

CLIMATE ACTION PLAN 2019-2022 TE MAHERE ĀHURANGI O NGĀ TAU 2019-2022

For the Queenstown Lakes District | Mō Te Rohe O Whakatipu

A MESSAGE FROM THE MAYOR HE KARERE MAI I TE MEA

**“I cannot do all the good that the world needs.
But the world needs all the good that I can do.”**

— Jana Stanfield

As guardians of some of the most iconic natural landscapes and in a unique position of influence, both nationally and internationally, the importance of our Climate Action Plan for me is immense. With this work, QLDC embarks formally on a journey toward a major organisational behaviour shift which we hope will lead the way for our residential and business communities.

Through the consultation, and in my role as Mayor generally, it has been a privilege to witness the passion and commitment of the environmentally minded already doing great things in our district. To those educating, enabling and advocating, I pass my sincere thanks for truly embracing the principals of kaitiakitaka and the principles of Vision Beyond 2050.

Challenges of this magnitude can easily feel insurmountable. Indeed this is the greatest challenge facing our modern world. However, we as a district are rich with innovators and influencers. We have accomplished many world firsts and attract many great thinkers drawn here by an enviable and inspirational lifestyle. From our small piece of paradise at the bottom of the planet, if we all do our part, we can lead the ‘Mexican wave’ of action towards zero-carbon climate resilient communities, destinations and economies.

Let’s be aspirational in our thinking and in our doing. ‘The benchmark for sustainable tourism’ and ‘Aotearoa New Zealand’s hub of public transport innovation’ are sentiments that would look good on our district. They would attract values-driven newcomers and visitors whilst enhancing life in the Queenstown Lakes District for our communities.

The voices of those who will inhabit our home long after we are gone are asking us to fly less, drive less and eat fewer animal products to reduce global emissions. These are the things we can do day-to-day which will have the biggest impact. It is my belief that QLDC’s Climate Action Plan will also make impactful change and inspire our communities to come together, share their knowledge, and be part of the solutions.

Kia kaha takata whenua.



Jim Boulton ONZM
Queenstown Lakes District Mayor



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Te Reo Māori translation:
Please note, QLDC uses the local Kāi Tahu dialect which replaces 'ng' with 'k', e.g. tākata (people) instead of tāngata.

INTRODUCTION WHAKATAKIKA

According to the 2018 Intergovernmental Panel on Climate Change (IPCC) Special Report, we have less than a decade to act until the effects of climate change are irreversible. Now is the time to stop talking about climate change and to start taking climate action.

On 27 June 2019, the same day as the draft version of this Climate Action Plan (CAP) was approved for public feedback, Queenstown Lakes District Council (QLDC) declared a climate and ecological emergency¹. In doing so, we joined many other local authorities in New Zealand and across the world committed to taking action to address the effects of climate change on the people and landscapes we represent.

The declaration means that QLDC will be held to account for ensuring that climate change considerations are reflected in decision making, policy setting, projects and service delivery.

This CAP is the first of many for our district. It starts to identify ways in which we can reduce emissions and sets a strategic direction for addressing climate change impacts. It incorporates feedback that we received on the draft plan and is designed to remain flexible as we gain a greater understanding of the challenges we face and the technological advances that will help us develop potential solutions.

Updated plans, each looking ahead to the next three years, will be published annually in line with Council's Annual Plan budgeting cycle.

Each CAP will refocus and accelerate our existing efforts as well as kick-starting a range of new initiatives.

“Our goals for the CAP are to achieve net zero carbon emissions by 2050 across the whole district and be resilient to the local impact of climate change across the whole district.”



The first part of this plan sets the local and global context, provides background to this first plan for our district, and explains how we will deliver it and how we will measure our success.

The second part outlines the work programme itself. It provides an overview of five key outcomes supported by a range of actions over the next three years. Each outcome is underpinned by a keystone action, which is central to its achievement.

The Purpose of the Plan

The purpose of the CAP is to help QLDC rise to meet the challenge of the climate change emergency and to:

- Invigorate a network of partners and working groups who will collaborate to deliver the CAP
- Ensure our community understands and is prepared for the variety of different climate change impacts
- Build momentum and demonstrate leadership locally, regionally and nationally
- Measure success through effective monitoring and evaluation
- Change the way we work, across all activities
- Underpin the integrity of New Zealand's global climate change action reputation.

The CAP provides a clear, short-term (three year) approach that will lay the foundation for the successive plans over a longer term. It provides a benchmark against which we can monitor our progress.

¹ <https://www.qldc.govt.nz/media/jjratjtd/0c-confirmation-of-mins-of-27-june-2019.pdf>

THE ROLE OF QLDC TUHINGA O MUA QLDC

Considerable work is already underway in many of our core activities (see appendix 1). For example, climate change, emissions reduction, and resilience are a central focus of our 30-year infrastructure asset management strategy.

Nonetheless, we recognise there's far more to do in terms of activities that will help us adapt to climate change and mitigate its effects.

We also acknowledge our district plays an important role in shaping New Zealand's international reputation. As such, it's important for us to reflect and support the provisions of the Climate Change Response (Zero Carbon) Amendment Act ("Zero Carbon Act") passed by parliament in 2019.

As this is the first CAP for the district, it's essential we get off to a good start. The plan is designed to be achievable, realistic and aiming for appropriate goals.

Essential Collaboration

QLDC has a big role to play but we cannot do this alone. The CAP can only be achieved if we take a collaborative approach with our community, partners and stakeholders.

The CAP sets out Council's work programme for the next three years and how different groups working together will help achieve this.

QLDC's specific role depends on our ability to act in three different spheres:

- Sphere of Control - our operations and policy
- Sphere of Influence - our relationships and advocacy
- Sphere of Interest - wider social, cultural, environmental and economic factors.

Global Citizen Mindset

Climate change doesn't recognise administrative boundaries, it doesn't discriminate between nationalities, and it doesn't care if a person in our district is a visitor, resident or anywhere in between. Responding to the challenges of climate change requires what has been called a 'global citizen mindset'.

Linking local action to global goals, this CAP sets the direction for reducing emissions, transitioning to a low carbon economy, and preparing for the disruptions of a changing climate so everyone in our district adapts and thrives.

WHAT IS CLIMATE CHANGE?

HE AHA TĒNEI MEA TE TĪNI ĀHUARANGI?

The Earth's atmosphere is made up of oxygen, a large amount of nitrogen, and a small percentage of so-called 'greenhouse gases' (GHGs) such as carbon dioxide (CO₂) and methane (CH₄).

GHGs act like a blanket around the Earth. They trap warmth from the sun and make life possible. Without them too much heat would escape and the surface of the planet would freeze. However, increases in the volume and concentration of emissions have caused the Earth to heat more and its climate to change.

This process is often called global warming but it's better to think of it as climate change. This is because while warming is the main effect, other aspects of the climate also change including more frequent extreme events such as floods, storms, cyclones, and droughts.²

The planet is heating up faster than previously predicted.

² www.mfe.govt.nz/node/16597

Mitigation and Adaptation

Mitigation and adaptation are two methods to limit and manage the effects of climate change. Local government has a role to play in both, as discussed in detail below.

Mitigation refers to reducing the impact of human activities that contribute to climate change, reducing GHG emissions for example, with the objective of limiting climate change for future generations.

Adaptation means adjusting natural or human systems, such as infrastructure networks and the economy, to respond to actual or expected climatic conditions and their effects. Adaptation includes planning for direct impacts on health, safety and wellbeing, such as exposure to heat waves; and indirect impacts such as potential food and water insecurity, and disrupted health services. It also means changing the way we live and work in preparation for a zero carbon future and being open to the opportunities this will bring.

In 2018, the IPCC's Special Report urged "immediate and permanent transitions in land, energy, industry, buildings, transport and cities" to limit warming to no more than 1.5°C. The IPCC states that if current GHG emission rates continue, the 1.5°C limit could be exceeded as early as 2030 or at the latest by 2052, and is urging the global community to reduce GHG emissions as a matter of urgency.^{3,4}

WE NEED TO ACT NOW.

This CAP marks a new benchmark in preparing the district for the challenges ahead and becoming a net zero carbon society.

Further information about the Zero Carbon Act and existing schemes are available in Appendix 2.

³ www.ipcc.ch/sr15

⁴ For the most recent data on atmospheric CO2 go to www.noaa.gov and <https://niwa.co.nz/our-science/climate>





Photography: Tomas Sobek

WHAT COULD CLIMATE CHANGE MEAN FOR OUR DISTRICT?

HE AHA TE KAWEKAWE KI TE ROHE, NŌ TE ĀHUARANGI WHAKAREREKĒ?

To increase our understanding of climate change and help us prepare and adapt, Bodeker Scientific⁵ produced a comprehensive report on implications for the Queenstown Lakes District until the end of the century.

The report made the following predictions under the highest GHG emissions scenario (RCP8.5), which assumes global annual GHG emissions will continue to rise throughout the century:⁶

Impacts	Implications
The district is likely to warm by several degrees, with a projected increase in some areas of up to 7°C.	Higher temperatures may allow for different crops to be grown.
Rainfall distribution and intensity is likely to change, with a greater likelihood ⁷ of more extreme rainfall events.	More heat stress from heatwaves will have adverse impacts on plant, animal and human health.
Precipitation that would previously have fallen as snow and stored in the snowpack will more likely fall more often as rain and contribute to variability in river flows and lake levels.	Range and habitat of native flora and fauna will change, as will the distribution of pests and crop diseases.
A considerable reduction in mountain snowpack and resultant water storage, with snowmelt occurring earlier in each season, will lead to a reduction in the volume of water through the spring melt season in addition to a variability in freeze-thaws.	Timing of seasonal activities such as flowering, breeding and migration will change.
On average, there will be about 12-64 fewer frost days, and up to 60 more 'summer days' each year (i.e. a daily maximum temperature above 25°C).	Increased temperatures will heighten the risk associated with wildfire.
Summers will get warmer with maximum temperatures from December to February increasing by as much as 6-9°C. Summer daily minimum temperatures may increase between 2-3°C depending on location.	Higher intensity extreme rainfall events will lead to an increased likelihood of landslides and flooding.
It will also get warmer over the winter months with the seasonal lowest minimum temperatures increasing by 2-3°C.	Extreme precipitation events during winter may result in very high snowfall leading to road hazards and avalanche risk.
Winter's highest daily maximum temperatures will increase by 5-7°C depending on location.	Fewer winter frost days are likely to reduce hazards from ice on roads.
	A range of likely effects on roading from higher summer temperatures may affect construction and cause heat damage (e.g. damage to bitumen).
	An increase in the likelihood of flood events may increase the potential for greater damage to bridges and roads, and stretch the capacity of stormwater infrastructure.
	Demand for potable water will increase as temperatures rise.
	There will be implications for ski-fields and hydroelectric power generation due to changes in snowfall and snow melt.
	Possible effects from climate change pressures from outside the district could include inward migration.

⁵ www.bodekerscientific.com

⁶ Representative Concentration Pathway is a GHG concentration trajectory adopted by the IPCC for its 5th Assessment Report in 2014. For more information on RCPs refer to the Glossary at the end of the Plan.

⁷ "Likelihood" corresponds to a 66-100% probability according to the IPCC terminology.

WHAT ARE THE FINANCIAL IMPLICATIONS?

HE AHA KĀ RITEKA AHUMONI?

Investing in resilient infrastructure makes good financial sense because it can reduce recovery costs after significant events have occurred. Adaptation is required that takes a whole-of-life approach to infrastructure decisions, which makes good economic sense by accounting for savings over the long term, such as energy efficiency.

Our district is in the relatively fortunate position of not having to contend directly with the effects of sea level rise (which is a problem for many coastal communities) but there will still be noticeable changes (such as reduced snow volumes on the mountains). Our district will still feel the environmental, social, cultural and economic impacts of climate change and there are costs associated with responding to them.

QLDC has been preparing for these impacts by, for example, investing in our 'three waters' network (drinking water, sewerage and stormwater drainage) and upgrading landfill and wastewater operations. We fund this through our operational and capital expenditure.



We will face additional costs by responding to climate impacts more broadly. These costs could include community incentives, ongoing research, funding community initiatives, adjusting infrastructure projects, supporting transformational projects, and employing staff to coordinate climate adaptation initiatives. There are also additional resources and cost associated with the development of emissions reduction and other climate change mitigation initiatives.

Resources and budget to deliver this wider work programme will be sought through Council's next Ten Year Plan process in 2021. In the meantime, we will seek additional resources to fund the CAP through the Annual Plan and by sourcing funding from other sources where possible.

HOW WAS THIS ACTION PLAN DEVELOPED?

I PĒHEA TE TIPU O TĒNEI MAHERE MAHI?

In late 2018, Councillors asked QLDC staff to begin developing a climate change approach for the Queenstown Lakes District. The first task was to listen to the community to understand its concerns and priorities.

Partnership with Kāi Tahu

In 2018, Te Rūnanga o Ngāi Tahu released its climate change strategy, He Rautaki mō te Huringa Āhua o Te Rangi. The strategy's objective is to create a legacy for those whānau to come in response to the effects of climate change. The Council stands beside Kāi Tahu in the belief that amid change and loss there is also hope, and opportunities to thrive.

QLDC worked closely with staff from mana whenua consultancies to develop this draft plan, and we share Kāi Tahu's aspiration to secure the best possible future for us and our children after us.

Community Involvement

Many individuals and groups across the district are committed to taking action against climate change. Shaping our Future, Sustainable Queenstown, Extinction Rebellion, Sustainable Glenorchy and One New Zealand are just a few of those with climate change and net zero carbon emissions high on their agendas.

As well as being a source of information these groups provide opportunities for local people to get involved and make a difference. Representatives from these groups contributed to the development of this plan and will continue to be involved as it is implemented.

In addition, QLDC hosted a series of workshops with the wider community in February and March 2019. Called 'My Place', these enabled Councillors and staff to hear first-hand how local people feel about the impacts of climate change on their whānau and communities, and the need for mitigation activity.

Discussion focussed on mitigation activities such as emissions reduction and sustainability initiatives. The need for more public and active transport came through strongly, as did the need for strong leadership, more information, and proactively becoming a net zero carbon district.

The draft plan

Public consultation on the draft CAP took place in August 2019.

Of the 127 submissions received, 121 were in favour of taking climate action. Most of these stated that the draft did not go far enough and a significant number wanted the reduction of GHG emissions prioritised over other goals.



There was general agreement that a baseline of district-wide emissions should be established as a matter of urgency as this would enable a plan to reduce GHG emissions - a 'reductions roadmap' - to be implemented as soon as possible.

Many respondents called for QLDC to be a leader in reducing emissions and for the CAP to explicitly state the Council's climate emergency declaration. All of these contributions have been reflected in this final CAP.

Our community sent us a strong message in its feedback that continued growth and tourism pose challenges to the draft CAP's goals and also to the target of zero-carbon communities expressed in the Council's 'Vision Beyond 2050' (see below). This final plan will work towards the development of a more sustainable tourism system.

Peer Review

In addition to the extensive input from Kāi Tahu and the community, we conducted a peer review before finalising the CAP. QLDC would like to acknowledge and thank Dr Chris Cameron, Nelson City Council's climate change champion for his support in this regard.

HOW DOES IT FIT WITH QLDC'S OTHER STRATEGIES? HE AHA KĀ HONOKA O KĀ RAUTAKI?

Spatial Plan – Grow Well | Whaiora

The CAP is an integral part of QLDC's future Spatial Plan.

Based around the phrase 'Grow Well' or 'Whaiora' in Te Reo Maori, which translates as 'in the pursuit of wellness', the Spatial Plan emphasises the importance of three key principles in everything we do, namely:

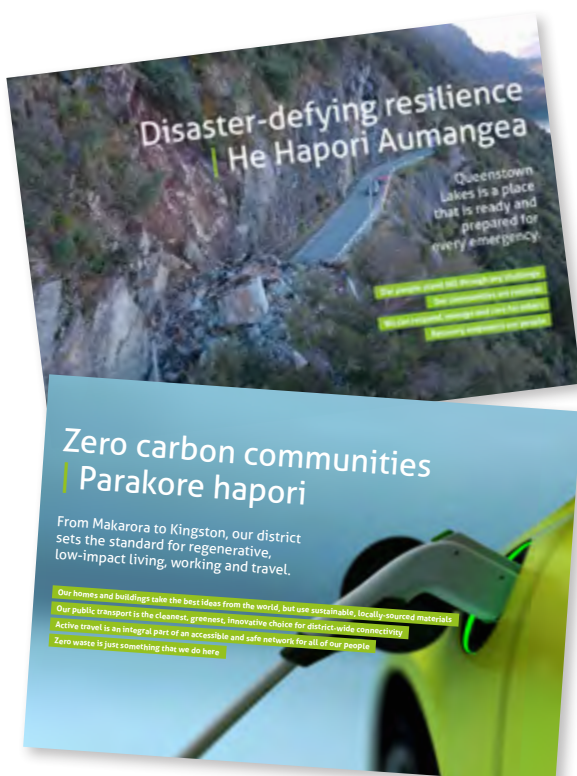
- Sustainability
- Resilience
- Wellbeing.

The environmental, social, cultural and economic wellbeing of our community is central to the purpose of local government, both now and into the future⁸. Local authorities are required to take a sustainable approach to development which also focuses on the quality of the environment and the needs of future generations⁹. Achieving inter-generational equity is central to success.

This CAP is also guided by the principles of the Treaty of Waitangi and the Maori values of kaitiakitanga and manaakitanga¹⁰.

Vision Beyond 2050

The CAP responds directly to the statements articulated in 'Vision Beyond 2050', in particular disaster-defying resilience and zero carbon communities.



Ten Year Plan 2018-28 (Community Outcomes)

Council's Ten Year Plan 2018-28 seeks to achieve a comprehensive range of community outcomes. The following are most relevant to the CAP:

- Communities have a good standard of living
- Efficient and effective infrastructure
- Environmental sustainability and low-impact living is highly valued
- World-class landscapes are protected
- Sustainable growth management
- Communities are resilient and prepared for civil defence emergency events.

Community outcomes will be revised for the next Ten Year Plan (2021-31) and climate change action will be specifically addressed.

Broader Alignment

The CAP aligns with statutory documents in addition to those detailed above including the Operational and Proposed District Plans, Infrastructure Asset Management Strategy 2018-2048, and Waste Minimisation and Management Plan.

It is also informed by non-statutory documents such as the QLDC Quality of Life Survey and Economic Development Strategy.

A number of external factors have informed the CAP including the New Zealand Emissions Trading Scheme, our national obligations under the 2016 Paris Agreement, and the requirements under the 2019 Zero Carbon Act.

For more details on these factors please refer to Appendix Two.

⁸ Local Government Act 2002, section 10 (1) (b).

⁹ Local Government Act 2002, section 14 (1) (h).

¹⁰ Kāi Tahu dialect for kaitiakitanga (guardianship) and manaakitanga (hospitality).

HOW IS THE CAP STRUCTURED? ME PĒHEA TE WHAKAMAHERE?

Key Outcomes

The CAP is structured according to five key outcomes, each supported by actions that are either already underway or planned. The five key outcomes are:

1. The community looks to QLDC for leadership and action.
2. Queenstown Lakes has a low-carbon transport system.
3. Built environment and infrastructure is climate responsive.
4. Communities are climate-conscious and resilient.
5. Our economy and natural environment thrive together.

Local Mitigation

A significant part of the CAP relates to QLDC leading by example by reducing our own emissions, for example from our transport fleet, energy consumption, wastewater treatment and landfill operations.

A group of dedicated Council staff formed the Sustainable Transformational Environmental Programme (STEP) in 2018. STEP aims to inspire the whole organisation to work in a more sustainable way through specific projects such as those targeting waste minimisation and energy efficiency.

It's important to note that QLDC has been progressing climate action initiatives while this plan has been developed. An overview of these is available in Appendix 1.

The CAP also empowers QLDC to invigorate and support local mitigation efforts that tackle the climate change emergency and contribute to a better future for us all.

Local Adaptation

Adaptation responses are typically the responsibility of local, regional and national government as they may require significant investment. This is particularly true of infrastructure, which may require additional investment to build resilience when it comes under increasing stress from extreme weather events.

Forward planning and bold decision making will be needed to prepare for and adapt to a changing climate.

Effective community engagement to share information, build understanding and grow a strong knowledge base will be essential for developing a good response. This will also help build a culture of community and household self-sufficiency, and will reduce dependence on formal emergency responses during extreme weather events.



Members of the Council's STEP group attending the Queenstown Climate Strike in September 2019.

HOW WILL QLDC DELIVER THE PLAN? ME PĒHEA A QLDC TE WHAKATUTUKI I TĒNEI MAHERE?

It's important to note that although the CAP outlines a clear work programme it should not stifle innovation that could help do things better and quicker. Council remains open to feedback and ideas in relation to the delivery and development of the plan. Much will depend on developing strong networks and identifying effective initiatives.

QLDC's role in climate action is to focus on being:

Bold, progressive leaders

- Open-minded and responsive
- Respect the youth voice and value inter-generational equity
- Lead by example and influence key parties positively
- Advocate for change with central government
- Work in partnership with Kāi Tahu
- Lead the conversation about sustainable tourism
- Consider climate change in all policy and decision-making.

Collaborators with the community

- Build strong networks to deliver the plan
- Engage the full spectrum of community members
- Enable and empower communities and business
- Take a 'whole of system' approach to sustainable tourism
- Share responsibilities
- Build preparedness and resilience
- Build fast feedback loops
- Communicate clearly and listen well.

Agents of change

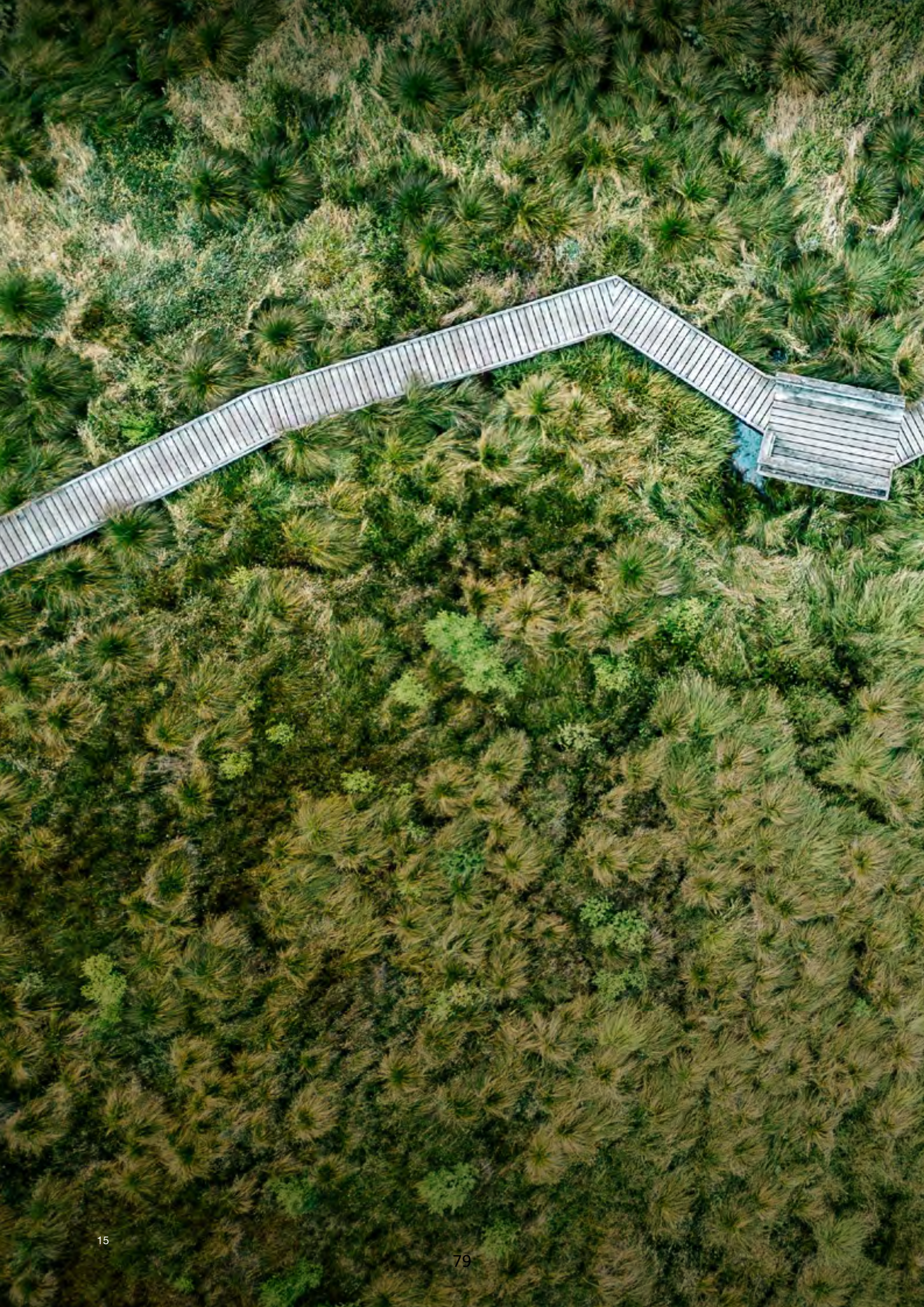
- Embed climate action into the DNA of the District
- Identify and understand transformational opportunities
- Plan and prioritise actions
- Establish baselines, targets and measures of success
- Explore incentives to drive behaviour change
- Assess new technologies
- Identify the workforce needed to deliver new initiatives
- Ensure QLDC staff are fully trained in new practices
- Educate and tell compelling stories.

Effective public servants

- Continuously seek opportunities to make significant emissions reductions
- Apply best practice, value-for-money decision making
- Respond to legislation
- Manage data and information efficiently
- Understand changes to legislation and guidelines
- Identify budgets needed and funding sources
- Manage risks and hazards effectively
- Regulate appropriately
- Monitor and evaluate measures of success
- Report regularly
- Provide core services.



Community engagement at one of the 'My Place' workshops held in February and March 2019.



HOW WILL WE KNOW IF THE ACTION PLAN IS WORKING? MĒNĀ KA EKE PĀNUKU TE MAHERE, KA PĒHEA I TE MŌHIO?

To ensure the plan stays on track, we will identify and set targets and measures within the first six months of the plan being adopted. As increasing data and information becomes available, Council will seek opportunities to consider climate action in the context of community wellbeing.

We will develop a performance framework and identify key performance indicators. Quarterly reports to the Audit, Finance and Risk Committee will identify areas for further action and investment. These will be publicly available.

We will engage with the community on a regular basis to ask if they feel enough is being done to address climate change. We will also include specific questions in our annual Quality of Life Survey.

SUMMARY

KEYSTONE ACTIONS

WHA KARĀPOPOTO O KĀ TINO HOHEKA

keystone /'ki:stəʊn/

noun

a central stone at the summit of an arch, locking the whole together

The CAP is intended to provide an overview of QLDC's actions over the next three years (short term). It is intended to lay good foundations and specific directives for action. The CAP is structured according to five key outcomes, supported by a range of actions. Each outcome is underpinned by a keystone action, which is central to its achievement.



1

OUTCOME 1 - THE COMMUNITY LOOKS TO QLDC FOR LEADERSHIP AND ACTION

Keystone action: Measure the district's GHG emissions and develop an emissions reduction master-plan with science-based targets, and an emissions reduction toolkit. Include sequestration plan.

As a keystone action, the development of the masterplan will be of the highest priority. The masterplan will establish clear milestones for emissions reduction alongside specific, measurable, achievable, realistic and time-bound targets. It will include a carbon sequestration plan, establish an approach to offsetting and create a toolkit for delivery.

2

OUTCOME 2 - QUEENSTOWN LAKES HAS A LOW-CARBON TRANSPORT SYSTEM

Keystone action: Develop transformational options for net-zero emissions public transport.

QLDC will partner with the Otago Regional Council to identify options for net-zero emissions public transport. Opportunities to trial innovative ideas will be explored with a view to wider implementation.

3

OUTCOME 3 - BUILT ENVIRONMENT AND INFRASTRUCTURE IS CLIMATE RESPONSIVE

Keystone action: Utilise appropriate eco design and low impact principles in all QLDC community and operational property projects, including thorough consideration of timber construction.

Working with eco-design experts and third party funders, QLDC will utilise sustainable methods in all upcoming community and property projects in support of both climate change adaptation and mitigation. Lessons will be taken from New Zealand's first passive built community facility (Luggate Hall) and applied to all future projects. Opportunities to utilise timber construction and other sustainable practices will be explored in detail.

4

OUTCOME 4 - COMMUNITIES ARE CLIMATE-CONSCIOUS AND RESILIENT

Keystone action: Undertake a study of the potential health and wellbeing implications of climate change in the district, in preparation for future action planning and resilience-building activity.

Working with healthcare and community groups, QLDC will undertake a study to understand the health and wellbeing impacts of climate change. The research will utilise global evidence bases, trends and forecast data. This information will be used to better understand what resilience means in practice for the communities of the district.

5

OUTCOME 5 - OUR ECONOMY AND NATURAL ENVIRONMENT THRIVE TOGETHER

Keystone action: Work with the tourism system to become a net zero carbon and zero waste destination. Become the most sustainable tourism system in New Zealand.

QLDC recognises that tourism is currently the dominant sector here and is important to the economic wellbeing of residents. Tourism in the district has always been synonymous with innovation and invention, but now the challenge is for the entire system to develop a world-leading approach to sustainable tourism.

1

THE COMMUNITY LOOKS TO QLDC FOR LEADERSHIP AND ACTION

KEYSTONE ACTION:

Measure the district's GHG emissions and develop an emissions reduction masterplan with science-based targets, and an emissions reduction toolkit. Include sequestration plan.

As a keystone action, the development of the masterplan will be of the highest priority. The masterplan will establish clear milestones for emissions reduction alongside specific, measurable, achievable, realistic and time-bound targets. It will include a carbon sequestration plan, establish an approach to offsetting and create a toolkit for delivery.



Phased transition to an electric QLDC vehicle fleet.



1a Strong structures maintaining momentum

Actions: Underway		Networks & Partners	19/20	20/21	21/22	Ongoing
Ensure climate change impacts are embedded into the QLDC spatial planning process.	Kai Tahu All central Govt Partners					
Identify and mitigate QLDC's litigation and insurance risks in relation to climate change.						
Actions: Planned		Networks & Partners	19/20	20/21	21/22	Ongoing
Agree partnership model with Kai Tahu for delivery of CAP.	Kai Tahu					
Establish an independent, multidisciplinary Climate Reference Group (CRG) within three months of the plan being adopted. The CRG will identify key challenges, evaluate best practices, identify funding and agree priority action areas (annual review and revision of priority areas).	Participants TBC					
Advocate to government for legislative reform to support CAP outcomes, providing consistent messages through regular channels and governmental consultative processes.	Central Government					
Measure the district's GHG emissions and develop an emissions reduction master-plan with science-based targets, and emissions reduction toolkit. Include sequestration plan and approach to offsetting.	Climate Reference Group					
Explore opportunities to support zero-emissions energy initiatives as opportunities arise.	Community Groups					
Engage with regional networks and partners to understand the benefit of a regional CAP.	Otago Regional Council Otago Territorial Authorities					
Include consideration of potential inward climate migration in methodology for data and forecasting, i.e. displaced people relocating to the district.	Otago Regional Council Otago Territorial Authorities					
Conduct climate change data & intelligence gap analysis to ensure evidence will be available for effective decision-making and policy advice.						
Develop well-designed collateral and materials to support the CAP.						

1b A climate conscious organisation

Actions: Underway		Networks & Partners	19/20	20/21	21/22	Ongoing
Establish system to monitor and evaluate QLDC's emissions using an established and reputable system. Scope opportunities to include contractors.	To be confirmed					
Ensure procurement policy and guidelines reflect climate action principles i.e. contractors, suppliers, caterers etc.						
Support emissions reduction behaviour already underway within QLDC, e.g. flexible working, Skype meetings, active transport etc.						
Phased transition to an electric vehicle QLDC fleet.						
Develop an organisational travel plan and make changes to the way we work to minimise road and air travel.	All partners					
Actions: Planned		Networks & Partners	19/20	20/21	21/22	Ongoing
Ensure climate change considerations are integral to all Council Reports and decision making.						
Ensure climate change considerations and carbon accounting assessments are integral to all new Business Cases.						
Ensure staff are appropriately trained as to how climate action affects their roles, ensure suitable skillsets are within the organisation i.e. carbon accounting and change management.						
Identify QLDC's emissions-intensive energy uses and plan a programme of replacement with low emissions alternatives.						
Ensure that risks arising from climate change are embedded into QLDC's risk management framework and 10 year plan, in accordance with the Zero Carbon Act.						
Support a range of grass-roots, innovative staff programmes that will support climate action i.e. STEP initiatives to reduce single use cups and plastic bottles.						
Change the way we work through targeted initiatives, including: all QLDC stationery and consumables will be climate and environmentally friendly / reduce use of paper and printing / carbon offset all flights taken by staff.						

2

QUEENSTOWN LAKES HAS A LOW-CARBON TRANSPORT SYSTEM

KEYSTONE ACTION:

Develop transformational options for net-zero emissions public transport.

QLDC will partner with the Otago Regional Council to identify options for net-zero emissions public transport. Opportunities to trial innovative ideas will be explored with a view to wider implementation.



Become an idle-free district by encouraging drivers to switch off engines when parked.



2a Public transport, walking and cycling - everyone's first travel choice

Actions: Underway	Networks & Partners	19/20	20/21	21/22	Ongoing
Spatial Plan to develop future urban design outcomes that reduce reliance on private vehicles.	Queenstown Lakes Spatial Plan partnership				
Develop transformational options for net-zero emissions public transport.	Otago Regional Council				
Provide high quality public transport and active travel infrastructure that is continuously improving.	New Zealand Transport Agency and Otago Regional Council (Way to Go)				
Encourage people to use public transport.					

2b Climate-conscious travel options

Actions: Planned	Networks & Partners	19/20	20/21	21/22	Ongoing
Influence transport service and freight providers to transition towards a net-zero emissions system. Include consideration of hydrogen-based systems.	Private Transport Providers				
Increase electric vehicle charging infrastructure across the district and explore opportunities to develop a regional network.	Aurora Energy				
Advocate to government for measures that will enable greater adoption of EVs and climate-conscious vehicles.					
Undertake an assessment of the aviation emissions profile.	Queenstown Airport Corporation				
Advocate to government for sustainable aviation emissions reduction strategies.	Queenstown Airport Corporation				
Require QAC's airports to demonstrate industry-leading sustainability practices, aligned with the district's emissions reduction master-plan.	Queenstown Airport Corporation				

3

BUILT ENVIRONMENT AND INFRASTRUCTURE IS CLIMATE -RESPONSIVE

KEYSTONE ACTION:

Utilise appropriate eco-design and low impact principles in all QLDC community and operational property projects, including thorough consideration of timber construction.

Working with eco-design experts and third party funders, QLDC will utilise sustainable methods in all upcoming community and property projects in support of both climate change adaptation and mitigation. Lessons will be taken from New Zealand's first passive built community facility (Luggate Hall) and applied to all future projects. Opportunities to utilise timber construction and other sustainable practices will be explored in detail.



Complete New Zealand's first passive build community facility - Luggate Hall.



3a Improved resilience

Actions: Underway	Networks & Partners	19/20	20/21	21/22	Ongoing
Advocate to government for changes to the Resource Management System that take greater account of climate change in land-use planning for the benefit of both adaptation and mitigation initiatives.					
Seek government support and work to influence third party infrastructure providers to reduce the vulnerability of their infrastructure to climate change.	Central Government, Third Party Infrastructure Providers (i.e power and communications)				
Advocate to government for Building Act reform that will improve residential sustainability, efficiency and durability.					

Actions: Planned	Networks & Partners	19/20	20/21	21/22	Ongoing
Integration of climate change consideration into QLDC's Land Development and Subdivision Code of Practice, guiding development practices.					
Ensure land-use planning reflects the need to be responsive to climate change adaptation requirements.	Queenstown Lakes Spatial Plan Partnership				
Conduct a scoping exercise to fully understand the requirement for District Plan changes to encourage climate resilience.					

3b Improved understanding of hazards and vulnerabilities

Actions: Underway	Networks & Partners	19/20	20/21	21/22	Ongoing
Carry out a full assessment of current and future climate hazards and vulnerabilities. Seek inclusion in the District Plan and the organisational risk management system.					

Actions: Planned	Networks & Partners	19/20	20/21	21/22	Ongoing
Develop a preparedness and adaptation plan with regional partners that specifically addresses future climate hazards and vulnerabilities.	Otago Regional Council				
Understand the relationship between climate change, risk management and civil defence planning for all communities. Amend Civil Defence Emergency Management Community Response Plans and Emergency Operations Centre Plans accordingly.	Otago Regional Council, Civil Defence Emergency Management, Community Groups				

3c Reduced carbon footprint

Actions: Underway	Networks & Partners	19/20	20/21	21/22	Ongoing
Utilise appropriate eco-design and low impact principles in all QLDC build and refurbishment property projects, including thorough consideration of timber construction.					
Design and construct New Zealand's first passive build community facility - Luggate Hall.	Third party funders				

Actions: Planned	Networks & Partners	19/20	20/21	21/22	Ongoing
Develop and support best practice urban design principles that move the district towards sustainable development.	Industry				
Deliver an education campaign in relation to space-heating requirements.	Otago Regional Council Community Groups				
Undertake a detailed study of the district's household, organisational and business space heating requirements. Create a staged plan to reduce their dependence on fossil fuels.	ORC				
Include emissions reduction performance targets in the design and construction of infrastructure.	Suppliers				

4

COMMUNITIES ARE CLIMATE-CONSCIOUS AND RESILIENT

KEYSTONE ACTION:

Undertake a study of the potential health and wellbeing implications of climate change in the district, in preparation for future action planning and resilience-building activity.

Working with healthcare and community groups, QLDC will undertake a study to understand the health and wellbeing impacts of climate change. This information will be used to better understand what resilience means in practice for the communities of the district.



Support education to help everyone make better food and consumer choices.



4a Ready to support

Actions: Underway		Networks & Partners	19/20	20/21	21/22	Ongoing
Encourage emissions reduction at all QLDC funded events.	Community groups					
Actions: Planned		Networks & Partners	19/20	20/21	21/22	Ongoing
Facilitate workshops and provide online tools to help the community make better food and consumer choices.	Community groups					
Conduct stakeholder mapping exercise and develop effective community networks.	Community groups					
Build empowered community networks that help to sustain the CAP and other initiatives, whilst informing future action plans.	Community groups					
Provide meaningful support to community change projects that inform, educate and inspire climate action.	Community groups					
Review funding provisions and improve funding mechanisms for community-led climate action i.e. food and water resilience initiatives.	Community groups					
Support and guide the development of local food initiatives.	Community groups, Otago Regional Council					

4b Ready to act

Actions: Planned		Networks & Partners	19/20	20/21	21/22	Ongoing
Ensure community groups are prepared for an increase in extreme weather events that may affect existing systems and processes.	Community groups					
Consider ways to proactively incentivise good practice, climate action and emissions reduction.						
Create a forum for the voice of youth to be heard.	Local schools					
Undertake a study of the potential health and wellbeing implications of climate change in the district, in preparation for future action planning. Utilise Quality of Life survey data.	Healthcare, Community groups					

5

OUR ECONOMY AND NATURAL ENVIRONMENT THRIVE TOGETHER

KEYSTONE ACTION:

Work with the tourism system to become a net zero carbon and zero waste destination. Become the most sustainable tourism system in New Zealand.

QLDC recognises that tourism is currently the dominant sector here and is important to the economic wellbeing of residents. Tourism in the district has always been synonymous with innovation and invention, but now the challenge is for the entire system to develop a world-leading approach to sustainable tourism.



Develop a scheme to encourage visitors to 'give back' to local environmental initiatives, built on model provided at the freedom camping sites.

5a Sustainable tourism system

Actions: Planned	Networks & Partners	19/20	20/21	21/22	Ongoing
Promote Tourism Industry Aotearoa sustainability commitment as a positive initial step for local tourism businesses.	Regional Tourism Organisations Chambers of Commerce Tourism Industry Aotearoa				
Promote the Tiaki Commitment (for visitors) at all public QLDC facilities. Contribute to further development of the commitment.	Tourism Industry Aotearoa				
Support and promote the One New Zealand Again Again (no single-use plastic cup) hospitality industry initiative to extend its reach.	Community groups Industry				
Design a process to understand ecological impacts at specific locations that are under pressure from climate change and/or unsustainable tourism practices.	Industry, Otago Regional Council, Ministry for Environment, Department of Conservation				
Work with the tourism system to become a net zero carbon and zero waste destination. Become the most sustainable tourism system in New Zealand.	Regional Tourism Organisations Chambers of Commerce Central government Tourism Industry Aotearoa				
Ensure that climate change considerations and relevant destination management concepts are incorporated into QLDC's destination strategy.	Regional Tourism Organisations Central government				
As the opportunity arises, advocate to government for a national approach to short term offsetting of international arrivals.	Regional Tourism Organisations Community groups				
Develop a scheme to encourage visitors to 'give back' to local environmental initiatives, built on the model provided at the freedom camping sites.	Regional Tourism Organisations Community groups				

5b climate-conscious business

Actions: Planned	Networks & Partners	19/20	20/21	21/22	Ongoing
Support and enable circular economy initiatives.	Industry				
Encourage businesses to ensure that systems and processes are designed to be resilient to an increase in extreme weather events.	Industry				
Engage with the agricultural/rural community to understand key challenges and best practice.	Industry Groups				

5b Protecting biodiversity and ecology

Actions: Planned	Networks & Partners	19/20	20/21	21/22	Ongoing
Ensure plans are in place to protect and enhance biodiversity in the district. Understand the impact of climate change on flora and fauna.	Otago Regional Council, Community Groups				
Establish a tree valuation framework to more accurately manage and budget for maintenance and investment in tree resources, including assets on the road reserve.					

APPENDIX 1: QLDC'S CURRENT INITIATIVES

ĀPITIHAKA 1: HE AHA KĀ KAUPAPA O TE WĀ

AREA	CURRENT PROJECTS	FUTURE PROJECTS	BENEFITS / CO-BENEFITS
3 WATERS	<ul style="list-style-type: none"> > QLDC Land Development and Subdivision Code of Practice 2018 	<ul style="list-style-type: none"> > Shotover wastewater treatment facility 	<ul style="list-style-type: none"> > Best practice in land development & subdivision infrastructure design > Greater protection from extreme rainfall events > Better storm water treatment > Better water quality > Reduced GHG emissions
ENERGY	<ul style="list-style-type: none"> > Luggate Hall replacement > Shotover energy audit > Queenstown Events Centre energy audit > Queenstown Events Centre heating review 		<ul style="list-style-type: none"> > Building innovation > Community focal point > Smart & viable solution for a growing community > Health & community wellbeing > Passive house design pilot > NZ's first passive house community facility > Energy efficiency / savings > Ventilation and heating improvements
IT	<ul style="list-style-type: none"> > New Print agreement > Ongoing e-cycling of PC equipment > Replacing wireless mouse and keyboards with solar powered or rechargeable units to reduce battery waste > Lobbying providers to reduce packaging waste 		<ul style="list-style-type: none"> > Sustainable procurement > Reduced environmental impacts > Reduce battery waste to landfill > Waste minimisation
LAND USE / DEVELOPMENT	<ul style="list-style-type: none"> > Gorge Road hazards: Considered impact of climate change on hazards. > Proposed District Plan: promotes higher densities in town centres and urban residential areas. > Transport chapter: reduced car parking requirements, more cycle parking and end of trip facilities, providing for public transport > Spatial Plan 	<ul style="list-style-type: none"> > Future plan changes to consider Transit Oriented Development and reducing reliance on cars 	<ul style="list-style-type: none"> > Better management of developments > Improved land use > Better access to facilities and infrastructure > Reduced reliance on cars > Affordable housing / affordable urban land
LANDSCAPE	<ul style="list-style-type: none"> > Winter and tree planting > Removing widening corridors > Community Gardens > Restoring Wetlands 		<ul style="list-style-type: none"> > Reduce fire risk > Increased indigenous biodiversity > Carbon sinks > Protected tussock lands > Improved water quality
RESEARCH	<ul style="list-style-type: none"> > Bodeker report on climate impacts for Queenstown Lakes 	<ul style="list-style-type: none"> > Emissions monitoring system > 30-Year Infrastructure Strategy 	<ul style="list-style-type: none"> > Water catchment plans > Infrastructure and community resilience > Asset management > Community awareness > Economic opportunities
STREET LIGHTING	<ul style="list-style-type: none"> > First phase of LED Street Lighting Retrofit of standard P-Category luminaires 	<ul style="list-style-type: none"> > Complete next stages of Street lighting retrofit of LED luminaires. > V-Category Lighting and decorative luminaires 	<ul style="list-style-type: none"> > Energy efficiency > Reduced travel for maintenance > Fuel savings
TRANSPORT	<ul style="list-style-type: none"> > Wakatipu Way to Go business cases & Masterplans. Focus on: <ul style="list-style-type: none"> • Public transport, including mass rapid transit • Active travel • Parking management • Behaviour change > Bus stop improvements, including Stanley Street Bus Hub 	<ul style="list-style-type: none"> > Exploring use of recycled materials in road construction > Considering electric vehicle infrastructure > Mass Rapid Transport 	<ul style="list-style-type: none"> > Waste minimisation > Reduced emissions > Modal shift to public transport & active travel > Reduced reliance on private cars > Transport resilience – alternative routes / mitigation > Sustainability > More spare time > Better air quality > Less congestion > Fuel savings > Quicker commutes
WASTE MINIMISATION	<ul style="list-style-type: none"> > Support for community based initiatives to minimise waste and reduce carbon > Subsidised composting systems 	<ul style="list-style-type: none"> > New Trade Waste Bylaw (2020) > Construction and demolition waste recovery > Landfill gas capture and flare – Victoria Flats landfill > Enhanced resource recovery facilitation > Organic waste processing facility 	<ul style="list-style-type: none"> > Waste minimisation > Reduced GHG emissions > Household action > Reduced landfill operational costs > Protection from extreme rainfall events > Better storm water treatment and water quality outcomes > Energy efficiency > Workplace transformation
PROPERTY		<ul style="list-style-type: none"> > Project Connect 	<ul style="list-style-type: none"> > Staff / community health and wellbeing > Modeling sustainable building practices
CORPORATE	<ul style="list-style-type: none"> > Queenstown Partnership Housing Strategy > Sustainable Transformation Environment Programme (STEP) 		<ul style="list-style-type: none"> > Better choices for location and type of housing > Better access to employment, education & services > Quality built environments. > Reduced emissions > Climate resilience > Staff engagement and leadership > Organisational transformation
COMMUNITY FACILITIES	<ul style="list-style-type: none"> > Energy efficient audit of swimming pools > Investigation into waste heat capture from wastewater flows to heat swimming pools 		<ul style="list-style-type: none"> > Reduce natural gas (fossil fuel) usage > Passive house innovation for public facilities > Cost savings

APPENDIX 2: BACKGROUND

ĀPITIHAKA 2: TĀHUHU KŌRERO

International context

New Zealand is one of 194 signatory nations to the Paris Agreement, which was adopted under the United Nations Framework Convention on Climate Change (UNFCCC) in 2015.¹¹ The Agreement commits all signatory countries to take action on climate change. New Zealand's Nationally Determined Contribution (NDC) under the Paris Agreement - to reduce greenhouse gas emissions by 30% below 2005 levels by 2030 - will apply from 2021.

At the same time the Paris Agreement was adopted, the United Nations launched a new sustainable development agenda to guide global development over the next 15 years. The two are closely linked. The agenda comprises 17 sustainable development goals including Goal 13 - **to take urgent action to combat climate change and its impacts.**

Local context and local impacts

The Queenstown Lakes District is experiencing very strong economic and population growth and this is expected to continue. The task to reduce emissions in an area of high growth is challenging.¹² Important factors are our distance from other centres and being the country's premier visitor destination. This growth is contributing to the district's higher than average emissions.

However, reductions can and have been achieved in communities similar to ours. Since the adoption of its first Climate Change Action Plan in 2007, the City of Aspen has reduced its net GHG emissions by 7.4% by focussing on the sectors that are the biggest emitters. This is despite a population growth of 5.5%.¹³

Tourism

According to the Davos Declaration on climate change and tourism, everyone has to "rapidly respond to climate change, within the evolving UN framework and progressively reduce its Greenhouse Gas (GHG) emissions, if it is to grow in a sustainable way".¹⁴ This is particularly challenging for the Queenstown Lakes District where the economy is built on international tourism, which relies on aviation.

Climate adaption and mitigation are becoming commonplace in strategic planning in the tourism sector. This plan proposes that Council, Queenstown Airport Corporation (QAC), Regional Tourism Organisations (RTOs), relevant government agencies, the tourism and healthcare sectors, and local community work together to strengthen this approach through collaboration.

District-wide emissions

In 2018, Tonkin + Taylor produced a high level inventory of our district's GHG emissions. Using a 2018 resident population of approximately 37,000, our annual gross emissions per person were estimated at 18.5 tonnes of carbon dioxide equivalent. The national average per person is 17.4 tonnes.

The estimated emissions of a combined visitor and resident population of 62,763 are 10.8 tonnes of carbon dioxide equivalent, which is still significantly more than New Zealand's cities, including Auckland.¹⁵

The sectors where our emissions are high in comparison with the rest of the country are aviation, road transport and waste. Our agricultural emissions are similar to Dunedin's, and stationary energy (electricity and LPG) emissions are at the lower end. This plan includes an action to produce a detailed baseline from which to measure and reduce emissions district-wide, focusing on the sectors and activities where the greatest gains can be made.

Climate change legislation

The Climate Change Response (Zero Carbon) Amendment Act 2019 provides a framework in which New Zealand can develop and implement clear and stable climate change policies that contribute to the international effort to limit the global average temperature increase to 1.5°C above pre-industrial levels. It will enable New Zealand to prepare for and adapt to the effects of climate change.

There are four key actions:

- Set a new domestic greenhouse gas emissions reduction target to:
 - Reduce all greenhouse gases (except biogenic methane) to net zero by 2050
 - Reduce emissions of biogenic methane within the range of 24–47% below 2017 levels by 2050 including to 10% below 2017 levels by 2030.
- Set a series of emissions budgets to act as stepping stones towards the long-term target.
- Require the Government to develop and implement policies for climate change adaptation and mitigation.
- Establish a new, independent Climate Change Commission to provide expert advice and monitoring to help keep successive governments on track to meeting long-term goals.¹⁶

¹¹ As of February 2019, 194 UNFCCC members have signed up to the Agreement. The USA withdrew its support in 2017.

¹² https://pai.org/wp-content/uploads/2012/02/PAI-1293-Climate-Change_compressed.pdf

¹³ Aspen's Climate Action Plan: a roadmap to our sustainable future (Aspen City Council, 2017)

¹⁴ <https://www.e-unwto.org/doi/pdf/10.18111/unwto/declarations.2007.17.02>

¹⁵ Auckland's Greenhouse Gas Inventory to 2015 (Shanju Xie, October 2017)

¹⁶ www.mfe.govt.nz/climate-change/zero-carbon-amendment-act

Emissions trading scheme

New Zealand's method for incentivising the reduction of GHG emissions is via the Emissions Trading Scheme (ETS). This is a market-based mechanism that puts a traded price on GHG emissions at source. It requires that tonnes of carbon emitted by certain sectors (such as industry, electricity and transport) are matched by New Zealand Units (NZUs), also known as carbon credits.

The goal of the ETS is to make businesses (and their consumers) pay for their GHG emissions to encourage them to change their practices or invest in new technology. Forestry owners on the other hand can earn NZUs because their trees absorb carbon. These NZUs can then be sold to polluters for a price that is set by the market.

Local authorities are required to purchase carbon credits to offset the emissions they generate from operational activities, such as landfill and waste water treatment. These costs are passed onto residents through rates and fees such as landfill charges.

Climate action supports a circular economy

Effective climate action offers many transformational co-benefits. As well as preparing for a low-carbon future, it supports the transition to a circular economy which is based on three principles:

- Designing out waste and pollution from manufacture
- Keeping products and materials in use
- Regenerating natural systems.¹⁷

The traditional linear economy on the other hand uses natural resources to make products that are replaced and disposed of as waste.

A circular economy offers numerous benefits over the traditional linear economy as illustrated below.¹⁸

In addition to reversing human impacts on climate change, these benefits include:

- Long-term cost savings
- More local jobs
- Encouraging technical innovation
- Reducing harmful waste.



¹⁷ For more information on how the circular economy works go to <https://www.mfe.govt.nz/waste/circular-economy>

¹⁸ Image source: www.mfe.govt.nz/waste/circular-economy

APPENDIX 3: GLOSSARY

ĀPITIHAKA 3: HE KUPUTAKA

ADAPTATION: Adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities. Various types of adaptation can be distinguished, including anticipatory, autonomous and planned adaptation:

- Anticipatory adaptation - Adaptation that takes place before impacts of climate change are observed. Also referred to as proactive adaptation.
- Autonomous adaptation - Adaptation that does not constitute a conscious response to climatic stimuli but is triggered by ecological changes in natural systems and by market or welfare changes in human systems. Also referred to as spontaneous adaptation.
- Planned adaptation - Adaptation that is the result of a deliberate policy decision, based on an awareness that conditions have changed or are about to change and that action is required to return to, maintain, or achieve a desired state.

<https://www.ipcc.ch/sr15/chapter/glossary/>

CARBON SEQUESTRATION: the long-term storage of carbon in plants, soils, geologic formations, and the ocean. Carbon sequestration occurs both naturally and as a result of anthropogenic activities and typically refers to the storage of carbon that has the immediate potential to become carbon dioxide gas.

In response to growing concerns about climate change resulting from increased carbon dioxide concentrations in the atmosphere, considerable interest has been drawn to the possibility of increasing the rate of carbon sequestration through changes in land use and forestry and also through geo-engineering techniques such as carbon capture and storage.

www.britannica.com/technology/carbon-sequestration

CLIMATE CHANGE: A change of climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and that is in addition to natural climate variability observed over comparable time periods (Proposed Regional Policy Statement for Otago, May 2015).

EARTH SYSTEM: The Earth's interacting physical, chemical, and biological processes. It consists of the land, oceans, atmosphere and poles, and includes the planet's natural cycles - carbon, water, nitrogen, phosphorus, sulphur and other cycles - and deep Earth processes. Life is an integral part of the Earth system as it affects the carbon, nitrogen, water, oxygen and many other cycles and processes.

The Earth system includes human society. Our social and economic systems are now embedded within the Earth system, and in many cases - such as anthropogenic GHG emissions, and biodiversity loss due to deforestation - human systems are the main drivers of change in the Earth system.

www.igbp.net/globalchange/earthsystemdefinitions.4.d8b4c3c12bf3be638a80001040.html

EMISSIONS TRADING SCHEME (ETS): The New Zealand Government's main tool for reducing greenhouse gas emissions.

Its objective is to support and encourage global efforts to reduce greenhouse gas emissions by assisting New Zealand to meet its international obligations, and reducing New Zealand's net emissions below business as usual levels.

www.mfe.govt.nz/climate-change/new-zealand-emissions-trading-scheme/about-nz-ets

GLOBAL WARMING: Greenhouse gases (GHGs) absorb heat from Earth's surface, warming the atmosphere and changing the climate.

Emissions mainly come from combustion of fossil fuels that emit carbon dioxide (CO₂), and agriculture which emits methane (CH₄) and nitrous oxide (N₂O). Carbon dioxide remains in the atmosphere for much longer than other major GHGs. Because of this, today's global CO₂ emissions will continue to influence atmospheric CO₂ concentrations for a very long time.

KAITIAKITAKA: Guardianship and conservation. Traditionally, Māori believe there is a deep kinship between humans and the natural world. This connection is expressed through kaitiakitaka - a way of managing the environment. Kaitiakitaka is the Kāi Tahu dialect equivalent of kaitiakitanga. Today there is growing interest in kaitiakitanga as iwi restore their environment and their culture.

<https://teara.govt.nz/en/kaitiakitanga-guardianship-and-conservation>

LOCAL GOVERNMENT ACT 2002: Section 10 (1) The purpose of local government is - (b) to meet the current and future needs of communities for good-quality local infrastructure, local public services, and performance of regulatory functions in a way that is most cost-effective for households and businesses; (2) In this Act, good-quality, in relation to local infrastructure, local public services, and performance of regulatory functions, means infrastructure, services, and performance that are (a) Efficient: and (b) Effective: and (c) Appropriate to present and anticipated future circumstances.

Section 10 was amended in 2019 to reinstate the obligation of local authorities to "play a broad role in promoting the social, economic, environmental, and cultural well-being of their communities, taking a sustainable development approach" (Local Government (Community Well-being) Amendment Act 2019).

MANAAKITAKA: Hospitality, kindness, generosity, support - the process of showing respect, generosity and care for others.

<https://maoridictionary.co.nz>
Manaakitaka is the Kāi Tahu dialect equivalent of Manaakitanga.

MITIGATION: A human intervention to reduce the sources or enhance the sinks of greenhouse gases

<https://www.ipcc.ch/sr15/chapter/glossary/>

REPRESENTATIVE CONCENTRATION PATHWAY (RCP):

A greenhouse gas concentration trajectory adopted by the IPCC for its fifth Assessment Report (AR5) in 2014. The RCPs are consistent with a wide range of possible changes in future anthropogenic (i.e. human) greenhouse gas (GHG) emissions, and aim to represent their atmospheric concentrations.

RCP 2.6 assumes that global annual GHG emissions (measured in CO₂-equivalents) peak between 2010–2020, with emissions declining substantially thereafter; emissions in RCP 4.5 peak around 2040, then decline; in RCP 6, emissions peak around 2080, then decline; in RCP 8.5, emissions continue to rise throughout the 21st century.

https://sedac.ciesin.columbia.edu/ddc/ar5_scenario_process/RCPs.html

RESILIENCE: The capacity of individuals, communities, institutions, businesses, and systems to survive, adapt, and grow, no matter what kinds of chronic stresses and acute shocks they experience. Shocks are typically considered single event disasters, such as fires, earthquakes, and floods. Stresses are factors that might recur on a regular basis such as water shortages, an overtaxed transportation system, and unemployment.

<http://www.100resilientcities.org/faq/>

RESOURCE MANAGEMENT ACT 1991 (RMA): New Zealand’s main piece of legislation for how we should manage our environment.

SUSTAINABLE TRANSFORMATIONAL ENVIRONMENTAL PROGRAMME (STEP):

A group of QLDC staff who are committed to moving towards zero waste and a more sustainable workplace and district. The group, which was formed in 2018 across all QLDC departments, aims to implement changes at work and at home to achieve this goal.

STRESSOR: A chemical or biological agent, environmental condition, external stimulus or an event that causes stress to an organism.

UNITED NATIONS SUSTAINABLE DEVELOPMENT

AGENDA AND GOALS: In 2015, countries adopted the 2030 Agenda for Sustainable Development and its 17 Sustainable Development Goals.

In 2016, the Paris Agreement on climate change entered into force, addressing the need to limit the rise of global temperatures.

The Sustainable Development Goals are a call for action by all countries - poor, rich and middle-income - to promote prosperity while protecting the planet. They recognize that ending poverty must go hand-in-hand with strategies that build economic growth and address a range of social needs including education, health, social protection, and job opportunities, while tackling climate change and environmental protection.

<https://www.un.org/sustainabledevelopment/>

APPENDIX 4: REFERENCES

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