultaneous impacts of climate change on livelihoods, food and water sources, and often cultural identity – important factors and pressures to understand and address, for the reinforcement of a socially cohesive and resilient society.

WHY IS SOCIAL COHESION IMPORTANT?

Social cohesion is one of the key components of a resilient community. High levels of social cohesion can lead to high levels of cooperation and community interaction through decreasing isolation among residents, and enhanced engagement in civic tasks (like voting and obeying the law) and shared community goals. It can also lead to high levels of social capital (the network of relationships that allow a community to function efficiently) of which members can trade and utilise to respond to climate related issues. This applies to being prepared for climate events, responding to them both during- and post-event, and adapting for the future.

By and large, communities with high levels of connectivity and trust are in a much better space to respond to extreme events. An example was seen in New Zealand during the Auckland Anniversary floods in 2023, when local volunteers checked in on 35 vulnerable families in the Mount Roskill area and took special care with elderly community members who they knew had limited social networks.

On the other hand, a disparate community with low levels of connectivity, trust and cohesion can make individuals with limited support networks much more vulnerable to isolation. The community may also struggle to collectively respond and make decisions in the aftermath of events, delaying recovery and reducing the effectiveness of long-term adaptation. Too often we hear of situations during climate events such as heat waves where vulnerable elderly members of the community who live alone do not have the resources to respond or the social connections that would mean they are checked on, which often results in serious medical events.

THE NATURE OF POTENTIAL IMPACTS

The impacts of climate change on communities' social cohesion can be immediate or gradual. An example of a direct and sudden impact would be a climate event that causes high levels of displacement and damage to key community infrastructure. Depending on the resources of the community – both physical and social – and its governance, these conditions can be temporary or permanent. The impacts can then be amplified, depending on the existing reliance on the piece of community infrastructure, individual member or household. For example, if the community member who becomes displaced plays a key role in the community, such as a voluntary ambulance officer, local digger operator or chair of community committees, this can disrupt the way the community functions particularly in smaller and more remote communities.

More gradual impacts on social cohesion can include climate-driven resource scarcity and arising conflicts. For example, on many small islands and in developing nations, water scarcity is worsening due to climate change, and water is a key resource supporting livelihoods such as handicrafts and horticulture. This can result in theft of collective water resources, causing discontent amongst the community and a distrust amongst members.

Climate-driven migration or managed retreat also have very real impacts on social cohesion. Due to increasing frequency of climate events or resource scarcity, or both, community members with the means to move may start voluntarily migrating out of high-risk areas or are directed to move through managed retreat processes, with those left behind feeling more isolated.

Diminishing population numbers may result in the closure or reduction of community facilities and services, further impacting those remaining. Climate migration can also impact the receiving community depending on the ability to absorb new arrivals, both in terms of resources and community cohesion. Key considerations when making adaptation decisions to maintain social cohesion

1. Take stock of the current state of social cohesion

For those involved in adaptation planning, a critical first step is understanding the level and nature of social cohesion existing in the community. This includes the levels of social relationships, connectedness, equity and common values.

2. Create a safe space for differing views

Achieving collective agreement to adaptation responses is complex, and processes (such as managed retreat, involving the purposeful and coordinated movement of people and buildings away from risks), can expose stark differences in perspective and tolerance, presenting significant challenges to community cohesion.

Any processes implemented to address climate issues in communities need to consider this potential conflict and how to manage it, in a way that legitimises and creates space for differing views but does not inadvertently create scenarios that pit people against each other.

3. No two places or situations are the same

Some communities, due to geographic location, are quite compact and distinct in their identity and others are intertwined with other communities both in terms of relationships, dependencies, and functions.

For any assessment of community impacts, vulnerability or planning for community-level interventions, it is important to understand how a specific community functions. This will strongly influence the process in terms of how the community is engaged, its collective decision making, the current state of social cohesion to build upon for resilience, and the level of anticipated impacts – both of climate change and adaptation strategies.

4. Don't lose sight of those left behind

When considering managed retreat or classification of properties post-disaster, the focus is typically on those who need to move. However, the impacts on social cohesion are not just for those who leave but those who are left behind. It is important to ask questions such as who is leaving the community and what roles do they play within their community? How can the remaining community be supported to transition and manage this change; if this is a planned retreat is there succession planning for key roles or support that can be provided? What are the connections and dependencies of those leaving and staying?

5. Consider opportunities to facilitate social cohesion in newly relocated-to areas

During processes which challenge social cohesion for both the community that people are leaving, or the new location for a community facing managed retreat, consideration on how to facilitate social cohesion is important. This could be through reallocation of vacated sites for community facilities or gardens, local events, and making space for community focal points in new land allocated for managed retreat. The key is how to facilitate people coming together to build and rebuild relationships, sense of community and a shared purpose.

LONG-TERM ADAPTATION

Social cohesion plays a vital role in community resilience, and the ability for communities to respond to the impacts of climate change.

Communities with high levels of connectivity and trust are better equipped to make socially sustainable decisions and adapt for the future. On the other hand, a lack of social cohesion can make individuals more vulnerable and hinder collective decision-making during and after climate events.

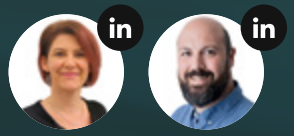
All long-term adaptation strategies need to assess the existing social cohesion of affected communities (both those in high-risk areas as well as communities where people relocate to) and how impacts can be minimised through adaptation processes. By prioritising social cohesion, we can build resilient communities that can more effectively respond to the challenges of climate change while maintaining a strong sense of unity, collaboration and connection.

IN FOCUS

Resource stewardship

INSIGHTS FROM TANIA HYDE, TECHNICAL DIRECTOR & CIRCULAR DESIGN LEAD – TRANSPORT & INFRASTRUCTURE AND SCOTT SMITH, TECHNICAL DIRECTOR – SUSTAINABLE BUILDINGS

Earth's renewable and non-renewable natural resources include air, water, soil, minerals, plants and animals. All these are required for ecosystems to thrive. When these resources (natural capital) fall below critical levels we can see ecosystems begin to fail sometimes beyond critical levels or 'tipping points'.



Many nations recognise this and are now including biodiversity targets within their climate change strategies, aiming to protect and restore natural habitats, promote sustainable land use practices, and conserve biodiversity hotspots.

The conference discussed the importance of transitioning to sustainable lifestyles and sustainable patterns of consumption and production in efforts to address climate change. The integration of nature-based solutions and circular economy approaches into climate action plans, which utilises the benefits of ecosystems to mitigate and adapt to climate change. The urgent need for investing in circular solutions, in parallel to delivering energy system transition is key, as the acceleration towards an economic and energy transition occurs across the globe.

At Beca, the way we think about resources – both natural and manufactured – is referred to as Resource Stewardship.

To drive improvement, we try and apply a circular economy lens, which considers the relationships between often disconnected systems, helps close material loops, reduces waste, and minimises resource extraction, emissions, and energy consumption. It encourages the design of products and processes that are restorative and regenerative, aiming to maintain the value of resources for as long as possible.

The balancing of material demand, with a finite natural resource will come under increasing pressure. Our aim is to help find opportunities for our clients to have access to resources in the future, through how we design their assets and products, rethink business needs and supply chains, and consider wider systems to prioritise resource efficiency and waste reduction.

University of Auckland's B201 is an exemplar of resource stewardship in the construction sector, with key decisions heavily influenced by a circular economy lens.

AT A GLANCE

- COP28 highlighted the interconnectedness between climate change and resource consumption, and the need for sustainable practices that go beyond reducing greenhouse gas emissions, including addressing natural ecosystems and biodiversity conservation in the context of climate change.
- The urgent need for investing in circular solutions, in parallel to delivering energy system transition, is key, and businesses have the power to redesign their assets and products, rethink business needs and supply chains, and consider wider systems to prioritise resource efficiency and waste reduction.
- Read about an adaptive re-use building project, that significantly reduced embodied and operational carbon emissions by over 50%, by utilising existing building elements.

CASE STUDY

REDUCING CARBON EMISSIONS THROUGH ADAPTIVE REUSE ON BUILDING B201

The University of Auckland's 50-year-old former Social Sciences Building (B201) was given a new lease of life after being upgraded and refurbished to meet the needs of a modern university environment.

Seeing the value in the existing buildings superstructure and foundations, Beca and our design partners helped University of Auckland deliver an adaptive re-use project. This approach slashed embodied and operational carbon emissions by more than 50%, significantly reduced the quantities of virgin materials and delivered a state-of-the-art teaching, learning, research and administration space for three faculties. Where new areas were added to the building a mixture of timber structure, recycled steel and low carbon concrete supply chains was used to limit impacts.

The main atrium is designed to be readily disassembled into constituent products in the future, increasing its end-of-life value and helping it contribute to a more circular future. It achieved the highest ever Green Star rating in NZ (93 points / 6 Star) and is recognised as "world leading" by the NZ Green Building Council.

Whilst integrating resource stewardship and circularity principles into a design solution is an important step, a wider change is needed.

An explicit outcome from COP28 noted 'the importance of transitioning to sustainable lifestyles and sustainable patterns of consumption and production in efforts to address climate change, including through circular economy approaches, and encourages efforts in this regard.'

A circular economy is where we need to head, and this cannot be delivered by individual businesses simply addressing their own resource stewardship strategies. Governments, through policies and standards, play a crucial role in driving the shift towards a more circular economy – one that appropriately values the manufactured resources we already have and incorporates the true cost of natural resources and environmental impacts into decision making.

At the conference various actions were proposed, including the development of policies that support circular economy principles, the establishment of financial incentives for circular businesses, and the promotion of "radical collaboration" between government, businesses, and civil society to share best practices and knowledge.

A key learning from our project experience is to intervene early before a product or project is commissioned. This new mindset is not just about efficiency, it is about a new approach, new business models and transforming our thinking.

We need to challenge ourselves on what really needs to be built or created, how do we extend the materials life for several design uses, not just the initial one. This requires us to examine our supply chains, what and how we design, and what materials we are using.

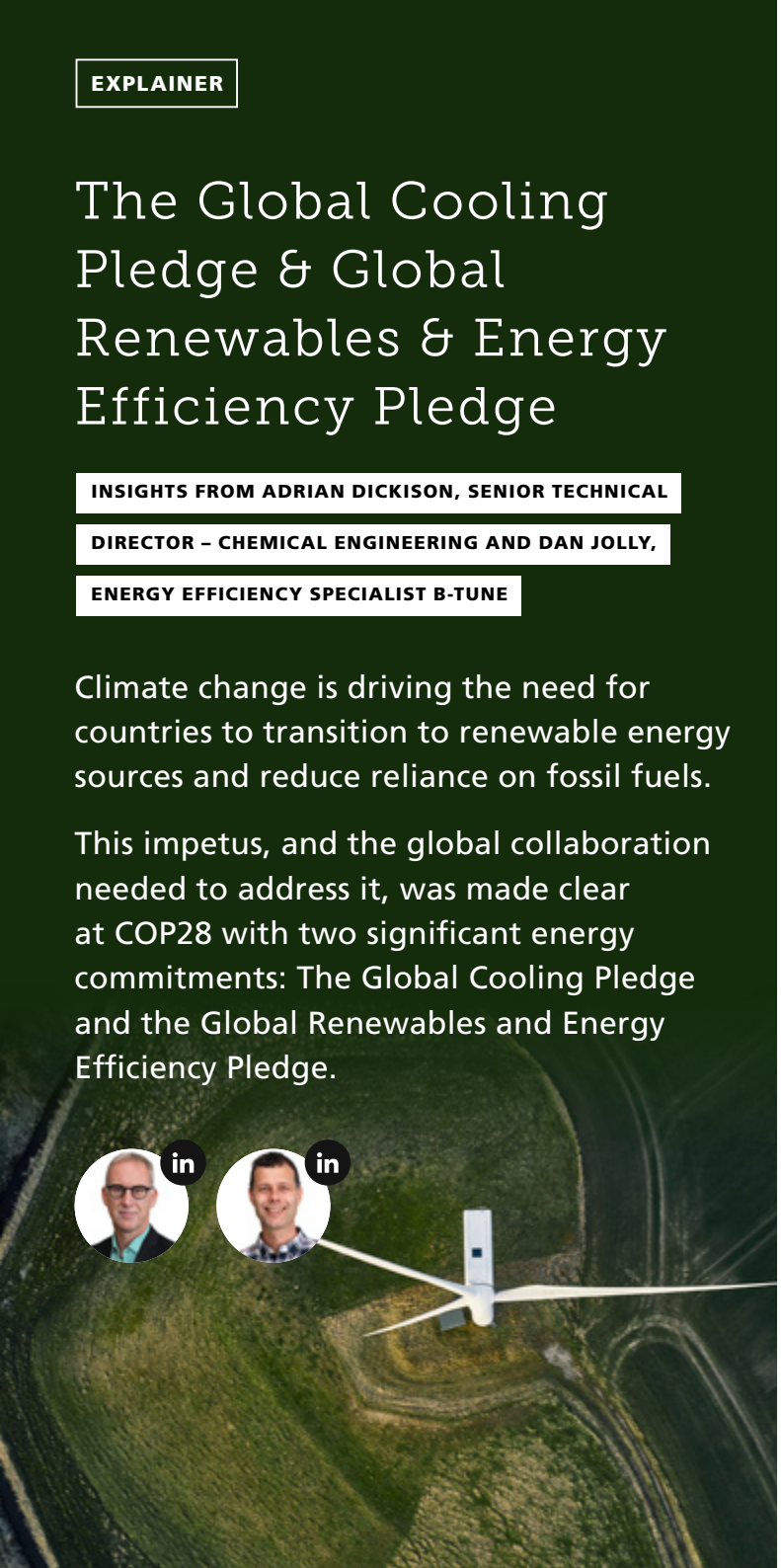
EXPLAINER

The Global Cooling Pledge & Global Renewables & Energy Efficiency Pledge

INSIGHTS FROM ADRIAN DICKISON, SENIOR TECHNICAL DIRECTOR – CHEMICAL ENGINEERING AND DAN JOLLY, ENERGY EFFICIENCY SPECIALIST B-TUNE

Climate change is driving the need for countries to transition to renewable energy sources and reduce reliance on fossil fuels.

This impetus, and the global collaboration needed to address it, was made clear at COP28 with two significant energy commitments: The Global Cooling Pledge and the Global Renewables and Energy Efficiency Pledge.



The International Energy Agency and the International Renewable Energy Agency estimate that for the world to keep warming well below 2°C, and pursue efforts to limit warming to 1.5°C, then a tripling of renewable energy capacity is needed by 2030, and a doubling of the annual rate of energy efficiency improvements.

In New Zealand only around 30% of our total consumer energy requirements (which includes transport and industrial sectors) is currently generated from renewables. In Australia the figure is rather worse, with just 9% of Australia's primary energy mix coming from renewables.

> "At Beca, our focus on future energy systems acknowledges that the infrastructure, technologies and approaches used, will continue to evolve. There is already a great shift towards sources such as solar, wind, and hydro power to reduce greenhouse gas emissions, increase energy security, and create new economic opportunities."

This can involve the construction of new renewable energy facilities, as well as the upgrading of existing infrastructure to support the integration of these sources into the energy grid.

The opportunity lies with new energy sources that are affordable, reliable and sustainable – and in the cross-sectoral collaboration and system transformation needed to deliver it.

GLOBAL RENEWABLES AND ENERGY EFFICIENCY PLEDGE

The commitments outlined in the Global Renewables and Energy Efficiency Pledge are quite specific:

- Commit to tripling renewable energy capacity by 2030, or at least 11,000 GW (taking into consideration different starting points and national circumstances).
- Commit to work together in order to collectively double the global average annual rate of energy efficiency improvements from around 2% to over 4% every year until 2030.
- Commit to put the principle of energy efficiency as the "first fuel" at the core of policymaking, planning, and major investment decisions.

GLOBAL COOLING PLEDGE

The COP28 Global Cooling Pledge aims to address the issue of sustainable cooling as a climate mitigation and adaptation strategy.

With a focus more specifically on air conditioning and refrigeration, one of the key aspects of the Global Cooling Pledge was a commitment for nations to work together to reduce cooling-related emissions across all sectors by at least 68% globally relative to 2022 levels by 2050.

Ratification of the Kigali Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer by 2024, support for early action on HFC consumption reduction, and publishing national cooling action plans are among the other commitments made by participating countries.

The Global Cooling Pledge recognises that mechanical cooling accounts for 20% of global electricity consumption, and is a top driver of global electricity demand, as well as of generation capacity additions to meet peak power demand.

Another point the Global Cooling Pledge recognises was that in the International Energy Agency's Net Zero Emissions by 2050 Scenario, the average efficiency rating of air conditioners sold would need to be at least 50% better than the current installed efficiency by 2030 in all markets, consistent with the concept of energy efficiency and savings as the "first fuel" to achieve net-zero emissions by 2050 at the latest and energy transitions.

SO, HOW WILL INDUSTRY RESPOND?

Overall electricity demand is rapidly increasing as fossil fuel heating is replaced with renewables sources, requiring investments in generation and transmission as well as the end user's equipment.

Improving industrial and commercial electricity consumption efficiency to reduce the need for a massive electricity network build-out, corresponds closely with the "first fuel" concept.

In recent years, energy efficiency and savings as the "first fuel" has been a strong focus for us at Beca, and in our work with clients across the Buildings and Industrial sectors in particular.

We are developing tools not only for large commercial office building as in the case with BTune, but also for industrial applications in the control of refrigeration plants using Maestro™.

CASE STUDY

BTUNE: OPTIMISING BUILDING ENERGY EFFICIENCY

Energy used for operating a building is a huge consumer of energy and accounts for 27% of global emissions.

Existing methods to improve building efficiency, such as energy audits, are often dependent on local knowledge and executed at a piecemeal level. BTune is changing that, with a scalable means of not only monitoring the performance a building but controlling the equipment in the building to improve efficiency while maintaining comfort.

As an example, BTune was deployed in a large office building that was already deemed to be energy efficient. After analysing more than 200 individual pieces of equipment, BTune identified 12 Energy Savings Opportunities. Once approved by the building operator, BTune was able to autonomously roll-out new strategies to address these opportunities, delivering additional whole building energy savings of an average of 27% each month.

What makes BTune a step-change from existing methodologies is that it not only makes the initial optimisations, but then continuously monitors the building in real time to maintain this new optimal performance. This is essential for buildings to stay on track to meet carbon goals while optimising both performance and comfort.

Technology like BTune is making it possible to scale energy efficiency work to the scope required to meet Net Zero milestones. What's more, by removing a substantial portion of the human effort historically required to achieve these types of results, BTune enables buildings to take on these projects with no upfront costs while paying for the service out of the savings it generates for them, transforming energy efficiency from a challenging problem to a solution that is good for business.

Credit: Studio Pacific Architecture

CASE STUDY

MAESTRO: LOWERING COSTS AND CARBON EMISSIONS FOR INDUSTRIAL COLD STORAGE

At Beca we have developed an energy efficiency control system for large refrigeration plants. This tool - Maestro™, continuously optimises the operation (without impacting cooling or the cold chain) and identifies issues reducing efficiency such as compressor wear, condenser fouling and air ingress.

Maestro™ can make positive contributions to energy efficiency in the range of 10-15% on typical plant. Not only does it save energy, but it can help operators and maintenance contractors perform rational maintenance based on data-driven business cases by identifying the magnitude of the losses.

As an example, we have identified operating refrigeration screw compressors drawing in excess of 20% more power than in the brand-new condition. With this data we are able to assess whether or not there is an economic case for complete compressor block replacement rather than simple mechanical integrity repairs. So what could be better? – a way of saving operating cost as well as contributing to global efficiency goals. Good enough for a plant manager to remain cool under pressure.

To recap, in order to meet the goals of the Paris Agreement, significant emission reductions must be achieved globally by 2030, with a focus on addressing emissions from cooling activities.

It's exciting to see the energy efficiency component of the renewable energy pledge brought to attention. A lot of our work is in this space – both in our buildings and industrial businesses.

We have an opportunity to work together to optimise clients' current infrastructure and reduce their energy load. This is an ongoing process, that we will need to have an increased focus on into the future.

While no easy task, with coordinated international action on sustainable cooling, and estimated 78 billion tonnes of CO2e can be saved between now and 2050, improving the lives of hundreds of millions, and realising huge financial savings.

Overall, the pledges reflect a collective commitment to accelerating the global transition towards renewable energy and energy efficiency. The pledges emphasise collaboration and international cooperation to significantly increase the supply of renewable energy, while also reducing cooling-related emissions and expanding access to sustainable cooling.

Comprehensive domestic actions, international collaboration on renewables, energy efficiency and value chains, technology development, financial support, accessible financing mechanisms, technical support, capacity building, and cross-border grid interconnections are among the cooperative actions identified.

We all have a role to play: COP28 & far beyond

INSIGHTS FROM JIMMY WALSH, INDUSTRIAL GROUP DIRECTOR

COP28 shed light on the complexity, interconnectivity, and challenges we face to adapt and mitigate the worst effects of climate change.

The conference highlighted the diversity of cultures and perspectives from all over the world and provided opportunities to connect and learn. It was important to us at Beca to be there, to show both our support and our drive to provide practical, and innovative solutions for our clients and communities in New Zealand, Australia, Asia and across the Pacific.

COP28 also presented strategic opportunities for the region, reinforced by the delegation's support for the official bid by Australia and Pacific Island neighbours to co-host COP31 in 2026.

For me it was a great opportunity to connect business, government and key stakeholders. This included international partners and clients with whom we have important relationships, and leaders based in locations as far afield as Houston, London, Dubai, and Copenhagen.

Climate change is a global issue that affects us all, and the conference served as a stark reminder that each sector, country, and individual has a crucial role to play. We will need to see serious progress and we must support and stand alongside those countries facing existential threats from sea-level rise and forecast climate change-driven weather events, and climate migration.

The scale of the climate challenge requires a whole-of-humanity response, which can only be achieved when we come together, with purpose and a vision for the future. While daunting, such scale also offers great opportunity for countries, governments and the private sector, to change how they design and deliver infrastructure, and for refreshed focus on nature-based solutions, biodiversity, and much-needed transition finance.

> "As we move forward, the imperative is to convert lessons learnt into actions taken – our future will not be secured without practical, on-the-ground solutions for industry, energy, transport, water, and urban form."

– Jimmy Walsh, Industrial Group Director.

COP28 INSIGHTS

When it comes to combatting climate change it is evident that every sector is impacted by common themes, including technology like carbon capture, the availability of finance, regulatory setups, and network effects.

- **Finance availability and the emergence of the Global South**

One of the key takeaways from COP28 is the growing advocacy of the Global South, which comes with urgent developmental needs. Crucially, these regions need to channel their growth down a green path – a task that will require both significant incentive for change, and financial investment to implement it. There's an urgent call for more affordable, plentiful financing options for greener initiatives. Key to this process is averting a trajectory that leads to carbon-intensive development that would be locked in for the next 30 years or more.

- **Network effect and the power of shared knowledge**

Another important theme was the significance of technology, and of sharing knowledge and data to drive innovation and efficiency. When large global private companies come together with public sectors to share extensive datasets, it can revolutionise the planning processes of the built environment and energy systems. Consider also the transformational role of Artificial Intelligence to filter, categorise and interpret this ocean of data much faster than previously imagined possible, and the potential for solutions in timeframes we could previously only dream of. This shared wisdom accelerates the shift towards improved environmental outcomes that align with development needs worldwide.

- **The catalyst role of the private sector**

COP28 underscored the importance of the private sector in the climate change fight. Represented in full force, businesses rallied their marketing machinery and professional expertise to reinforce their commitment to greener technology. Although the question remains whether this shift is occurring at the necessary volume and pace, it's clear the wheels of change are in motion.

- **Cause for hope**

Despite the old adage that when all is said and done, more is said than done – there is hope. As an example, 80% of buildings that are needed on the continent of Africa are yet to be constructed. This example shows the scale of opportunity for future green initiatives. Another example is retrofitting buildings has proven to be up to 80% less impactful from a carbon standpoint, giving us another potential pathway to reduce carbon emissions.

OPPORTUNITY TO MAKE A DIFFERENCE

Through the course of this report, my colleagues across Beca have dived into many of the key insights and threads of change needed across various sectors.

We've explored Beca's focus areas of decarbonisation, adaptation and resilience, and resource stewardship in the context of COP28 discussions.

We've also discussed the clear need for continued investment and focus on renewable energy development, in the Asia Pacific and around the globe, for its potential for reducing emissions.

We see real opportunity to work with our clients and network of partners to optimise solutions and influence change. This starts with great relationships, with understanding each other's businesses, operations and ambitions, listening and collaboration.

In New Zealand and Australia we are supporting the decarbonisation journey for several hard-to-abate sectors like steel making (which comprises 8% of total global emissions), aviation and agriculture.

Many governments around the world are taking a proactive approach to support in the transition. For these governments, they view the transition as a competitive advantage and have an eye on the long-term for their countries.

In working together, we are all on the journey to help combat climate change, and we are all part of the solution. At Beca we embrace the opportunity to partner with clients, partners, colleagues and the community to deliver a positive vision, and a sustainable, resilient future that we can all be proud of.

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