

5 August 2024

9(2)(a)

Tēnā koe 9(2)(a)

Thank you for your email of 7 June 2024 to Kāinga Ora – Homes and Communities, seeking the following information under the Official Information Act 1982 (the Act):

“...any internal or external advice, exchanges or modelling relating to the development of policies and “interventions” and the expected results of KO’s Emissions Reduction Plan, including any assumptions and sector breakdowns used or developed in the processes of estimation and analysis.”

Your request for models has been refused under section 18(f) of the Act, as the information requested cannot be provided without substantial collusion. The models also requires Power BI dashboard access that we are unable to provide. However, if you have any specific queries relating to modelling the team would be happy to respond to these directly. You may contact them via Tom Kane, Manager Sustainability and Climate Change at the following address:

Tom.Kane@kaingaora.govt.nz

We are able to provide you with three documents relating to the Emissions Reduction Plan.

Please find attached a copy of the Board cover page and paper for the Kāinga Ora Emissions Reduction Plan, as well as a final copy of the Emissions Reduction Plan. Please note that some information has been redacted under section 9(2)(a) of the Act, in order to protect the privacy of staff.

You have the right to seek an investigation and review by the Ombudsman of this decision. There is Information about how to make a complaint at <https://www.ombudsman.parliament.nz> or by freephone on [0800 802 602](tel:0800802602).

Please note that Kāinga Ora proactively releases its responses to official information requests where possible. Our response to your request may be published at <https://kaingaora.govt.nz/publications/official-information-requests/>, with your personal information removed.

Nāku iti noa, nā



Rachel Kelly
Manager, Government Services

Strategy, Risk and Performance Pae Tātaki

Paper no:	2.4
Meeting date:	7 September 2023
Paper author:	Jonty Sanders 9(2)(a) Principal Sustainability Analyst Alex Baker 9(2)(a) Director - Sustainability 9(2)(a)
Business Group:	Strategy, Finance and Policy
Title:	KĀINGA ORA EMISSIONS REDUCTION PLAN

Purpose

1. This paper seeks endorsement from the Pae of the draft Kāinga Ora Emissions Reduction Plan (ERP), prior to seeking endorsement from the Board at their next meeting on 26 September 2023. It also provides additional detail for the Pae on our engagement activities with the wider business. This, combined with the information provided in the Board paper, aims to give the Pae confidence in our approach to developing the ERP.

Recommendations

2. It is recommended that the SRP Pae:
 - a) **Endorse** the attached Board cover paper.
 - b) **Endorse** the attached draft ERP progressing to the Board.
 - c) **Note** the attached draft ERP is compliant with the Carbon Neutral Government Programme (CNGP) requirements and outlines our baseline emissions, targets, and reduction strategies. The ERP will be provided to the Ministry for the Environment (MfE) to be published by 1 December 2023.
 - d) **Note** the attached Board paper which provides the background of our approach to developing the ERP, key decisions made along the way and the potential risks associated with these.

Next Steps

3. We will integrate any feedback the SRP Pae has into the final draft version of the ERP. This, along with the Board cover paper, will be submitted to the Board for review on 14 September 2023.
4. With the Board's endorsement, the ERP will be further finalised to be submitted to MfE and published by 1 December 2023 as per CNGP requirements.

Discussion

- Under section 107 of the Crown Entities Act 2004, Kāinga Ora has been instructed to comply with the Carbon Neutral Government Programme (CNGP). This requires Kāinga Ora to publish an Emissions Reduction Plan (ERP) by 1 December 2023. This must set gross emissions reduction targets that can be achieved by Kāinga Ora, based on the reduction potential within our organisation, and strive to align with a global emissions pathway that limits the global average temperature increase to 1.5°C above pre-industrial levels.
- The SRP Pae was previously provided an update on the Kāinga Ora ERP which included feedback we had received from our engagement with key business groups (refer to SRP Pae Paper 15 June 2023). During this session, the SRP Pae provided their feedback on the ERP and recommended we return with a final draft ERP for them to endorse prior to seeking endorsement from the Board. This draft ERP is attached.

Further engagement

- Since our most recent session with SRP Pae, we have continued to engage with key business groups. More specifically, we have provided senior decision makers across the business with the opportunity to review and provide feedback on the relevant sections of the draft ERP. A table listing all those involved in this process is provided below. All feedback received has been incorporated in the latest revision of the ERP.

ERP Section	Name	Role
Corporate	9(2)(a) [Redacted] [Redacted] [Redacted] [Redacted]	Director – Safety Support & Wellbeing Manager – Business Partnering General Manager – People Governance & Capability Manager – Business Support
Buildings	9(2)(a) [Redacted] [Redacted] [Redacted] [Redacted] [Redacted] [Redacted]	General Manager – Construction & Innovation General Manager – Commercial Construction and Innovation Lead Director – Building Sustainability Innovation & Standards Director – Architecture Manager – Advisory Services

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	9(2)(a) [REDACTED]	Director – Delivery Director – Market Delivery Director – Procurement & Supplier Management Manager – National Investment Strategy General Manager – Delivery Transformation System Creation Lead – HDS Programme Director – Delivery MBU Group Lead MBU Group Lead Principal Advisor – Procurement Transformation Stability Lead Manager – Quality Homes Advisory Manager – Carbon Neutral Housing Programme Director – Acquisitions
Transport	9(2)(a) [REDACTED]	Director – Greenfield & Complex Projects Chief Advisor – Urban Planning & Design Director – National Planning Director – Urban Design Director – Strategy General Manager - Urban Planning & Design Director – Strategic Urban Partnerships Chief Advisor – Urban Development Feasibility & Infrastructure
Infrastructure	9(2)(a) [REDACTED]	General Manager - Urban Planning & Design Director – Strategic Urban Partnerships Director – Infrastructure & Civil Construction Manager – Infrastructure Planning Principal Advisor - Infrastructure & Civil Construction General Manager – Urban Development & Delivery

For Internal Use Only

	<p>9(2)(a) [Redacted]</p> <p>[Redacted]</p> <p>[Redacted]</p> <p>[Redacted]</p> <p>[Redacted]</p> <p>[Redacted]</p> <p>[Redacted]</p> <p>[Redacted]</p> <p>[Redacted]</p> <p>[Redacted]</p> <p>[Redacted]</p>	<p>Director – Greenfield & Complex Projects</p> <p>Principal Advisor – Large Scale Projects</p> <p>Manager – Civil Delivery</p> <p>Manager – National Infrastructure Strategy</p> <p>National Manager – Specified Development Projects</p> <p>Director – Strategy</p> <p>Director – Commercial Management Urban Development</p> <p>Manager – Performance Insights & Governance</p> <p>Programme Manager – Funding</p> <p>Chief Advisor – Urban Development Feasibility & Infrastructure</p>
Entire document	<p>9(2)(a) [Redacted]</p> <p>[Redacted]</p> <p>[Redacted]</p>	<p>Chief Advisor – Strategy, Finance & Policy</p> <p>Senior Advisor – The Puka Ikaroa</p> <p>Policy Manager – The Kuratao</p>

Additional notes to address feedback received during Pae session in July

The base year selected does not allow us to benefit from emissions reduction associated with fleet electrification to date

8. We have selected the 30 June 2023 financial year (FY23) as the base year for our ERP because:
 - a) FY23 is the first year since FY19 where most of the impacts of the COVID pandemic and associated lockdowns have subsided. Normalising for the impact of these lockdowns would be difficult.
 - b) Much of our emissions measuring capability has been developed in the last three years, with many of our models and tools maturing in the past year. Many of these tools rely on bespoke data requests and it is not practical to apply these to retrospective periods – especially those pre-COVID.
9. We recognise that, through our sustainability programme and other activities such as the renewals programme, we have already managed to reduce emissions in some areas over the past few years. These reductions will already be accounted for in our FY23 base year, meaning we won't be able to

take credit for the reductions we have made so far. For example, our fleet electrification programme has already reduced total emissions by ~615tCO₂e (7%) per year but we won't be able to claim this reduction towards our 42% total emissions reduction target.

10. To respond to this, we have included discussion and analysis within the ERP document around the impact of what we have done so far. Our targets for buildings and transport require reductions based on "2019 industry standards" rather than the FY23 base year, meaning that the benefit of the work we have done in the past four years can contribute towards meeting the targets.
11. The corporate target requires a reduction compared to FY23 due to the stringent requirements of the CNGP (42% reduction from base year for "mandatory" emissions). The infrastructure target is also a reduction compared to FY23 because Kāinga Ora has not yet undertaken any work to reduce emissions in this space.

Adequate reflection of broader urban planning and development role

12. There was concern that the ERP did not adequately consider the positive influence that Kāinga Ora has on transport emissions due to our involvement in plan changes and through our Land Development Programme.
13. We have conducted additional engagement with Ernst Zollner (Director – Strategic Urban Partnerships) and Hayley Fitchett (Director National Planning) to ensure that this is accurately captured.

Make clear the different between where Kāinga Ora has control or can play an influencing role

14. We have made it clear what is funded and can be delivered within our existing operating and regulatory settings, versus what is not. We have also highlighted any gaps between the targets Kāinga Ora is being asked to achieve and what we are actually funded for.
15. We have also added into each section how Kāinga Ora control and influence varies between different categories of emissions.

Take credit for emissions reductions related to work Kāinga Ora has done in the past

16. We have quantified the emissions impacts of key Kāinga Ora work programmes that are currently underway, including the Large Scale Projects and Public Housing retrofit/ renewal programme and Healthy Homes Upgrades.

Attachments

17. There are two attachments to this paper:

- a) Kāinga Ora ERP Board cover paper
- b) Kāinga Ora Emissions Reduction Plan – final draft

Signature

9(2)(a)

Alex Baker
Director Sustainability

Emissions Reduction Plan 2023



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Introduction from Kāinga Ora Chief Executive



Andrew McKenzie

The role of Kāinga Ora

The outcomes Kāinga Ora have been tasked with achieving for New Zealand go beyond providing a public home or enabling urban development. Our legislative framework includes objectives and operating principles that require us to have a much larger impact on Aotearoa and the quality of New Zealanders’ lives – including contributing to the creation of sustainable, inclusive and thriving communities by shaping the housing and urban development system.

To achieve those objectives Kāinga Ora’s operations, construction activity and urban planning work has included improving environmental wellbeing as a key strategic outcome from that work.

Investment in the future

We are leading the largest investment in public housing and urban development in Aotearoa for generations. With thousands of houses being built nationwide, and hundreds of hectares of land being developed through our land development and urban growth programmes, we can impact on environmental wellbeing for current and future generations.

We estimate that we have control or influence over 9m tonnes of emissions between now and 2035. This Emissions Reduction Plan outlines

several achievable steps that Kāinga Ora can take to reduce that by between 19 percent and 45 percent. This includes:

- Intensifying housing in places that have good access to amenity and jobs, while incorporating nature-based approaches and significant infrastructure upgrades that support resilience.
- Investing in lifting the energy and design standards of our new homes and accelerate the uptake of more sustainable construction materials and practices.
- Planning our developments around a future less reliant on private motor vehicles and put viable options in place that support this transition.

Climate change

As we experience the impacts climate change is having on our homes, customers and communities, the need for this work has become more heightened and urgent. We are changing our systems, policies and processes so that Kāinga Ora is resilient and responsive to climate change while also using the opportunity to support New Zealand by testing and highlighting what can be achieved in this space.

Closing reflection

At Kāinga Ora, we recognise that with our scale and mandate comes a responsibility to create meaningful change. This plan covers the many steps we can take, big and small, to address climate change and help lead the way in the emissions reduction efforts Aotearoa needs to make.

By doing this mahi now, we are helping to prevent climate change, improving the lives of our customers and demonstrating how emissions reductions can be delivered across Aotearoa.

Introduction from Kāinga Ora Director – Sustainability



Alex Baker

The climate challenge

Climate change is a very real issue, which will impact the lives of New Zealanders via both its physical effects; and, through the changes that it inflicts on our way of life. Globally we find ourselves in a challenging position. The science is clear that the way we live is causing significant change to our climate and damage to the ecosystems we rely upon. Many of the economic and social issues we are grappling with today will be exacerbated by climate change, making it harder for us to take meaningful or cohesive action.

Organisations like Kāinga Ora are critically important as New Zealand seeks to set itself up for success in a climate change affected future. Our mandate asks us to invest in the homes and infrastructure that will shape how people live their lives. This investment can support our customers through a just transition. It can also make it easier, healthier, more comfortable and even enjoyable for all New Zealanders to tackle climate change.

The opportunity for Kāinga Ora

As both New Zealand’s public housing landlord and the Government’s urban development agency, our role is a complex one. In developing our first Emissions Reduction Plan, we have needed to consider the long-term impacts of today’s investment and development decisions alongside the wellbeing of our customers.

Kāinga Ora provides a home to some of the most economically and socially vulnerable New Zealanders. As a country we will find a way to adapt. However, the way we do so could either entrench the challenges that Kāinga Ora customers currently face; or paint a brighter future for them.

The largest cohorts of our customers are children and Māori. This is interesting to think about when it comes to considering what our role should be in relation to climate change. Many of our customers haven’t benefited from the system which has led to climate change. They also have limited means to protect themselves from its consequences.

Kāinga Ora has the opportunity to make deliberate decisions about where and how we build, how we support connection and accessibility, and how we build social and environmental resilience. Done right, these decisions will support our customers through the economic and social upheaval of climate change in a way that promotes equity and dignity.

The plan highlights the importance of investing even more in lifting the energy and design standards of our new homes and accelerating the uptake of more sustainable construction materials and practices. It also demonstrates the importance of making land use decisions that build communities in places where people can be less reliant on vehicles. In addition, actions as simple as giving people access to e-bikes can make a big difference.

Closing reflection

We have used this Emissions Reduction Plan to outline key opportunities and achievable steps that Kāinga Ora has taken or could take to substantially reduce emissions. Some of these actions we cannot begin as they require additional funding to our organisation. The purpose of this plan is to provide better information around what’s possible and how New Zealand could invest in urban development solutions that are consistent with meeting our climate change commitments.



This is the first Emissions Reduction Plan for Kāinga Ora.

It outlines our strategy to minimise the emissions footprint of our operations so we can contribute to Aotearoa New Zealand’s commitment to combatting climate change. We recognise the urgency of reducing greenhouse gas emissions, enhancing the wellbeing of New Zealanders and fostering resilient communities.

How we assess the effectiveness of actions taken by Kāinga Ora

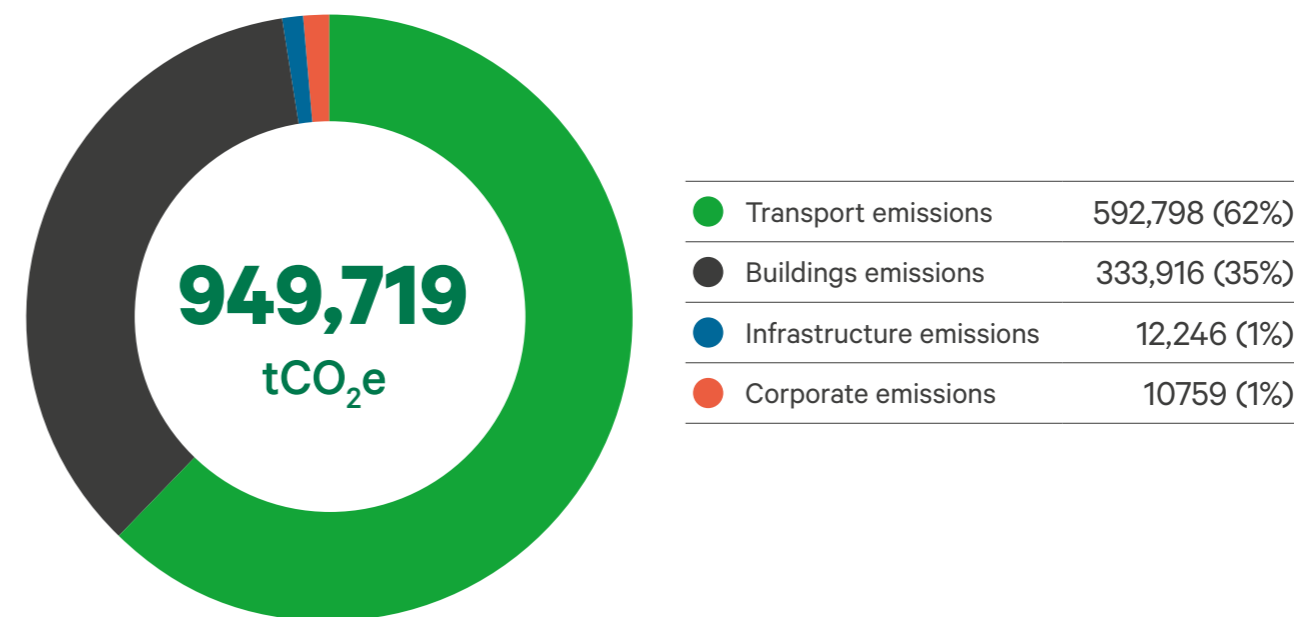
In this plan Kāinga Ora has looked at the total emissions reduction opportunities that result from activities we undertake. This includes emissions sources we directly control, and those we have reduced control over but have a strong ability to influence.

The New Zealand Government’s Aotearoa Emissions Reduction Plan sets industry-specific emissions reduction targets, to be achieved by FY35 compared to 2019 industry settings.

To be consistent with the approach taken by Government we have adopted FY35 as the year in which we assess the impact of any activities we undertake.

On this basis we estimate the total emissions associated with Kāinga Ora activities in FY35 would be 949,719 tCO₂e if no reduction action was taken.

Figure 1 Total projected Kāinga Ora emissions in FY35



Action to date

Kāinga Ora has been committed to taking action to reduce our emissions since our first Environment Strategy was published in 2019. Since 2019 we have invested in or committed to programmes that deliver significant emissions reductions. Through existing and funded programmes we estimate that:

- Intensification of housing through our Large-Scale Projects and our public housing programme will reduce our customers’ transport emissions. This would reduce total emissions by 16% in FY35 compared to the baseline if we had not delivered these programmes.
- Our programme to retrofit and renew existing public housing will reduce total emissions by 7% by FY35 compared to the baseline.
- Electrifying our fleet of corporate vehicles will reduce our corporate emissions by 17% every year – resulting in a 0.2% total reduction by 2035 compared to the baseline.

This Emissions Reduction Plan

There is a gap between what Kāinga Ora is planning to do now and what would be required to align with an emissions pathway that limits global average temperature increase to 1.5 degrees Celsius (°C) above pre-industrial levels (1.5 degree aligned targets).

This plan outlines the actions we can take to achieve these targets. Actions with the most impact would include:

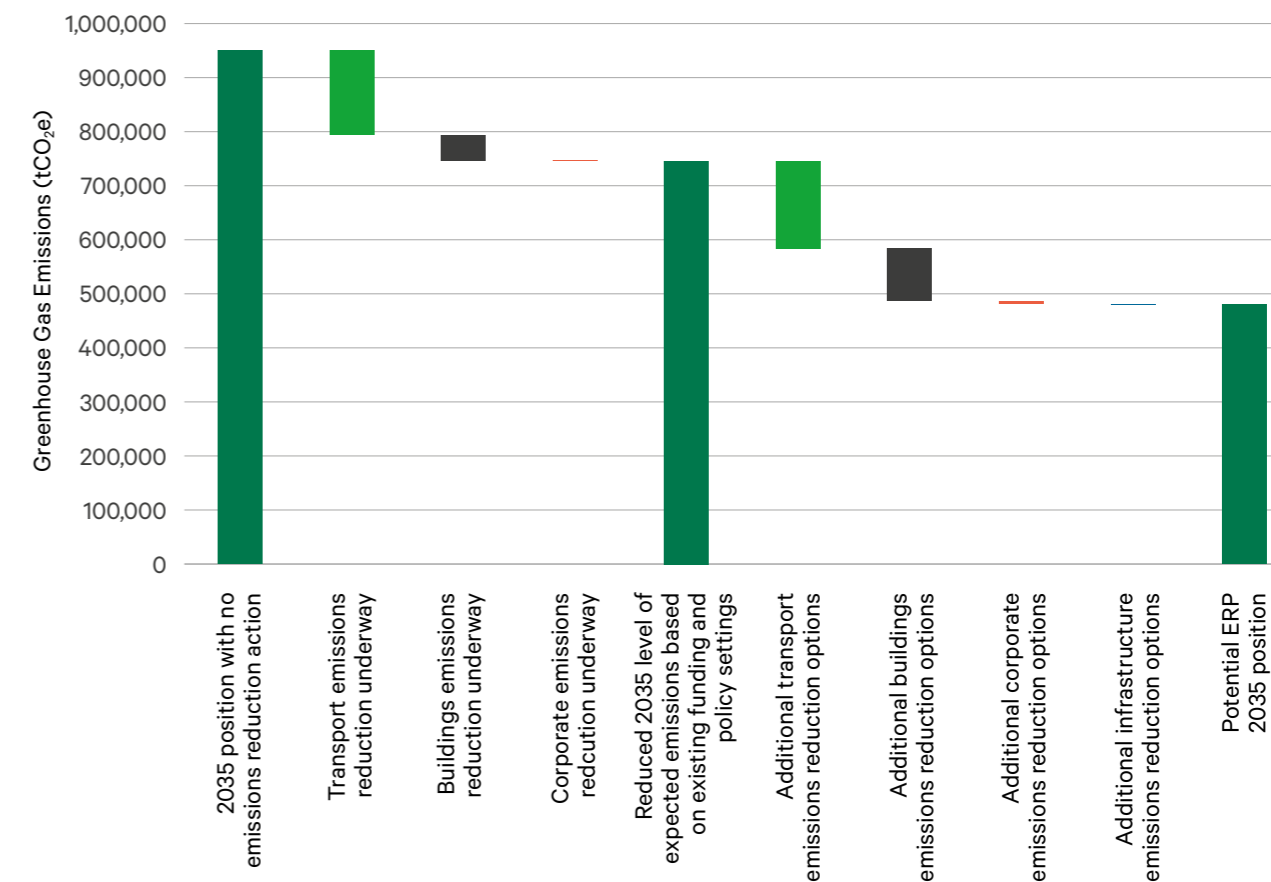
- Tightening our land development criteria to ensure that we only invest in areas that minimise customer transport emissions could achieve an 8% total emissions reduction in FY35.
- Delivering a programme that supports our public housing customers to increase their use of bikes could achieve a 7% reduction in our total emissions by FY35.
- Replacing hot water systems with hot water heat pumps could achieve a 3% reduction in our total emissions by FY35.

In addition we are required to adopt a 42% corporate emissions reduction target under the Carbon Neutral Government Programme. This results in a 0.4% reduction in total emissions by FY35.

Combined with the actions we are already funded to deliver, we expect that fully implementing the reduction pathways of this plan would result in a 52% emissions reduction compared to if Kāinga Ora took no action.

We expect that each of these actions will also deliver significant improvements for our customers and communities through better access to amenity, shorter travel distances, more active lifestyles, and energy cost savings.

Figure 2 Summary of FY35 potential emissions reduction opportunities outlined in this plan



Funding and operating settings

Our commitment to sustainability means that we are currently delivering our maximum emissions reduction potential under current financing and legislative settings.

Therefore, most of the pathways described in this plan will require a change to our policy or operating settings.





There are also broader trade-offs that may need to be considered, such as how delivering on the pathways may interact with our ability to deliver our other statutory functions and objectives.

Timing

The projected emissions reductions assume that interventions begin to be implemented within one year of publication. This will require us to prioritise feasibility work that enables us to seek endorsement and funding to implement the changes. Delays to this will limit the emissions reductions potential presented in this plan.

Kāinga Ora Emissions Reduction Plan Summary

The table below summarises the key components of each emissions category

	 Corporate	 Buildings	 Transport	 Infrastructure
Base year (FY23)	8,500 tCO ₂ e	298,006 tCO ₂ e	263,394 tCO ₂ e	18,089 tCO ₂ e
Baseline (FY23 – FY30)	68,000 tCO ₂ e	4,547,399 tCO ₂ e	4,641,095 tCO ₂ e	138,524 tCO ₂ e
Within our current funding and operational settings, we expect to...	Reduce corporate emissions by 27% by FY25 and 42% by FY30 compared to CNGP baseline for FY23	Reduce buildings emissions by 14% by FY35 compared to 2019	Reduce transport emissions by 26% by FY35 compared to 2019	Reduce infrastructure emissions by 0% by FY30 compared to FY23
To have 1.5°C aligned targets we would need to...		Reduce buildings emissions by 41% by FY35 compared to 2019	Reduce transport emissions by 41% by FY35 compared to 2019	Reduce infrastructure emissions by 42% by FY30 compared to FY23
Reduction strategies to achieve this include	<ul style="list-style-type: none"> Reduce business travel Downsize our fleet Electrify our fleet Have a sustainable taxi policy 	<ul style="list-style-type: none"> Improve our design and build standards Install hot water heat pumps Install mechanical ventilation with heat recovery Explore low-carbon structural materials 	<ul style="list-style-type: none"> Concentrate and intensify housing in the right locations Support access to bikes and e-bikes Reduce barriers to electric vehicles for our public housing customers 	<ul style="list-style-type: none"> Roll out successful pilots across our portfolio Concentrate and intensify housing in the right locations Adopt low-carbon materials Research and trial new low-carbon materials and technologies



Improving energy efficiency in dwellings by installing hot water heat pumps and mechanical ventilation with heat recovery.


Exploring the use of low carbon structural materials in buildings.

Investing in areas that minimise customer transport emissions.

Minimise business travel and promote low carbon commutes

Coordinating infrastructure delivery with other asset owners and adopting low carbon materials.

Supporting our public housing customers to increase their use of bikes and e-bikes.

 1. Introduction

Climate change is one of the greatest challenges we face.

The world needs to rapidly reduce greenhouse gas (GHG) emissions to avoid even more severe impacts. Kāinga Ora can contribute to the reduction efforts.

As New Zealand’s public housing provider and Crown urban development agency, Kāinga Ora has the opportunity to lead New Zealand’s built environment sector in emissions reduction activity. We can drive emissions reduction in the construction and operation of our buildings. We can also reduce emissions within the infrastructure and transport sectors – predominantly through our planning and

urban development activity. We have an opportunity to influence these sectors due to the scale of our development pipeline, through delivering proof-of-concept projects, and making sure the urban environments we create enable others to reduce their emissions. We also have a responsibility to reduce our corporate emissions.



1. Introduction

1.1 Context

Under section 107 of the Crown Entities Act 2004, Kāinga Ora has been instructed to comply with the Carbon Neutral Government Programme (CNGP). This requires Kāinga Ora to publish a public Emissions Reduction Plan. This plan must set gross emissions reduction targets that can be achieved by Kāinga Ora based on the reduction potential within the organisation, and that align with a global emissions pathway that limits global average temperature increase to 1.5 degrees Celsius (°C) above pre-industrial levels.

The Aotearoa New Zealand Emissions Reduction Plan¹ sets the direction for climate action across a range of sectors over the next 15 years. It outlines how New Zealand will play its part in global efforts to limit global average temperature increase to 1.5°C above pre-industrial levels. In this plan, we use it to provide a basis for setting 1.5 degree aligned targets.

The plan also aligns with the latest Kāinga Ora Environment Strategy, which was released in 2022.²







Our Emissions Reduction Plan sets out:

- **Baseline emissions pathways:** Emissions that would result if we continue our current course of action
- **Emissions reduction targets:** Our achievable and aspirational goals for emissions reductions
- **Reduction pathways:** Opportunities to deliver additional emissions reductions. Some pathways require additional funding or regulatory changes to occur.

We will assess and report on performance against our targets annually, through the CNGP reporting portal. The plan will be updated periodically when there are changes in our direction or new opportunities arise.

1.2 Emissions sources

We have categorised our emissions into four groups. Each is covered by a section in this plan:

Emissions group ³	Description	CNGP requirements
1 Corporate emissions 	Emissions from our corporate and employee-related activities.	Kāinga Ora must: <ul style="list-style-type: none"> • Measure emissions • Set a target • Report emissions • Offset (from 2025) all emissions sources in the corporate emissions group.
2 Buildings emissions 	Emissions from energy and water consumption in Kāinga Ora homes (operational emissions), as well as materials used in their construction and maintenance (embodied emissions).	Kāinga Ora must: <ul style="list-style-type: none"> • Measure emissions • Set a target • Report emissions.
3 Transport emissions 	Emissions from the day-to-day travel of people living on land developed by Kāinga Ora from their home to the places they visit to live their lives.	Kāinga Ora is not required to set a target, report or offset emissions in this group. However, transport emissions associated with the movement of people living in our homes make up 45% of all emissions Kāinga Ora has some control or influence over, so we have opted to report and set a target for the transport emissions group.
4 Infrastructure emissions 	Emissions from the energy and materials used to construct infrastructure we develop (embodied emissions).	Kāinga Ora must: <ul style="list-style-type: none"> • Measure emissions • Set a target • Report emissions.

1. <https://environment.govt.nz/publications/aotearoa-new-zealands-first-emissions-reduction-plan/>

2. <https://kaingaora.govt.nz/assets/Publications/Strategic-documents/Environment-Strategy.pdf>

3. One of the main ways that greenhouse gas emissions are measured and assessed is to look at them within three different ‘scopes’. Essentially, scope 1 emissions are those direct emissions that are owned or controlled by a company, whereas scope 2 and 3 indirect emissions are a consequence of the activities of the company but occur from sources not owned or controlled by it.

Kāinga Ora corporate emissions consist of Scope 1 (Direct), Scope 2 (Purchased Electricity) and Scope 3 (Indirect) emissions (GHG Protocol).

Buildings, transport and infrastructure emissions are almost entirely Scope 3 (Indirect). Energy used in the communal areas in our buildings is Scope 2 because Kāinga Ora manages and pays for it.

1.3 Base year and baseline

Baseline emissions provide a reference point for measuring the success of our emissions reduction activity.

For the purposes of CNGP reporting we have elected to use:

- the period from 1 July 2022 to 30 June 2023 (FY23) as our base year for all emissions sources. This captures the impact of our existing activities and the emissions reduction benefits of actions we already have underway. It enables us to identify our emissions hotspots over the last year.
- the period from 1 July 2022 to 30 June 2030 as our baseline for all emissions sources. This enables us to understand how our emissions profile may change over time.

However, when thinking about our overall contribution to limiting climate change to 1.5 degrees, our baseline varies across our emissions categories. More information on this can be found in each of the sections. In summary:

- Corporate: Uses FY23 – FY30 as the baseline, to align with CNGP requirements
- Buildings and Transport: Uses 2019 industry settings as the baseline and sets emissions reduction targets for 2035 to align with the Aotearoa Emissions Reduction Plan
- Infrastructure: Uses FY23 – FY30 as the baseline to align with the approach taken by some of our key infrastructure partners.

1.4 Targets

Emissions reduction targets help us to understand what we need to do to ensure we are on track to meet government expectations to contribute to limiting climate change to 1.5 degrees:

- The CNGP sets a mandatory target for our **corporate** emissions. We have adopted the mandatory target for this emissions category.
- For our **transport** and **buildings** sections we have elected to adopt the national targets detailed in the Aotearoa Emissions Reduction Plan for 2035. These set 1.5 degree aligned emissions reduction targets of 41% reduction by FY35 compared to 2019.
- For **infrastructure** there is no national target, so we have opted to align with Auckland infrastructure asset owners’ targets of 42% emissions reductions by FY30 compared to FY23.

The CNGP also requires us to report on our gross emissions reduction that can be achieved based on our reduction potential. We have interpreted this to be what emissions reductions we expect are achievable within our current funding and operational settings for FY25 and FY30. We report the gap between where this gets us and where our targets need to be to align with limiting climate change to 1.5 degrees.

1.5 Reduction strategies

Our reduction strategies outline opportunities for Kāinga Ora to deliver additional emissions reductions.

These are framed as what more we would need to do to meet our 1.5 degree aligned targets, compared to what we expect to achieve under our current funding and operational settings.

Several of the proposed reduction strategies already have established or planned work programmes to implement them. Others require further research or funding before detailed implementation planning can be conducted.

Within its current funding and financing settings Kāinga Ora does not expect to be able to achieve the balance of the emissions reductions required while also delivering against other Government expectations and its core activities.

So, most of these pathways will require additional funding or regulatory changes to occur. This document is not intended to be a detailed implementation plan.

Further details on what reduction strategies are underway or require further work are provided in the sections below.

We estimate what the potential emissions reductions benefits of these interventions would be by FY30 for corporate and infrastructure emissions, and FY35 for buildings and transport.

1.6 Methodology

For each emissions group we have estimated baseline emissions. The baseline emissions estimates include some industry level changes that are outside of Kāinga Ora control (i.e. increased electrification of cars and increased renewable energy in New Zealand’s electricity network). We have then estimated how emissions profiles may change depending on the emissions reduction interventions we undertake (emissions reduction pathways). These pathways differentiate between what emissions reductions we can achieve within our current funding and operational settings, and what further interventions would be needed to achieve an emissions reduction aligned with limiting climate change to 1.5 degrees.

Our emissions estimates are produced by using Excel or PowerBI driven quantitative modelling. These models quantify emissions by taking the expected volume of an activity and multiplying it by an emissions factor (see Figure 3). Modelling methods and assumptions vary depending on the emissions group and the reduction strategy in question. Further detail on modelling methodologies and assumptions for specific emissions groups and pathways is set out in each section, and full details are provided in the appendix (see assumptions section).

Figure 3 Emissions Quantification Methodology



1.7 Broader outcomes

While the primary purpose of this plan is to present how we can contribute to emissions reductions, most of our interventions have been designed to deliver co-benefits. Often these co-benefits are higher again than the emissions reduction alone.

Benefits include:

- Improvements to people’s health and wellbeing
- Improvements in people’s connection to Te Taiao
- Cost savings for our customers
- Cost savings for the government
- The value of knowledge generated for the construction, planning and transport sectors as Kāinga Ora pilots different ways of doing things.

1.8 Equitable transition and Māori considerations

We provide homes for some of the most economically and socially disadvantaged people in Aotearoa New Zealand. Many of our customers live with a range of vulnerabilities or disabilities that make it difficult or impossible for them to secure housing in the private market.

We need to ensure that our contribution to a lower-emissions economy is done in a way that is just, fair and inclusive for all our customers and communities.

This means we can’t introduce undue burdens on the people living in our homes as we go about our emissions reduction efforts.

Our approach to developing this plan has focused on prioritising interventions that deliver broader wellbeing benefits for customers, and do not place an unfair burden on them in the transition towards a low-emissions economy.

Kāinga Ora also has obligations under the Kāinga Ora–Homes and Communities Act 2019 to Māori, which include ensuring we have the capability and capacity to uphold the Treaty of Waitangi when carrying out our urban development functions. Our operating principles, with which we have to comply when performing our functions, include identifying and protecting Māori interests in land while recognising and providing for the relationship of Māori with their ancestral lands, water, sites, wāhi tapu, and other taonga.

This will be particularly important when we think about how we prioritise locations for development from a transport emissions perspective. When considering how we uphold these obligations we will also need to look at how we balance our desire to reduce travel and drive corporate emissions reductions with the need to partner with Māori, which often requires kanohi ki te kanohi engagement.

Kāinga Ora works with a wide range of Iwi and Māori organisations and in 2022, 35.5% of Kāinga Ora tenants identified Māori as at least one of their ethnicities. Māori are an important customer cohort and Partner group to our organisation.

In developing this plan we sought to respond to the feedback we heard from Māori in relation to their aspirations for the environment, and the role Kāinga Ora can play. Some of the key things we considered are:

- The relationship between the environment and overall wellbeing.
- The need to deliver actions that also respond to broader financial, cultural and environmental considerations (such as water quality, ability to grow kai) for Māori.



- Anxiety, for many, about their ability to combat significant climate-related disasters.
- The desire for self-sufficiency and being able to combat climate change through actions they take and on their whenua.
- Specific actions going forward include ensuring that we still facilitate in-person collaboration with Māori, despite our plan to reduce overall business travel, and making sure we prioritise improving access to e-vehicles for Māori communities who need to travel to their marae and whānau centres.

1.9 Engagement

Many of the reduction strategies in this plan require us and our partners to do things differently. It is important that we consider a wide range of perspectives when planning such changes.

We have engaged widely across Government and the sectors in which we operate, including with our construction and maintenance partners, throughout the development of this plan.

Our strategies aim to empower our partners and the industry to improve how we do things, but we need to bring everyone on the journey to ensure they are supported through this period of change.

We will continue to engage with these organisations and groups as we move into implementation of our initiatives.

 2. Corporate Emissions

Our corporate emissions for FY23 base year are a total of 8,500 tCO₂e.

Kāinga Ora has already undertaken activities that reduce corporate emissions by 21%.

To meet the Carbon Neutral Government Programme requirements, Kāinga Ora has set an absolute target to reduce our corporate emissions by 42% by FY30.

Addressing these emissions is important for us to achieve compliance, and to ensure we get things right in our internal operations. However, we need to consider our overall impact in relation to our other emission sources.



Our reduction strategies include:

- Electrifying our fleet
- Downsizing our fleet
- Reducing business travel
- Reducing emissions from staff commuting.

2. Corporate Emissions



2.1 Introduction

Kāinga Ora employs more than 3,000 people and has almost 50 offices across Aotearoa New Zealand – the two main sites being in Tāmaki Makaurau Auckland and Te Whanganui-a-Tara Wellington. Our offices include main corporate offices, local area offices and customer contact centres.

Our corporate emissions come from direct and indirect activities associated with operating our organisation, such as:

- Business travel
- Fleet vehicles
- Staff commuting
- Office energy
- Waste to landfill

2.2 Control and influence

As a government organisation, Kāinga Ora has the responsibility to lead by example in our approach to reducing corporate emissions. While the emissions associated with our corporate activities make up just 1% of the total emissions Kāinga Ora controls or influences, they are a key focus under the CNGP and addressing them is essential to ensure we are ‘walking the talk’.

Like most organisations, Kāinga Ora has considerable control over most of the decisions that influence corporate emissions as many of them are associated with controllable costs. We have the greatest ability to reduce emissions associated with our organisational policies and operations. Specifically, business travel and our fleet are two areas where we can have the greatest impact. This is because we have the authority to change our approach and the proposed changes result in no, or very little, additional cost.

On the other hand, Kāinga Ora has limited control over emissions associated with staff commuting, as these are often determined by individual travel behaviour. However, we have the opportunity to work with our staff and explore various options to support them to make sustainable travel choices.

Baseline Corporate Emissions



FY23

8,500 tCO₂e

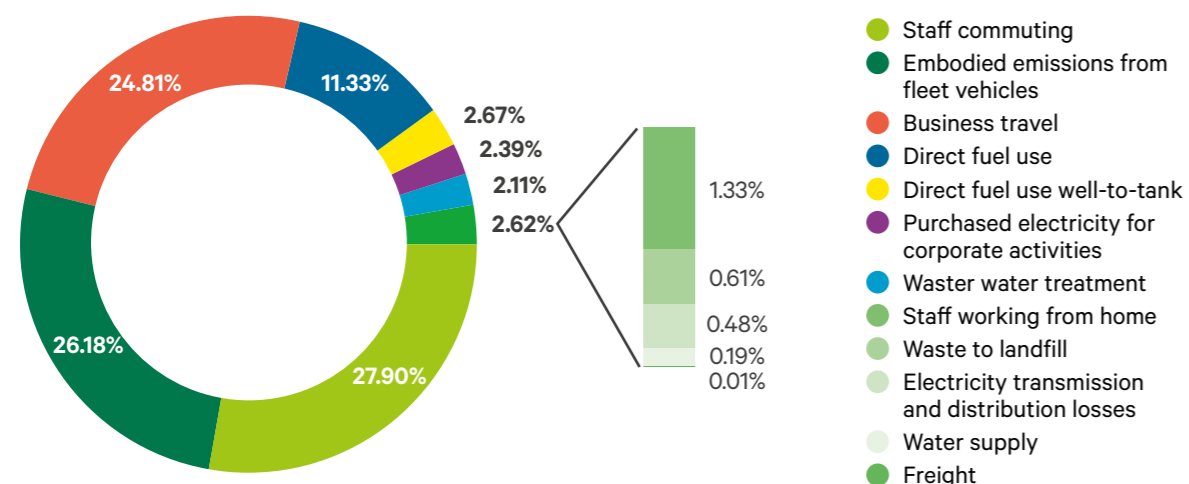
2.65 tCO₂e per FTE

FY23 – FY30

68,000 tCO₂e

~8,500 tCO₂e per annum

Figure 4 Base year (FY23) corporate emissions by source



2.3 Baseline corporate emissions

Our corporate emissions for the FY23 base year are a total of 8,500 tCO₂e. Key sources of corporate emissions are staff commuting, embodied emissions from our fleet vehicles, business travel (made up of flights, hotels and taxis), and direct fuel use in our fleet vehicles (Figure 4).

Our corporate emissions baseline (FY23 – FY30) is forecast to be 68,000 tCO₂e. This equates to around 1% of our total emissions. Over this period the key sources of emissions are the same as for the base year.

These emissions include reductions from activities we are already undertaking, primarily the electrification of our fleet vehicles. This has resulted in an emissions reduction of 11% compared to if we hadn't done the electrification.

As of 30 June 2023, our 948-vehicle fleet consists of 64% hybrids, 34% electric vehicles and 2% hybrid electric vehicles. We no longer own any fully petrol vehicles. By Q1 2026, we anticipate our fleet will be fully electric.

We have also undertaken other actions that have an emissions impact. These include:

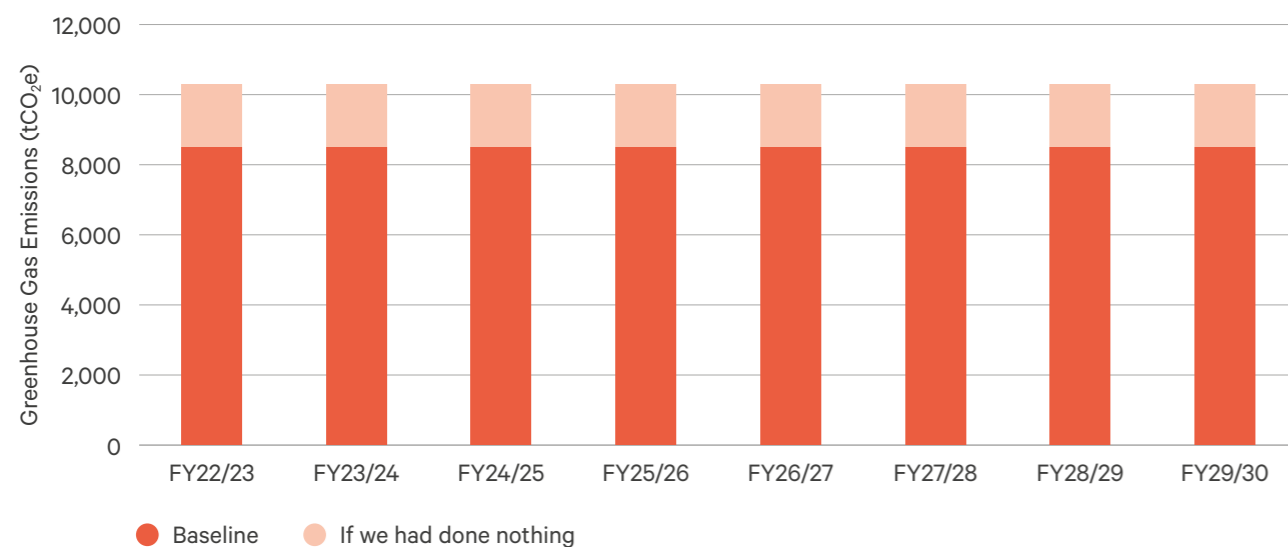
- Implementing a flexible working policy: Since December 2021 we have provided flexible working arrangements for staff. A recent employee survey shows that 35% of days (1.75 days per week) are worked from home. This has reduced total corporate emissions by 10%.
- Achieving sustainability certifications: The Kāinga Ora Newmarket office has achieved a 5 Star NABERS rating, demonstrating operational energy efficiency, and a 5 Star Green Star rating, which is classified as New Zealand excellence for the buildings performance and emissions impact. We are also working towards a NABERS rating for our main office in Wellington and our office in Manukau, Tāmaki Makaurau Auckland. The impact of this has not been quantified.



As of 30 June 2023, our 948-vehicle fleet consists of:

64%
hybrids,
34%
electric
vehicles,
2%
hybrid
electric
vehicles.

Figure 5 Impact of our current approach on the Kāinga Ora corporate emissions baseline



2.4 Targets

Under the CNGP we are required to set an absolute target for our corporate emissions reduction that is consistent with limiting climate change to 1.5 degrees.

Our target, relative to the FY23 base year, is a reduction of 27% by FY25 and 42% by FY30. This will be used for reporting under CNGP requirements.

This target is based on a reduction from our FY23 base year and so excludes the emissions

reductions from interventions that are underway, such as our fleet electrification programme.

The Carbon Neutral Government Programme requires us to offset remaining emissions, after gross reductions are made, to achieve carbon neutrality from 2025. Even if we were to achieve our targets, this is estimated to be ~26,400 tCO₂e resulting in ~\$3.6m in offset costs between FY25 and FY30.



2.5 Reduction strategies

Our reduction strategy for corporate emissions focuses on what we need to do to achieve this 42% reduction target. Since 65% of our corporate emissions come from business travel and our fleet vehicles, we can focus our efforts on these key sources and achieve emissions reductions with the smallest number of business changes.

While internal policies and strategies may need to change, making reductions in these areas also results in cost savings or cost neutrality.

This means we won't need any additional funding to deliver our proposed pathway. However, from December 2025 we will have to pay offsets for any emissions we can't cut (even beyond our target) (see 2.4).

EV charging stations installed

**In 46
offices**

**In 119
employee
homes**



Reduction pathway

This pathway includes:

- Completing our fleet electrification programme, which reduces corporate emissions by a further 11%. This programme replaces any of our petrol or diesel passenger vehicles due for renewal with an electric vehicle, or a plug-in hybrid vehicle if an electric vehicle is not suitable.
- Reducing the size of our fleet by 21% by FY30, which would reduce the associated vehicle embodied emissions and reduce our overall emissions by 12%.
- **Reducing emissions from staff commuting by 10%. This could be achieved through:**
 - Encouraging staff to work from home two days per week to deliver a 4% emissions reduction.
 - Encouraging and enabling the use of active and public transport, and carpooling to achieve a further 6% emissions reduction. We can improve our messaging and incentives for low-emissions forms of transport. In areas with fewer public transport options we can facilitate car sharing. We can also reconsider office locations as leases come up for renewal.
 - Reducing business travel (flights, hotels and taxis). After implementing the approaches above, we will need to reduce business travel by 41% to achieve our overall emissions reduction target.

The make-up of this reduction pathway may change depending on operational requirements. For example, if we find that reducing our fleet size impacts our ability to serve our customers, we will need to reduce further in other areas such as business travel or staff commuting.

Figure 6 Impact of corporate emissions reduction interventions on the Kāinga Ora corporate emissions base year (FY23)

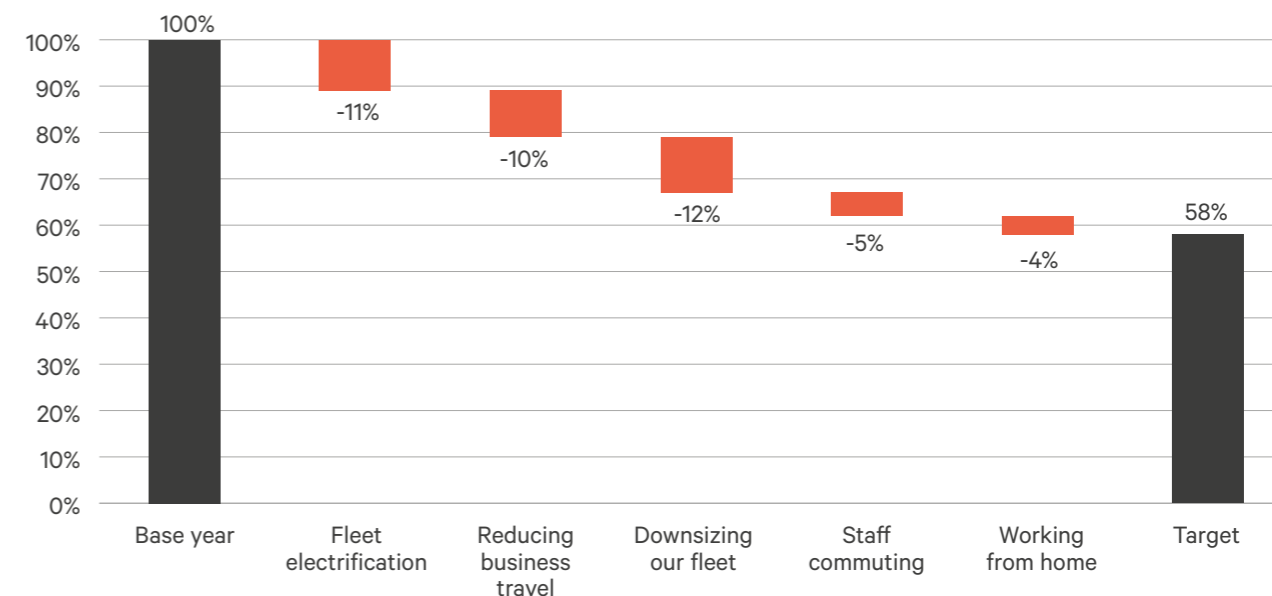
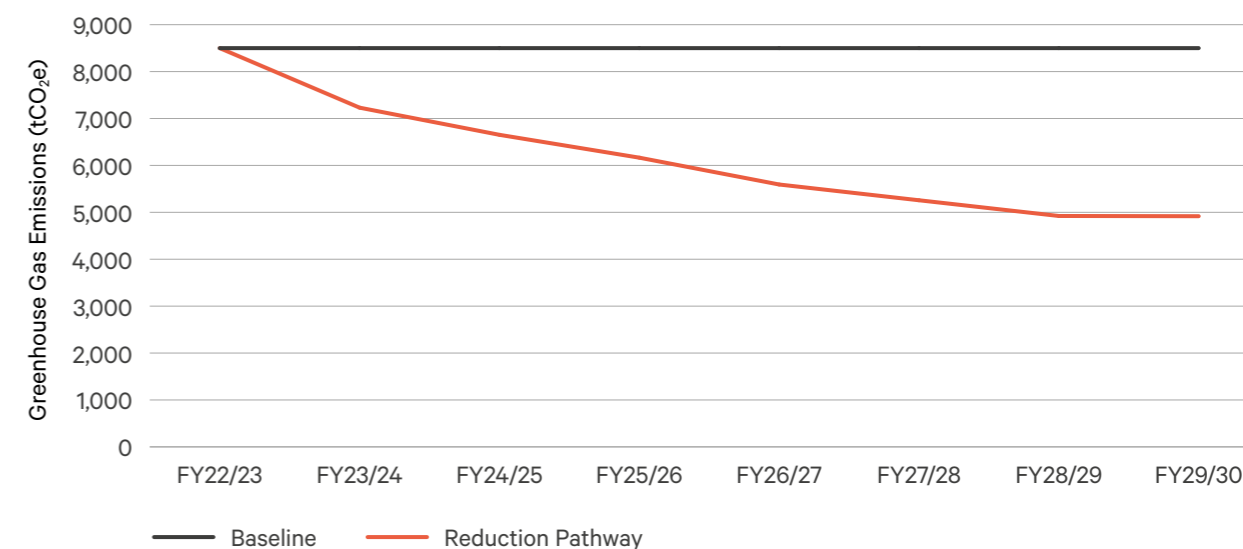


Figure 7 Kāinga Ora corporate emissions reduction pathway





2.6 Equitable transition and Māori considerations

Reducing our corporate emissions will require some changes to our organisational policies and processes. Kanohi te kanohi engagement and meeting at certain locations can be more important for some groups.

We will involve Māori, Pasifika, and other minority groups in decision making throughout so we can understand how the changes may impact them.

It is crucial that relationships and the way we partner with Māori are not affected by any changes to these policies and processes.

2.7 Co-benefits

Some of the proposed interventions will provide co-benefits to Kāinga Ora, including delivering savings (through reducing the total number of flights taken by employees). We also recognise the important role that an organisation with a large fleet can play in bringing electric vehicles into Aotearoa New Zealand and, eventually, into the second-hand car market. Our investment in electric vehicles will also help to improve the affordability of second-hand electric vehicles for New Zealanders.

2.8 Key assumptions and exclusions

We selected FY23 as our base year as the previous two financial years were affected by Covid-19.


The data used for our corporate emissions base year is collated from several sources. Some of the key sources are travel-booking reports, fuel reports and individual office power bills from our providers. Calculations for wastewater treatment are based on average employees in the financial year.

Our staff commuting and working from home emissions were calculated through an organisation-wide survey and the external tool CarbonWise.

The embodied emissions for our purchased vehicle fleet were calculated on a \$ spend emissions factor for any vehicles purchased within the financial year.

The following exclusions have been made in our base year and baseline calculations:

- Non-mandatory emissions sources that contribute less than 1% of our total corporate emissions.
- Emissions from our cloud-based data centres as they contribute less than 1% of our total corporate emissions and are therefore not material.
- Two of our offices have generators that run for a very limited time per year. We have considered them as not material.
- Purchased goods and services such as staff devices and office equipment, because of their relative insignificance and the challenges of accurately measuring these emissions.

 3. Building Emissions

Our building emissions for the FY23 base year are a total of 298,006 tCO₂e.

This is equivalent to 1.61 tCO₂e per building occupant. Our buildings emissions baseline (FY23 – FY35) is a total of 4.24m tCO₂e (~530,399 tCO₂e per annum).

To set a target consistent with limiting climate change to 1.5 degrees we need to reduce buildings emissions by 41% by FY35 compared to emissions under 2019 industry settings.

We already have programmes underway which we estimate reduce emissions by 14%, such as the retrofit and renewal of existing homes, replacing inefficient traditional lightbulbs with LED lighting and installing low-flow water fittings in our new and existing homes.

Our future retrofit and renewal programme is included in reduction pathway 1 because it is unfunded beyond FY26. This pathway also includes delivering and upgrading our energy efficiency standard for new homes. We expect this will deliver an additional emissions reduction of 9% by FY35 compared to our FY23 baseline.

Therefore, we need to deliver an additional 18% emissions reduction by FY35 to achieve the 41% reduction target.



Kāinga Ora does not expect to be able to achieve the balance of the emissions reductions required within its current funding and financing settings. Reduction strategies 2 and 3 outline what is required to achieve this and include:

- Installing hot water heat pumps in our new and existing homes.
- Specifying the use of low-emissions concrete instead of standard concrete in our mid-to-high rise building construction.
- Exploring construction with structural materials with lower embodied carbon.

3. Building Emissions

3.1 Introduction

As of 30 June 2023, Kāinga Ora has 72,035 homes in our portfolio and we plan to build 31,429 new homes by 30 June 2030. We also plan to retrofit approximately 1,000 homes per year.

The construction and ongoing running of these homes produce emissions. We have used Whole Building Lifecycle Carbon Assessment⁴ methodology, which categorises emissions into two main types:

- **Embodied emissions** are the greenhouse gas emissions associated with new construction, retrofitting and maintenance of homes. This includes manufacturing processes of building materials and products, transport of products and workers to and from site and the machinery and site activities associated with the construction of homes.
- **Operational emissions** are the greenhouse gas emissions associated with the energy and water our customers use to maintain healthy and comfortable living conditions within their homes.

3.2 Control and influence

Our scale of buildings investment means we have the responsibility to ensure we deliver low-emissions homes that do not lock New Zealand into high emissions outcomes for years to come. This scale, as well as the pace at which we work, positions us well to lead the sector in innovation, research, and capacity building.

We have the greatest ability to reduce emissions during design by considering what materials and systems are specified in our buildings. The scale of our investment means we can support the use of sustainable solutions and accelerate emissions reductions within the sector.

On the other hand, we have limited control over how our buildings are used, for example, how long our customers run their heaters. However, we do have the opportunity to influence this by improving the performance of our buildings and building warm, dry, healthy homes.



Baseline Building Emissions



FY23

298,006 tCO₂e

1.61 tCO₂e per occupant total

57 whole-of-life tCO₂e per occupant for new construction

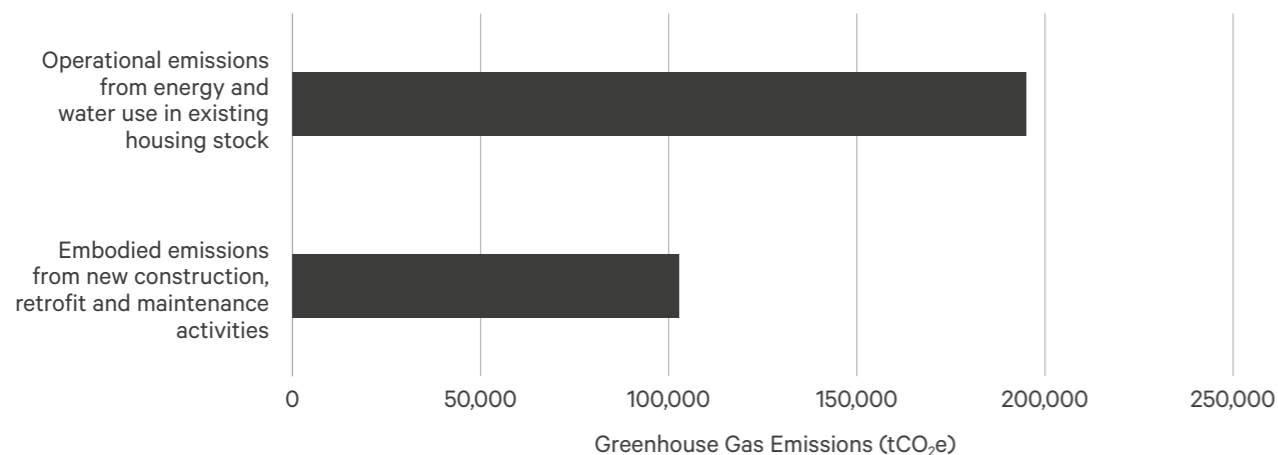
2023 – 2035

4.24m tCO₂e

~530,399 tCO₂e per year

4. Whole Building Lifecycle Carbon Assessment (WBLCA) is well established internationally through various ISO Standards, European Union Standard, country-specific building codes and best practice standards. Our WBLCA is aligned with the principles set out by the Ministry of Business, Innovation and Employment (MBIE) Building for Climate Change Programme, Building Research Association of New Zealand (BRANZ) research, and the New Zealand Green Building Council's Homestar Version 5 Standard and Framework.

Figure 8 Base Year Embodied vs Operational Buildings year (FY23) embodied and operational building emissions



3.3 Baseline building emissions

Our buildings emissions for the FY23 base year are a total of 298,006 tCO₂e. Our buildings emissions baseline (FY23 – FY30) is a total of 4,243,188 tCO₂e (~530,399 tCO₂e per year).

66% of our buildings emissions are operational emissions, compared to only 34% that are embodied emissions (Figure 8). This split is similar between our base year and baseline. However, most embodied emissions are released in the construction phase, whereas operational emissions occur over the following 50 years. Therefore, it is important to consider both.

Our FY23 emissions exclude reductions from activities we are already undertaking. They result in an emissions reduction of 3% by FY35 compared to 2019 industry settings (Aotearoa Emissions Reduction Plan). These activities include:

- Upgrading all our public and supported housing to meet Healthy Homes Standards. These upgrades include improving heating, insulation and ventilation, which increases the energy efficiency of the home. As at 30 June 2023, 97% of the Kāinga Ora portfolio either complies with the Healthy Homes Standards or has work in progress to meet them.⁵
- Retrofits completed to date as part of our retrofit programme.
- Replacing inefficient traditional lightbulbs with LED lighting and installing low-flow water fittings in our new and existing homes, resulting in a 1% emissions reduction.

5. While this may result in some emissions reduction, the impact has not been measured because it is hard to determine how our customers' energy-use behaviour has changed as a result of the improvements.

3.4 Targets

To set an emissions reduction target that aligns with limiting climate change to 1.5 degrees requires us to reduce buildings emissions by 41% by FY35 compared to emissions under 2019 industry settings.

This has been informed by the Aotearoa Emissions Reduction Plan. This will require us to achieve an absolute emissions reduction of our current public and supported housing, as well as a reduction in the emissions intensity of our new construction.

Current activities we are undertaking result in a 14% emissions reduction by FY35 compared to 2019 industry settings. If the debt facilities are approved to enable us to continue the renewal and retrofit programmes and adopt the building improvement standards set out in reduction pathway 1 (below), then we expect an additional reduction in buildings emissions of 9% by FY35, against 2019 industry settings.⁶

Therefore, we need to deliver an additional 18% emissions reduction by FY35 if we are to achieve the 41% reduction target.

Under our current funding and operational settings, we do not expect to achieve this target. Reduction strategies 2 and 3 outline what more is required to achieve this.

3.5 Reduction strategies

We have identified three emissions reduction pathways. Our approach to developing these pathways considered several factors including the likely cost, feasibility, emissions reduction potential, and co-benefits associated with various interventions.

We have focused on measuring the emissions impact of reduction pathways 1 and 2. We plan to model the impact of reduction pathway 3 as further information becomes available (such as research on the impacts on our customers of removing carpet or reducing space dedicated to car parking) and emissions factor information improves.

6. The CNGP requires us to report on our gross emissions reduction that can be achieved based on our reduction potential for FY25 and FY30, against our FY23 baseline. We have interpreted this as what we expect is achievable within our current funding and operational settings. We have calculated this to be:

- Existing public and supported housing: absolute reduction of 0% by FY25 and 13% by FY30, compared to our FY23 baseline
- New construction: emissions intensity (per occupant) of 1% by FY25 and 2% by FY30, compared to our FY23 baseline.

These figures will be used for reporting under Carbon Neutral Government Programme requirements.

Reduction pathway 1

This pathway describes the future actions that Kāinga Ora is taking to deliver emissions reductions – they can all be absorbed within our current operating budget and fall within our control. These actions will:

- Deliver an emissions reduction 9% by FY35 compared to 2019 industry settings for all existing public and supported housing
- Reduce the emissions intensity of our new construction by 1% by FY25 and 2% by FY35.

These actions focus on helping the broader industry work towards meeting these emissions budgets:

- **Continue our retrofit and renewal programme:** To improve the quality and efficiency of public and supported housing. 13,000 homes will be renewed or retrofitted between now and FY30.
- **Transition to 6 Homestar v5:** All new homes designed from 1 January 2024 will be built to the 6 Homestar v5 building standard, which requires buildings to meet certain energy efficiency criteria. We will achieve these requirements by increasing insulation levels (roof, walls, floors, windows and doors) and installing continuous mechanical ventilation in our new homes. Delivering to this new standard will result in an 8% decrease in operational energy usage and emissions compared to compliance with the 5th Edition of the H1 clause of the New Zealand Building Code.
- **Install solar panels:** By the end of 2024, our Kāinga Ora solar panel programme will install solar panels on around 780 Kāinga Ora homes. Kāinga Ora is unlikely to expand this programme further without further funding, so this programme is not expected to continue.

- **Track emissions to influence decisions:** In FY24, we will implement a lifecycle carbon assessment tool⁷ to inform how we design and deliver 6 Homestar v5 homes. It provides our industry architects with information on what solutions can reduce emissions on individual projects. Data generated from architects using the tool can be aggregated to accurately measure our performance against emissions reduction targets.
- **Leverage procurement:** Working with our material and product suppliers to ensure they can provide Environmental Product Declarations (EPDs); and expanding this into supply agreements and requirements for construction products. EPDs provide more accurate emissions information for measuring and reporting, as well as influencing suppliers to reduce emissions associated with their products.



Many decisions that can influence emissions reductions are made in the planning phase.

Reduction pathway 2

This proposed pathway aims to further reduce operational emissions in our new and existing public and supported housing. It achieves a further 11% emissions reduction. Kāinga Ora could implement this pathway from 1 January 2025 onwards if it is funded.

These actions will:

- Deliver an additional emissions reduction of 9% from reduction pathway 1 by FY35 for all existing public and supported housing
- Reduce the emissions intensity of our new construction by an additional 17% by FY35, resulting in an additional total building emissions reduction of 2%.

This reduction pathway includes the following interventions:

- All interventions in reduction pathway 1
- **Install hot water heat pumps:** Using hot water heat pumps rather than electric resistance hot water cylinders could achieve an average of 21% annual reduction in total energy use per home. We can specify the use of hot water heat pumps in our public and supported housing through our new construction programme and retrofit programme.⁸ Centralised systems exist and are already being used in the private development sector for higher-density buildings. We expect the effective implementation of this intervention from FY24 could reduce emissions by 13%.



Installing hot water heat pumps and mechanical ventilation with heat recovery can reduce total home energy use by 28%.

- **Install mechanical ventilation with heat recovery:** Installing mechanical ventilation with heat recovery in our new homes can lead to a further 7% reduction in total home energy use compared to continuous mechanical ventilation with no heat recovery. This intervention could reduce emissions by 2% and achieve significant health improvements through moisture reduction.
- **Use low-emissions concrete:** We can specify the use of low-emissions concrete instead of standard concrete in our mid-to-high rise building construction. This reduces emissions by 3%. Low-emissions concrete is already readily available in the market and the concrete and cement industry is working to provide further decarbonisation solutions.

7. The tool we are using is Cerclos' RapidLCA.

8. In our reduction pathway, we have assumed that we will install hot water heat pumps in 25% of existing public and supported housing each year between 2025 and 2029.

Reduction pathway 3

This pathway includes interventions that have great impact but may be harder to deliver because of funding constraints and because they are a departure from ‘normal’ practice. Delivering these interventions would therefore also support a change in practice across the industry.

These actions will:

- Deliver no additional emissions reductions compared to reduction pathway 2 for all existing public and supported housing
- Reduce the emissions intensity of our new construction by an additional 29% by FY35.

Reduction pathway 3 includes the following interventions:

- All interventions in reduction pathways 1 and 2



Using alternative structural materials for high-density homes may reduce our embodied emissions.

- **Use low-emissions structural materials:** A large proportion of our embodied emissions come from the structural materials we use in high-density homes – mainly concrete and steel. There are other options available that may reduce emissions but further work is needed to determine the best option, the emissions reduction potential and how this could be rolled out at scale.
- **Reduce carpet use:** After structural materials, carpet is the next biggest source of embodied emissions. Further work is needed to investigate how we can reduce the use of carpet in our newly constructed homes. Acoustic impacts will need to be considered; however, reduced use of carpets is likely to also save costs to the Kāinga Ora construction and maintenance programmes.
- **Reduce emissions in infrastructure on the site:** This includes storm, waste and potable water infrastructure, as well as site works and foundations.
- **Target a higher building standard:** We could improve building performance and further reduce emissions by targeting higher than the 6 Homestar v5 standard.
- **Use land more efficiently:** We can optimise how we use land available to us by reducing space dedicated to driveways and car parking. This reduces the volume of concrete used in building driveways and car parking, and frees up space to build more homes.

Figure 9 Absolute emissions reduction pathway for existing public and supported housing⁹. Note that reduction pathway 3 has no impact on emissions from existing homes.

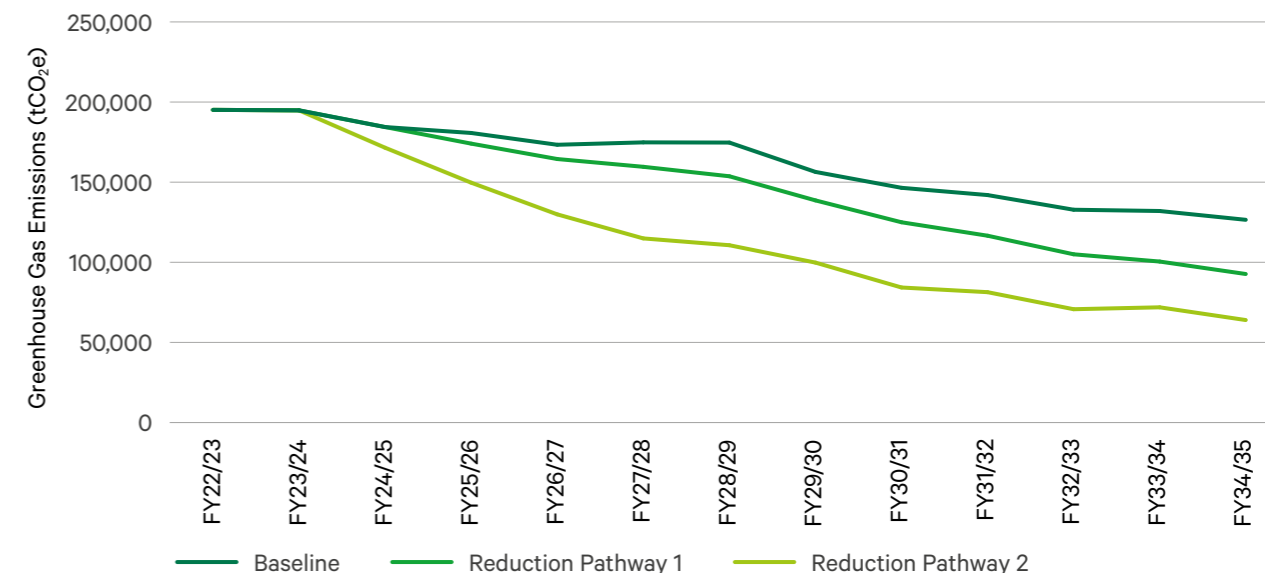
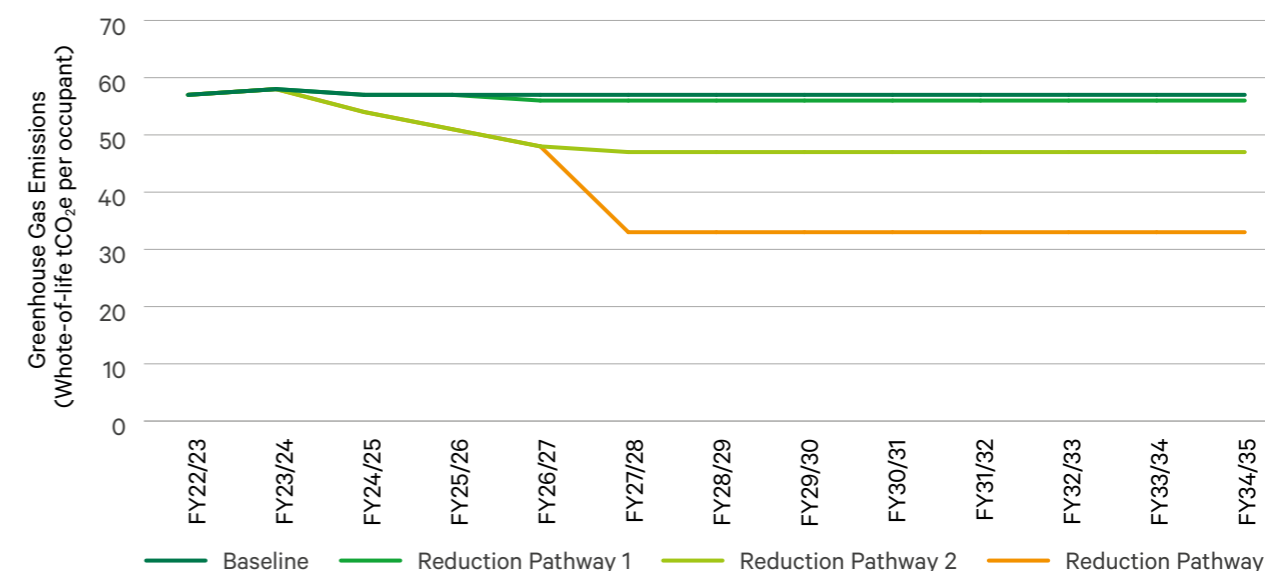


Figure 10 Emissions intensity reduction pathways for new construction



9. The baseline includes an assumption for the decarbonisation of the energy grid.

3.6 Equitable transition and Māori considerations

Given that a significant proportion of our customers are Māori, we have ensured proposed interventions are focused on improving Māori outcomes. Our proposed emissions reduction strategies within the buildings sector will benefit Māori with:

- **Improved health and wellbeing:** Enhanced building performance and improved ventilation can contribute to healthy indoor air quality and thermal comfort. This can help reduce mould growth and respiratory diseases, such as asthma, which disproportionately affect Māori communities.
- **Energy efficiency and affordability:** Improving building performance and specifying energy-efficient services such as hot water heat pumps, mechanical ventilation with heat recovery and solar panels can lower energy consumption and electricity bills for households, and help alleviate financial burdens. Māori and Pasifika households are overrepresented in energy hardship statistics.
- **Economic opportunities and job creation:** Investing in building performance improvements can stimulate economic activity and create job opportunities for Māori. Kāinga Ora has successfully engaged organisations with

Māori connections to deliver training and upskilling initiatives related to construction, energy efficiency, and sustainable building practices (including those beyond emissions, such as circular economy, biodiversity and regenerative/generative design), which can provide pathways for employment and entrepreneurship within the community.

3.7 Co-benefits

Kāinga Ora plays a large role in the Aotearoa New Zealand construction industry. We can use the scale of our investment to help the wider sector increase its capacity and capability to reduce emissions and achieve better outcomes. This includes:

- Adopting proven solutions across our large construction programme to help suppliers deliver low-emissions products and services at scale
- Providing opportunities to upskill designers and builders to deliver high-quality, low-emissions buildings
- Sharing insights and case studies with the industry¹⁰
- Improving wider health and wellbeing outcomes to reduce the burden on our health system.

10. We are already working on these by:

- Supporting our industry architects to be trained as Homestar v5 designers and assessors
- Early adopting cross-laminated timber and timber mid-rise buildings
- Providing case studies such as the Bader Ventura Certified Passive House (Passivhaus) showcased by the MBIE Construction Sector Accord Beacon Project Case Study.

3.8 Key assumptions and exclusions

Our base year does not include:

- Emissions from market housing developments delivered by private developers on land sold to them by Kāinga Ora.
- Emissions from homes purchased by Kāinga Ora from the market that were constructed before 1 January 2022. It is assumed that market homes delivered after this date and purchased by Kāinga Ora have had no prior use. Therefore, the embodied emissions are attributable to us.
- End-of-life embodied emissions associated with buildings disposed of during the period (C1–C4 and D). These have been assessed as immaterial.
- Emissions from civil infrastructure constructed within the building lot (e.g. gardens, pathways, car parks, foundation). We are currently unable to capture this information reliably, but it will be reported in future periods if it is found to be significant.
- Biogenic removals.

Our baseline adheres to the same methodology as our base year, with identical inclusions and exclusions except for end-of-life embodied emissions associated with buildings disposed of during the period (C1–C4 and D) which are included.

All buildings data is modelled. This means that rather than collecting information about actual material and energy use, we have developed reference building models to represent expected usage.

All reference building embodied emissions (A1-A5, B2, B4, C1-C4 and D) have been modelled in-house using the Building Research Association of New Zealand (BRANZ) LCAQuick 3.4.4 tool.

All reference building operational emissions (B6 and B7) have been modelled in-house using a combination of ECCHO, DesignBuilder and the Passive House Planning Package (PHPP). The BRANZ grid electricity emissions factor (an average of 0.15kgCO₂e/kWh to 2030 and 0.09 kgCO₂e/kWh over 50 years) has then been applied to determine operational emissions from electrical energy use. Our modelling assumes homes are heated to 20°C 24/7. This assumption is consistent with the Homestar v5 standard and Ministry of Business, Innovation and Employment’s Building for Climate Change Programme Operational Efficiency Methodology. We acknowledge that actual heating patterns vary, but using a standard calculation method enables the consistent calculation of operational emissions without the variation associated with occupant behaviour.

BRANZ water and wastewater emissions factors have been applied to determine water emissions.

Modelled reference building emissions are applied to our projected build pipeline out to 2030. The future pipeline is inherently uncertain as it may be subject to changes in Kāinga Ora priorities or funding settings, as well as other impacts.

We also present a whole-of-life intensity baseline for our new construction based on the number of occupants housed, rather than based on typical gross floor area. This measures all emissions associated with the entire life of a building (construction, maintenance/use and end-of-life) in the year the building is completed. We have assumed a 50-year useful life for buildings to align with the Ministry of Business, Innovation and Employment’s Building for Climate Change Embodied Carbon Methodology. Occupancy is determined based on Kāinga Ora Design Guidelines.

It is assumed that our houses, duplexes and terraces take one year from consenting to build. Walk-ups are assumed to take two years and apartments three years.

 4. Transport emissions

Our customers' transport emissions for the FY23 base year are a total of 263,394 tCO₂e.

Our transport baseline emissions out to FY35 are 4.64m tCO₂e (~580,137 tCO₂e per annum).

To set a target consistent with limiting climate change to 1.5 degrees we need to reduce transport emissions by 41% by FY35, compared to emissions under 2019 industry settings.

Our Large-Scale Projects and the activities we currently undertake to support intensification activities in areas that minimise transport

emissions already go a long way in helping us to reduce transport-related emissions. We estimate these will result in a 26% emissions reduction by FY35, against 2019 industry standards.

Therefore, we need to deliver an additional 15% emissions reduction by FY35 to achieve the 41% reduction target.



Kāinga Ora does not expect to be able to achieve the balance of the emissions reductions required within its current funding and financing settings. Reductions strategies 1, 2 and 3 outline what is required to achieve this and include:

- Further concentrate and intensify housing development in areas that minimise transport emissions
- Support access to bikes and e-bikes for people living in these homes
- Reduce barriers to e-vehicles for those public housing customers who need access to cars

4.1 Introduction

For Kāinga Ora, the bulk of the transport emissions we influence relate to the distance and frequency of car trips made by our customers, and the future residents of the homes we enable, to meet their daily and weekly needs. This includes public housing customers and people who buy or live in housing enabled through our land development programmes.

The transport emissions of our customers, and future residents of our homes, are typically shaped by:

- Where our customers' homes are located in relation to their whānau and friends, places of worship, jobs, schools, supermarkets, doctors etc. This relates, in part, to the homes that are available when customers are shortlisted from the housing register.
- The quality, availability and affordability of the public transport, walking and cycling infrastructure and services that connect them to these places.
- Existing travel behaviours, both those which can't be changed (e.g. due to disability or sickness) and those where mode-shift could occur if barriers were removed.¹¹

Compared to the general population, we expect Kāinga Ora customers have relatively low transport emissions. On average lower socio-economic groups make 17% fewer car trips and travel 21% shorter distances than the average New Zealander.¹² The findings of our Kāinga Ora Easy to Access Sustainable Transport (EAST) research revealed that in some instances this could be because our customers are forgoing goods and services they need, such as visiting a doctor, due to the prohibitive cost of transport. Improving access to low-emissions transport modes, and improving the proximity of goods and services can help reduce transport poverty. Therefore, while this section focuses on reducing transport emissions, it is also driven by a need to improve the ease and affordability with which our customers can access the places they want to get to.

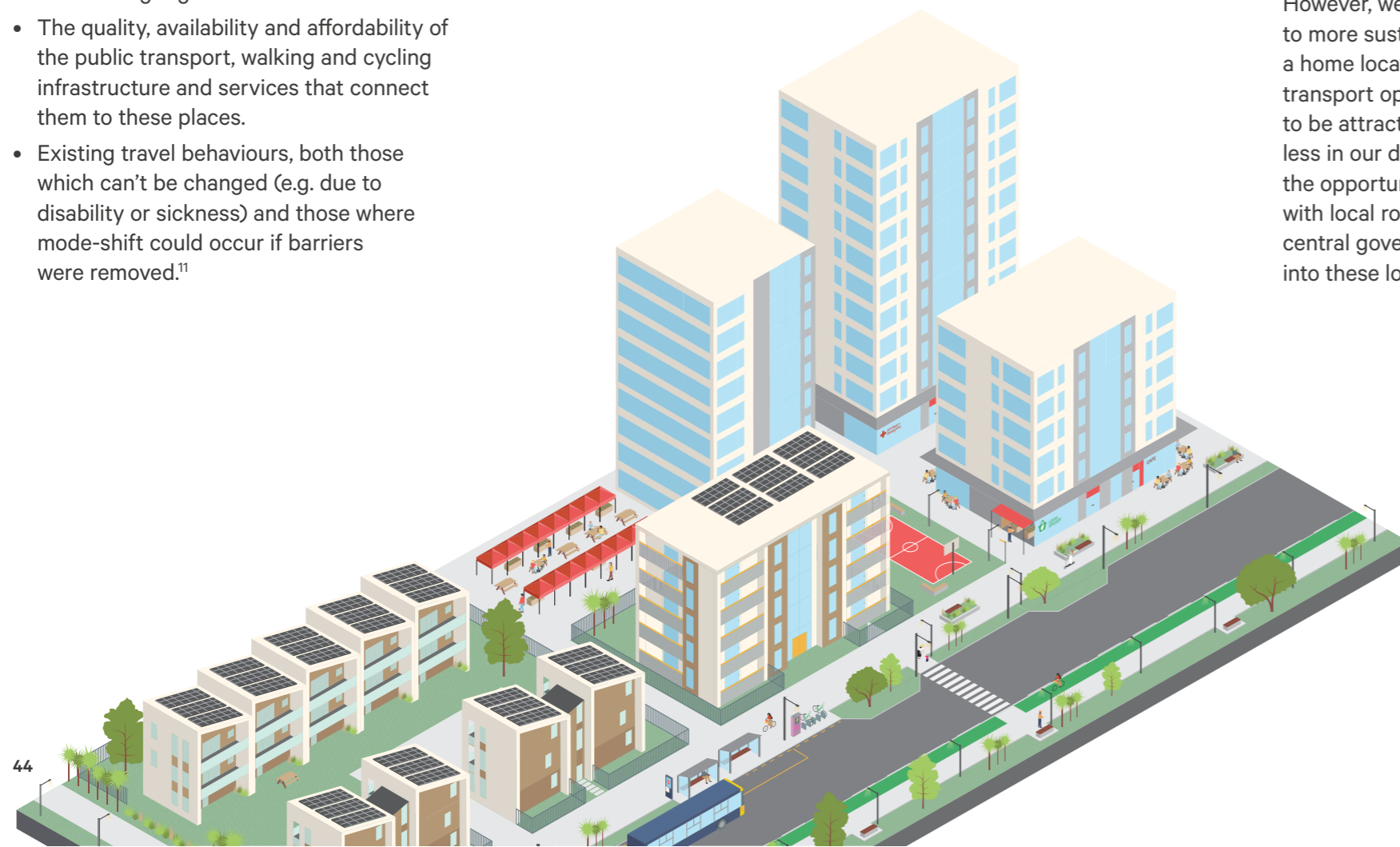
4.2 Control and influence

The scale and pace of our urban development work means that we have an unprecedented opportunity to partner and co-ordinate activity across government agencies.

We have the opportunity to resolve historical patterns of car-dependent development, and deliver low-emissions walkable, neighbourhoods.

The transport system as a whole is complex, and is shaped by the actions of many participants. While we will need to partner, we also need to identify where we can have the greatest impact. Our core function as a housing developer means our greatest ability to influence emissions arises from the way we use our land and where we choose to develop.

However, we know that for people to transition to more sustainable modes, they not only need a home located near amenity with sustainable transport options, but also need these modes to be attractive, safe and affordable. This is less in our direct control. However, we have the opportunity to influence this by partnering with local road controlling agencies and central government to concentrate investment into these locations.



Baseline Transport Emissions



FY23

263,394 tCO₂e

1.42 tCO₂e per occupant

FY23 – FY35

4.64m tCO₂e

~580,137 tCO₂e per annum

11. Kāinga Ora research shows that key barriers to our customers getting around on sustainable modes include: cost, needing to go to multiple places on a journey, having too much to carry, and having to take children or other people.

12. 'Socioeconomic inequalities in greenhouse gas emissions from household travel in Aotearoa/New Zealand', Caroline Shaw, Ryan Gage, Mel McLeod, Rhys Jones, Anja Mizdrak, Alistair Woodward (unpublished).



4.3 Baseline transport emissions

Our transport emissions for the FY23 base year are a total of 263,394 tCO₂e.

Our transport emissions baseline (FY23 – FY35) are a total of 4,641,095 tCO₂e (~580,137 tCO₂e per annum).

These emissions projections exclude reductions from activities that we are already undertaking. They result in an emissions reduction of 26% by FY35, compared to 2019 industry settings (Aotearoa Emissions Reduction Plan). These activities include:

- **Delivering and enabling increased density in areas that minimise transport emissions through our Large-Scale Projects (LSPs).**

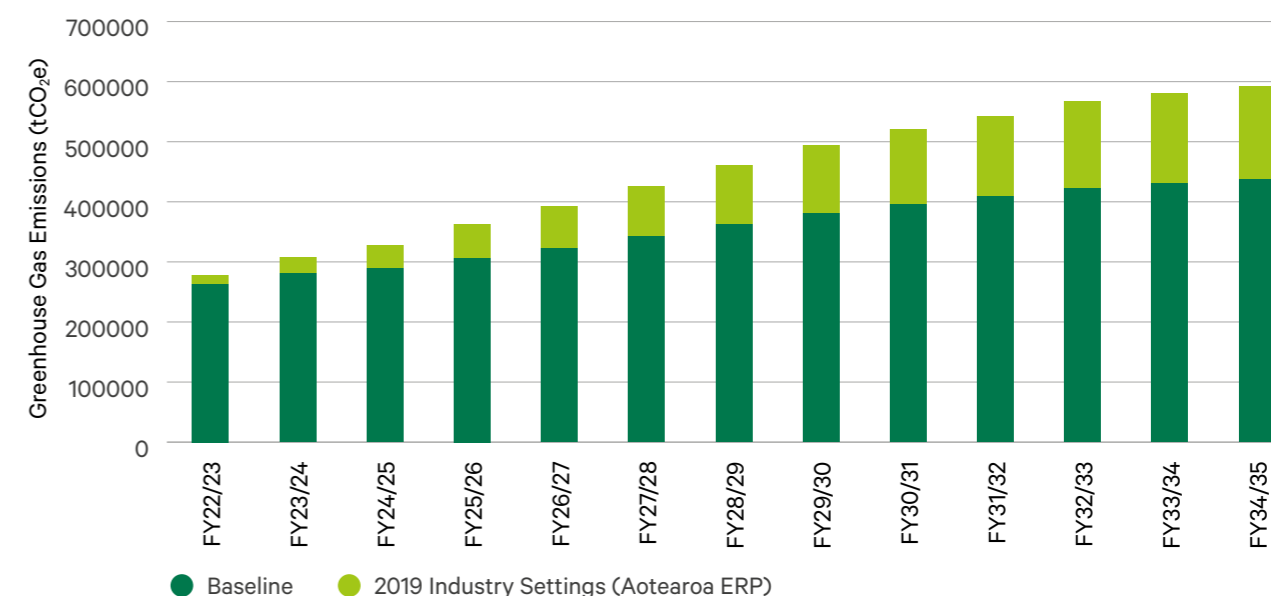
The locations of our homes determine how far people need to travel to meet their daily needs and can influence how many trips people have to take by car compared to more sustainable options.

Not enabling this development in LSPs would result in new housing with higher transport emissions profiles being built on the outskirts

of these cities, or in areas further away from existing amenity and sustainable transport networks. This will result in longer trips, higher vehicle kilometres travelled and higher emissions by 70% compared to a home built within an LSP. This programme has resulted in a 17% reduction in the total transport emissions associated with Kāinga Ora compared to if we were to enable the same number of homes in areas that do not support occupants to reduce their transport emissions.

- **Intensification of our existing land holdings in areas that minimise transport emissions.** This means the proportion of homes enabled in areas that force customers to depend on private vehicles will decrease, while a higher proportion of homes we enable will be in areas that minimise transport emissions. Delivering an average of a 1 to 4 uplift in these areas enables a 9% reduction in the total transport emissions compared to delivering the balance of housing in high vehicle kilometres travelled areas.

Figure 11 Impact of our current approach on the Kāinga Ora transport emissions baseline¹³



We also undertake a range of other interventions which drive emissions reductions. These are harder to quantify, but include:

- Delivering increased housing in targeted areas through the Kāinga Ora Land Programme. This provides an opportunity for us to deliver further housing in areas that minimise transport emissions.
- Accelerating changes to planning regulations and funding, influencing strategies, policies and guidance (e.g. Future Development Strategies); and delivering infrastructure and amenity to support increased density. These actions support our customers and make it easier and cheaper for the private sector to deliver intensified development in these areas. Given the lack of control Kāinga Ora has over the eventual development outcomes we have not estimated the emissions reduction impact of these.

- Kāinga Ora is a partner in the Urban Growth Partnerships that cover all the Tier 1 urban areas and Queenstown, where we undertake joint spatial planning and programme development activities with local authorities, Crown agencies and Māori. These partnerships all aim to reduce transport emissions through locating all urban activities of scale on major public transport network, enabling mode shift, and completing a vehicle kilometres travelled reduction programme.
- Within our Large-Scale Project areas we are investing in infrastructure to improve walking, cycling and public transport access. This makes it more attractive, easier and safer for people to travel by these modes through our neighbourhoods, and helps them to connect to wider transport networks.

13. The 2019 Industry Settings (Aotearoa Emissions Reduction Plan) baseline includes an assumption for the uptake of EVs.

- Vesting our land to road controlling authorities to provide new public pedestrian and cycling linkages through our developments. This helps overcome historical car-centric planning decisions, breaking up super blocks so people can travel shorter distances to key amenities.
- Facilitating provision of public transport service improvements and further walking and cycling infrastructure via engagement with road controlling authorities.
- Prioritising placement of customers in areas that are close to their existing communities, whānau/iwi, employment, education and leisure activities.

4.4 Targets

Setting an emissions reduction target that aligns with limiting climate change to 1.5 degrees requires us to reduce transport emissions by 41% by FY35 compared to emissions under 2019 industry settings.

Within our current funding and operational settings we expect to be able to achieve a reduction in transport emissions intensity (per household) by FY35 of 26%, against 2019 industry settings.¹⁴

Therefore, we need to deliver an additional 15% emissions reduction by FY35 to achieve the 41% reduction target. **We will need further funding and changes to operational settings to achieve this.**

14. The CNGP requires us to report on our gross emissions reduction that can be achieved based on our reduction potential for FY25 and FY30, against our FY23 baseline. We have interpreted this to be what we expect is achievable within our current funding and operational settings. We have calculated this to be a reduction in emissions intensity (per household) of 0.44% by FY25, and 2.82% by FY30, compared to our FY23 baseline. These figures will be used for reporting under Carbon Neutral Government Programme requirements.

4.5 Reduction strategies

We identified additional opportunities for Kāinga Ora to support reductions in transport emissions. We have grouped these interventions into three different reduction pathways.

Our approach to developing these pathways considered various factors including the likely cost, feasibility, and emissions reduction potential of our interventions. For transport in particular, we considered the most impact and control Kāinga Ora could have on the sector.

Under our current funding and operational settings, we do not expect to be able to achieve any of these proposed pathways. If we were to continue to operate under existing funding and partnership arrangements, we would only achieve the emissions reductions captured in our baseline (Figure 11).



Investing in areas with good access to amenity, public and active transport options will reduce transport emissions.

Reduction pathway 1

This pathway focuses on using our role as an urban development agency to rapidly transform existing low density neighbourhoods in areas that are close to amenity, and make better use of land. This will ensure land use is aligned with other government transport investments (e.g. new rail, walking and cycling connections), and areas with good existing amenity.

We have estimated that if Kāinga Ora was to not acquire new sites or intensify sites we currently own that are in high vehicle kilometres travelled locations, we could reduce transport emissions of new housing by 13% by FY35.

The interventions in this pathway include:

- **Prioritise investment in areas that minimise transport emissions**
Kāinga Ora could establish a stronger policy on where we invest in, and deliver, new housing. Various strategic central government and Kāinga Ora documents (such as GPS HUD, Urban Development Act, Kāinga Ora Urban Development Strategy and Land Acquisition Plan) define what a well-located area for Kāinga Ora investment is. While these speak to transport emissions, they do not prescribe thresholds for induced car use or access to amenity. To help give sufficient weighting



Delivering more housing in well located areas will minimise transport emissions.

to transport emissions in decision making we could look to develop these thresholds.

This intervention would require additional funding to enable us to focus on acquiring land in these types of areas.

- **Optimise sites in areas that minimise transport emissions through delivering more housing**
To support the prioritisation of land development in areas that minimise transport emissions, we will need to ensure we optimise these sites through delivering more housing. This will ensure that more people can live in areas that support them to reduce their transport emissions. Increasing the number of houses on these sites can also support improvements in rapid and frequent public transport and make commercial activity viable in the area.

While we may intend to deliver intensification in these areas, we (and the market) are often constrained by the escalating construction costs of delivering apartment typologies. The issue with delivering lower-density development in this market is that we continue to lock in car-dependent urban design and forced car ownership for future generations.

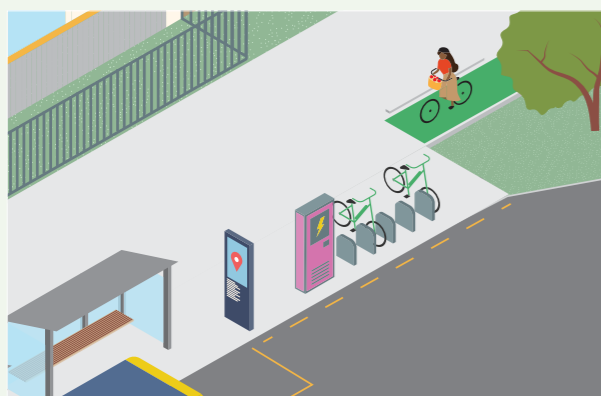
This action focuses on securing funding to meet the cost pressures of intensification.

Reduction pathway 2

This pathway focuses on our role as a landlord where we can control how our land is used, as well as our touch points with customers. It aims to increase the availability of e-bikes in the community and decrease customers' barriers to using them. This pathway will rely on partnership with local authorities, community groups, private organisations and other government agencies to support the financing and operation of this programme.

A dedicated programme to support bike uptake that doubles our customers' access to bikes and supports them to replace five car trips each week would result in a further 11% emissions reduction by FY35.

The following interventions are included:



Supporting access to bikes and e-bikes to reduce the number of car journeys.

- **Support access to bikes and e-bikes**

Studies and trials in various cities around the world, including in New Zealand, have identified that providing people with e-bikes allows them to replace an average of 20% of car journeys. This is independent of the availability of walking and cycling infrastructure. Alongside this, the Kāinga Ora EAST report identified that public housing customers were more likely than the general population to identify lack of access to a bike as a barrier to using this mode, and less likely to identify a lack of infrastructure or weather as barriers to uptake.

This indicates the potential success of a programme that improves access to bikes, particularly in development areas with good cycling infrastructure and where homes are close to amenities such as employment, schools, medical centres and shopping centres. We can facilitate partnerships between our tenants and government agencies or community groups who have programmes to support access to bikes and e-bikes. We can also offer the use of our land and developments to facilitate these programmes (such as allowing shared bikes to be stored). This may be cost-neutral but may require some changes to our operating functions to be able to deliver the scheme.

Reduction pathway 3

This pathway focuses on using our land and relationships with our customers to support shared vehicle leasing schemes. It will require partnership with other government agencies, or private companies, to fund and deliver this programme.

A dedicated programme to reduce barriers to electric vehicles for public housing customers could result in a further 3% emissions reduction by FY35.

This pathway includes the following intervention:

- **Support customers to access electric vehicles**

Electric vehicles are only part of the solution to emissions reductions. This is because a lot of emissions are required to manufacture them, they lack the efficiency and urban form improvement benefits of public transport, and don't offer the health and other benefits of walking and cycling. Other barriers include the costs of cars and the need for a valid driving licence.

However, in areas and for certain types of trips where public transport, walking and cycling options are limited, electric vehicles can have an impact in helping reduce our emissions.

We can play a similar role to that of the e-bikes (reduction pathway 2) in helping to reduce barriers our customers face accessing electric vehicles. This could include activities such as supporting car sharing. This may be cost-neutral, but may require changes to our operating functions in order to be able to deliver this scheme.



4.6 Equitable transition and Māori considerations

Our public housing customers find it much harder to get around than most other New Zealanders.

Our Kāinga Ora EAST report found that many customers were unable to access doctors, supermarkets or friends because they couldn't afford to get there.

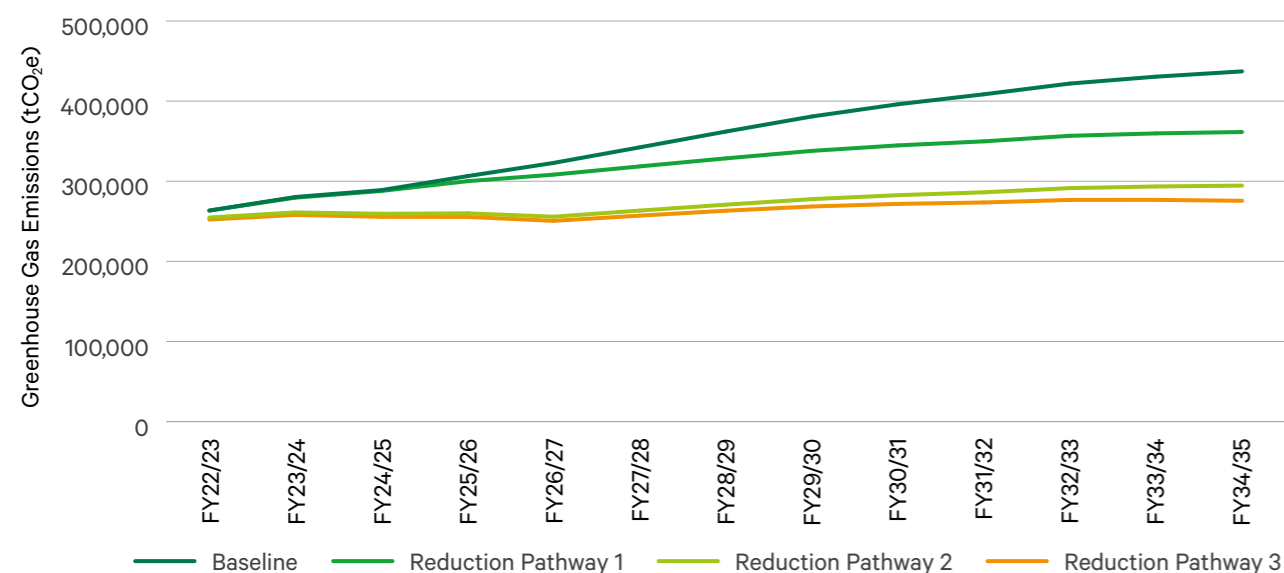
When planning how we can reduce our transport emissions, we need to think about how we can help our customers overcome access barriers, and not make it harder for them to get to the places they need and want to get to.

We also need to consider that some of our actions may have greater consequences for Māori than the general population, because Māori:

- Are vulnerable to the costs of meeting emissions reduction as they are overrepresented in the lowest-income households. They are likely to be affected if fuel prices increase and are less likely to be able to afford to transition to electric vehicles.
- Have complex travel patterns that are not always well served by public transport, walking and cycling.
- Are more likely to experience sickness and disability at a younger age, which can inhibit their ability to travel by walking, cycling and public transport.

It has also been raised as a concern that developing only in locations which minimise transport emissions could mean we develop less in areas that are important to Māori. We need to make sure we provide housing and optimise land use in areas that are also close to the places and people important to our Māori customers.

Figure 12 Kāinga Ora transport emissions reduction pathways



4.7 Co-benefits

Supporting a transition to low-emissions transport delivers a wide array of broader benefits. Improving the system for Kāinga Ora Customers will make the system better for everyone. These include:

- **Cost savings:** Low-emissions modes of transport are cheaper than owning and maintaining a private vehicle. This is particularly relevant in the context of increasing fuel prices associated with emissions pricing, along with rising insurance costs.
- **Improved health:** Increases in physical activity via walking, cycling and public transport use can reduce the risks of obesity, cardiovascular diseases and other chronic health conditions.
- **Improved liveability:** Reducing the proportion of trips people take by cars can contribute to quieter, safer and more vibrant neighbourhoods where it is enjoyable to spend time, and where children are safe to travel independently.
- **Increased climate resilience:** Providing more transport options helps improve people's resilience to the consequences of extreme weather events that can cause road closures, traffic and disruptions in fuel supply.
- **Better land use:** Providing car parking to service our developments is an expensive and inefficient use of residential land; and can limit the total number of homes we can build. An effective transition away from cars is likely to reduce the number of car parks we need to provide, and enable us to use this land for more housing. This would improve the cost effectiveness of housing investment programmes.

4.8 Key assumptions and exclusions

We based our transport emissions modelling on average trip distances and mode of New Zealanders. This primarily drew on the Household Travel Survey.

This was then adjusted for regional differences (drawing on the Auckland Transport Macro Strategic Model (MSM) and differences in public housing customers' travel behaviour, compared to the general population (utilising the University of Otago Study).

Our base year of transport emissions includes the emissions from the travel of customers in our existing public and supported housing.

Our baseline emissions out to FY35 include the projected emissions of Kāinga Ora customers living in existing public housing, Kāinga Ora customers living in new public housing forecast to be completed during this period, and residents of market and affordable housing that Kāinga Ora will enable during this period.

Our baseline emissions assumes an underlying EV uptake rate for market and affordable housing customers which is consistent with the MoT forecast EV uptake rate (which assumes hybrids, plug in hybrids and electric vehicles make up 44% of light vehicle kilometres travelled by 2040). For public housing customers we have assumed a base EV uptake rate at 50% of the speed of the general public.

Transport emissions are also associated with how our staff travel – these are covered in the corporate section of the plan. Emissions associated with the construction of transport infrastructure are included in the infrastructure section.

 5. Infrastructure Emissions

Our infrastructure emissions for the FY23 base year are a total of 18,089 tCO₂e.

Our infrastructure emissions baseline (FY23 – FY30) is a total of 138,524 tCO₂e (~17,316 per annum).

To align with targets set by our main infrastructure partners we need to reduce infrastructure emissions by 42% by FY30, compared to our FY23 base year.

Under our current funding and operational settings we expect to only achieve a small reduction in infrastructure emissions by FY30. We have trials in place and infrastructure projects through which we are attempting to improve efficiency of delivering infrastructure. However, we are usually bound to the service levels and standards set by asset owning

organisations, so we have limited ability to achieve reductions at scale.

We have also not yet investigated the degree to which our intensification programmes result in emissions reductions through supporting the efficient use of infrastructure, so this is not included in our assessment.

Therefore, we will need to deliver an additional 42% emissions reduction by FY30 to achieve the target. Under our current funding and operational settings, we do not expect to achieve this target.



Our key reduction strategies include:

- Delivering trials to better understand what our most impactful and feasible solutions are, and then expanding these trials
- Intensifying in areas that support the efficient use of infrastructure & adopting low emissions materials accepted by asset owners
- Trialling new low emissions materials & technologies

5. Infrastructure Emissions

5.1 Introduction

Kāinga Ora has an infrastructure investment pipeline of more than \$2 billion over the next 10+ years. We are also one of the only agencies who invest in assets of all types (water, transport, housing, etc). This gives us significant potential to influence the construction and infrastructure sector.

The activities contributing to infrastructure emissions are those associated with the Kāinga Ora land development and infrastructure programmes. Simply put, this is all the work that needs to be done before a housing developer comes on site – including site clearance, earthworks and construction of infrastructure assets. For the purpose of this plan, infrastructure has been

categorised into five main asset types: transport, utilities, water supply, stormwater and wastewater. There are two main types of emissions:

- **Embodied emissions** are the greenhouse gas emissions associated with the creation and refurbishment of an asset – including construction energy, materials and transportation of products.
- **Operational emissions** are the greenhouse gas emissions associated with the operation of infrastructure required to enable it to operate and deliver its service.

There are also enabled emissions (i.e. emissions that only occur because of the infrastructure we build, such as someone driving on a road) associated with infrastructure. These are covered in the transport section of this plan.

It's also important to acknowledge that our activities may result in other organisations producing emissions; for example, enabling 2,000 new homes in an area may trigger a new school to be built. Currently, these emissions are not accounted for in our inventory as they are not within our direct control. However, we should consider the impact of our decisions, so we will continue to work closely with our stakeholders and partners to minimise these impacts.

5.2 Control and influence

Within the infrastructure sector, Kāinga Ora is uniquely positioned to drive emissions reductions. This is because we work across all asset types, at a national level and at a scale that means we can improve the coordination, knowledge and innovation across different infrastructure asset owners.

We have the greatest ability to reduce emissions within the infrastructure sector before the decision to build infrastructure is made.

This is through where we choose to locate our developments, how we choose to utilise existing assets, and how we optimise broader government investments.

One lever we have available to accelerate change is the Infrastructure Acceleration Fund, which is administered by Kāinga Ora and supports the construction of critical infrastructure needed for development. This can be particularly useful when we need to bring forward infrastructure projects that are already planned but asset owner funding isn't available for years to come. We can leverage this fund to drive emissions reduction by accelerating projects that unlock emissions reduction earlier (e.g. cycling improvements), or through including specific criteria in project agreements.

In some cases, our ability to influence infrastructure emissions is limited. This is because Kāinga Ora is not the final asset owner. We do not control the design standards or material specifications for infrastructure as these are largely set by the asset owner. We are also sometimes limited by the type of asset our partners are willing to accept (e.g. some asset owners are concerned about nature-based solutions because of ongoing operational costs).



Summary of transport interventions see pg xx

Baseline Infrastructure Emissions



FY23

18,089 tCO₂e

FY23 – FY30

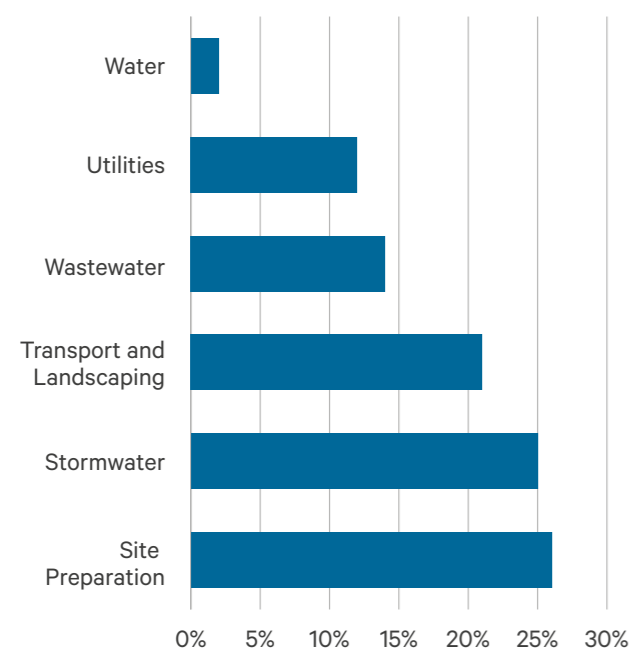
138,524 tCO₂e
~ 17,316 tCO₂e per annum

5.3 Baseline infrastructure emissions

Our infrastructure emissions for the FY23 base year are a total of 18,089 tCO₂e.

Almost 75% of infrastructure emissions are associated with site preparation,¹⁵ stormwater infrastructure and road infrastructure (Figure 13).

Figure 13 Base year (FY23) infrastructure emissions by asset type



Our infrastructure emissions baseline (FY23 – FY30) is a total of 138,524 tCO₂e with emissions peaking in FY24 and FY28 (Figure 13).

15. Our modelling determined that site preparation includes house demolition, removal of water and transport assets, bulk earthworks and excavation.

The spread of infrastructure emissions by asset type is similar between the baseline and base year. The emissions are relatively evenly split between materials; and transport to site and on-site energy. Of the material emissions, almost 50% is associated with concrete, ~25% with aggregate, and ~20% with plastic.

Even though operational emissions are not within our scope, a significant amount of emissions will result from the ongoing maintenance and replacement of the assets we deliver. Kāinga Ora can influence these emissions through the longevity of materials we select during design.

Kāinga Ora is already taking a range of actions to reduce our emissions. These are already funded and underway; however, further work is needed to quantify their impact at a portfolio level. These actions include:

- Delivering and enabling increased density through our Large-Scale Projects. This optimises existing infrastructure capacity and reduces the volume of new infrastructure to be built, thus reducing emissions.
- Achieving 87% of demolition waste diverted from landfill during FY21/22, exceeding our 80% target, and we relocated 58 homes.
- Starting a piece of work to align our work programme with asset owners so that excavation activities align at the same time, reducing emissions and minimising community disruption.
- Delivering some nature-based solutions, for example Greenslade Reserve and Freeland Reserve, which can reduce emissions and build climate resilience, as was proven on these sites during Cyclone Gabrielle.

5.4 Targets

There is no national emissions target set for the infrastructure sector to guide us, so we have taken a lead from the key infrastructure owning organisations we work with. We have elected to follow their approach.¹⁶

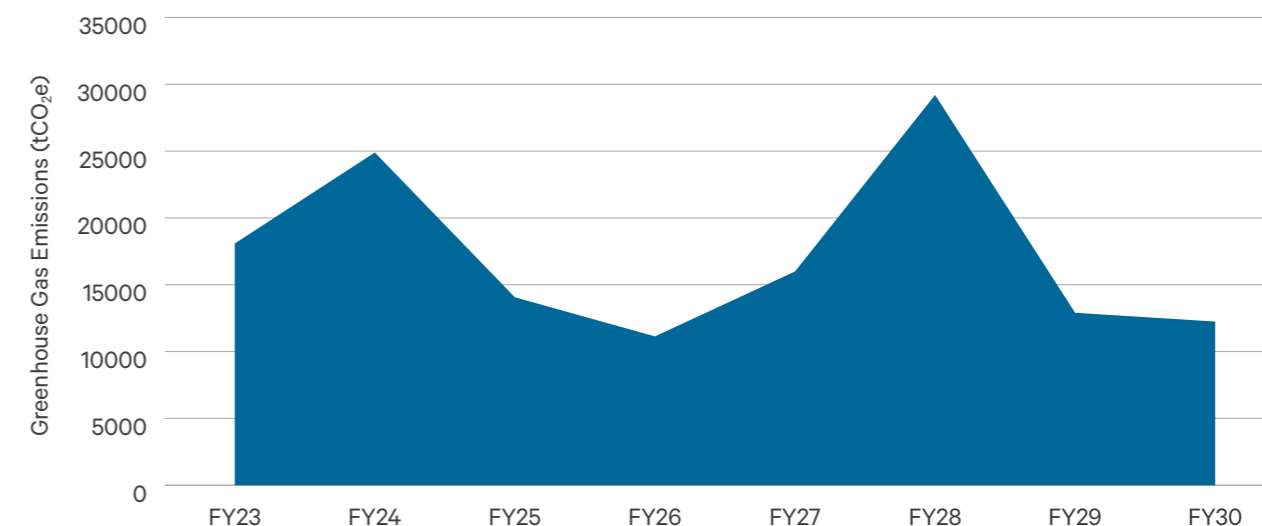
On that basis, we have adopted a 42% reduction target by FY30, compared to our FY23 base year.

Within our current funding and operational settings we do not expect to be able to achieve a reduction in infrastructure emissions.¹⁷

This is because we have only recently developed our infrastructure emissions baseline in July 2023 and do not yet understand our reduction potential. Once we have undertaken this further work, we will update this document.

We will therefore need to deliver an additional 42% emissions reduction by FY30 to achieve the target. Under our current funding and operational settings, we do not expect to achieve this target.

Figure 14 Kāinga Ora infrastructure emissions baseline



16. This target has been set using the Science Based Target Initiative (SBTI) assessment methodology, which follows the same approach as Auckland Transport. More details on the methodology can be found at <https://sciencebasedtargets.org/step-by-step-process#develop-a-target>

17. The CNGP requires us to report on our gross emissions reduction that can be achieved based on our reduction potential for FY25 and FY30, against our FY23 baseline. We have interpreted this to be what we expect is achievable within our current funding and operational settings. We have calculated this to be a reduction of 0% by FY25, and 0% by FY30, compared to our FY23 baseline. These figures will be used for reporting under Carbon Neutral Government Programme requirements.

5.5 Reduction strategies

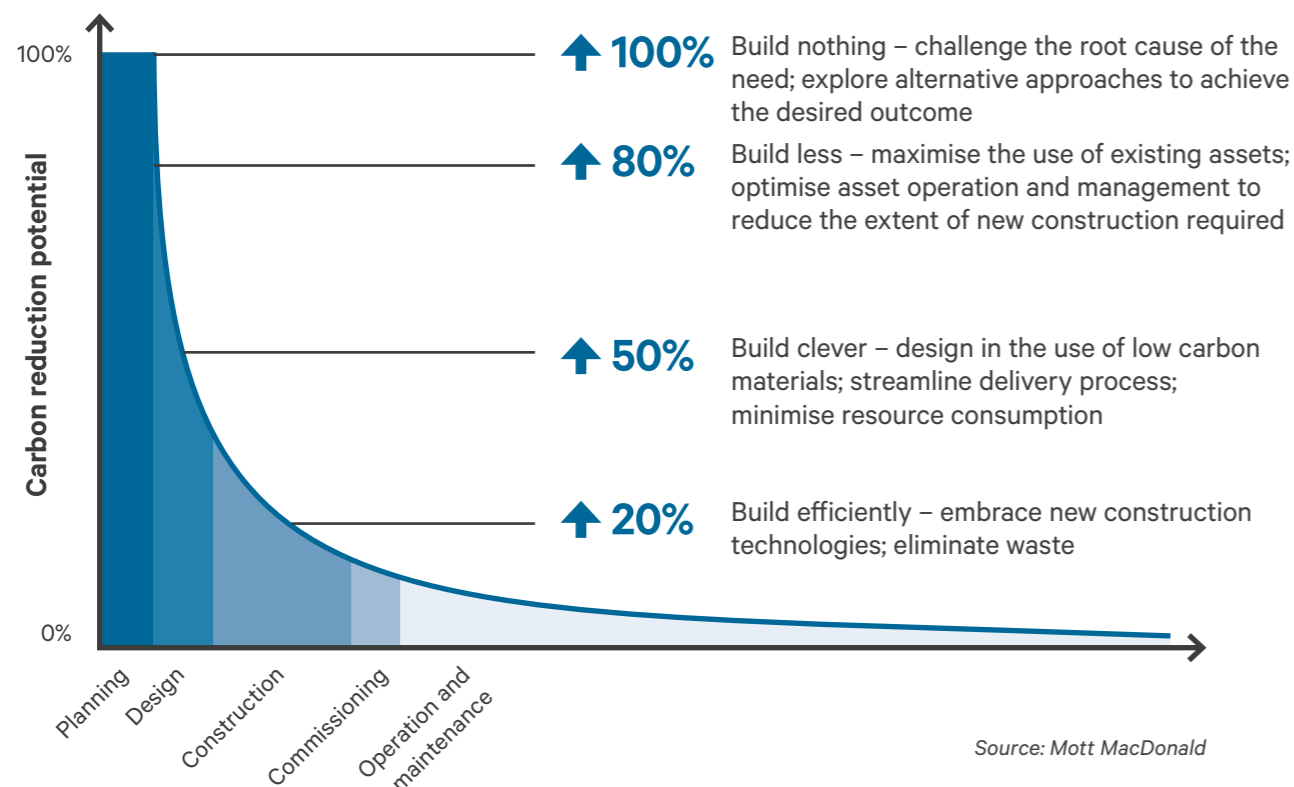
Compared to other sectors, the infrastructure industry has not progressed as far with emissions reduction strategies, or quantifying the benefits of certain actions. Currently, many emissions reduction strategies focus on low-emissions materials and technologies. While these may help to reduce emissions, there is a greater need to prioritise strategies further up on the carbon reduction hierarchy (Figure 15), which can be more cost-effective.

To achieve our target, we will need to focus on ‘building less’ and ‘building clever’ (Figure 15) – this is where approximately 60% of our emissions are. If we build less, then fewer emissions are produced and costs are saved. This approach seeks to use existing infrastructure as efficiently as possible and underpins our reduction strategy. This is considered international best practice and is also being adopted by asset owners within New Zealand.

While developing our reduction strategy, we have also considered the actions outlined in the Aotearoa Emissions Reduction Plan. These tend to have a greater focus on making improvements to planning and infrastructure systems. Further work is required to provide direction on practical initiatives in the infrastructure space. While Kāinga Ora continues to support this work at a system level, we have identified practical interventions within our control to reduce infrastructure emissions.

We have grouped these interventions into three different reduction pathways. Our approach to developing these pathways has been mainly qualitative and considered various factors including the likely cost, feasibility, and emissions reduction potential and co-benefits. Further analysis is required to quantify the costs and benefits of the pathways.

Figure 15 Carbon Reduction Hierarchy



Reduction pathway 1

This pathway demonstrates the emissions reductions we can achieve within our current funding envelope. Some of these interventions are already being applied to our projects in an ad hoc way; however, this assumes that they are delivered across our entire LSP portfolio.



Taking a ‘dig once’ approach will minimise emissions.

- Taking a ‘dig once’ approach

Kāinga Ora currently works with other organisations, like Auckland Transport and Watercare, to coordinate work programmes and install services at the same time, thus minimising the number of times a road is dug up and new materials are placed. Kāinga Ora can use our influence to bring everyone together; however, we can’t control the work programme of asset owners. We expect this could reduce emissions by up to 11%.

- Integrating nature-based solutions

Nature-based solutions, also referred to as green infrastructure, reduce the need for built infrastructure made of materials that carry embodied emissions. Examples of nature-based solutions include raingardens, swales or wetlands. Kāinga Ora has already delivered a number of projects that integrate nature-based solutions where the designs have been feasible, cost-effective and accepted by asset owners (e.g. Greenslade Reserve and Freeland Reserve). We expect this could reduce emissions by up to 3%.



Integrating nature-based solutions can reduce the need for built infrastructure.

Reduction pathway 2

This proposed pathway reduces infrastructure emissions by focusing on delivering interventions that are within our control and achieve cost savings, or are cost neutral. However, we need to understand the feasibility of delivering these, as they are not industry standard, and the emissions impact they deliver.

If trials are successful, this pathway would use these interventions across our LSP portfolio.



Establishing soil transfer stations can reduce emissions from waste transportation and the volume of waste sent to landfill.

- **Establishing soil transfer stations:** We can store excavated material on a vacant site nearby so that it can be beneficially reused at the end of the project instead of transporting it to a disposal site. This reduces emissions by reducing the volume of waste sent to landfill and reducing transport. We can easily include this intervention within our contracts, although we will need to overcome challenges of limited space and logistics. We expect this could reduce emissions by up to 7%.



Enabling peak load management reduces electricity demand and minimises the need to upgrade network infrastructure.

- **Enabling peak load management:** We can work with energy distribution companies to enable demand-side management to reduce the electricity demand during peak times and minimise the need to upgrade network infrastructure, thus minimising the associated construction emissions. This intervention also supports future residents within the development to reduce energy consumption and therefore emissions. The success of this intervention depends on customer uptake. Further work is required to understand the emissions reduction potential of this.
- **Scaling up nature-based solutions:** Currently, nature-based solutions are delivered on an ad hoc basis. This pathway proposes that nature-based solutions would be scaled up and delivered portfolio wide. Further work is required to understand the emissions reduction potential of this at a portfolio level.

Reduction pathway 3

This pathway includes interventions that, may be more challenging to deliver because of funding constraints. Delivering them would have the additional benefit of supporting a lower-emissions economy and shifting best practice across industry. These interventions include:

- All interventions in reduction pathways 1 and 2
- **Intensifying in areas that enable the efficient use of infrastructure:** Our LSPs are already delivering density in areas that optimise existing infrastructure. Kāinga Ora could expand on the success of these projects by establishing a stronger policy on where we invest and deliver new housing. This could mean that we do not invest in areas where the cost to build and maintain infrastructure per person is over a certain threshold. This intervention would require additional funding to enable us to acquire land that enables efficient use of infrastructure.
- **Low-emissions materials that are allowed by asset owners:** A large proportion of our emissions come from materials, particularly concrete and aggregate. We can specify the use of low-emissions materials instead of standard materials; however, we must continue to meet the material specifications and design standards set by asset owners. Further work is required to understand the most feasible materials to use and how these can be rolled out at scale.



Reduction pathway 4

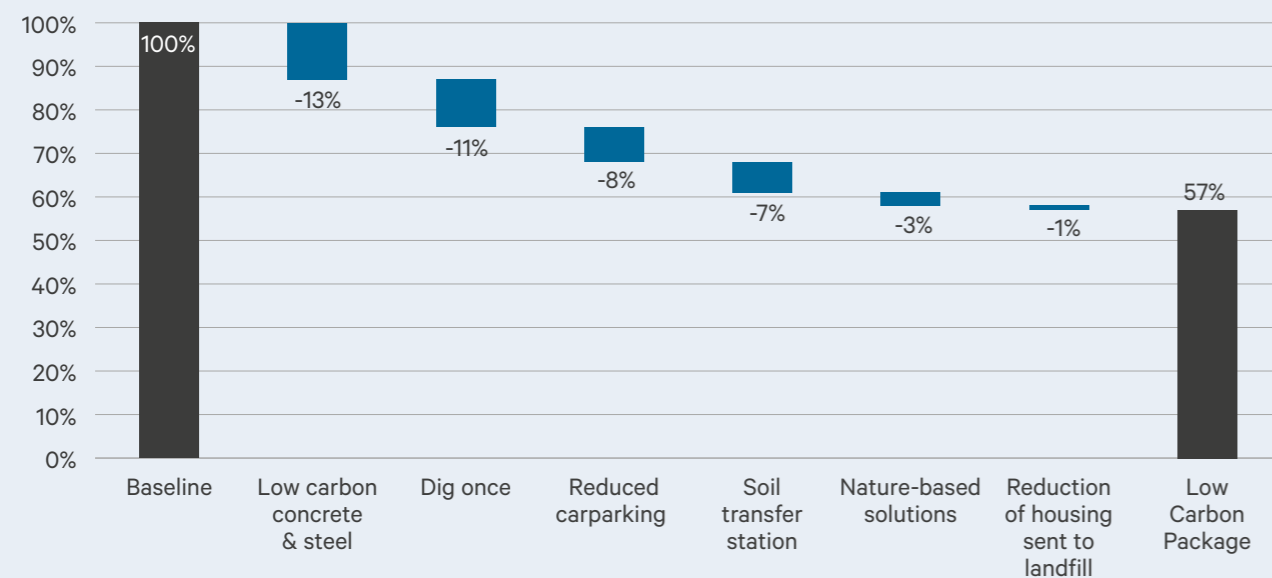
This pathway includes interventions that, while potentially effective, may be difficult to implement for various reasons such as additional cost incurred, increased risk or they sit outside our direct control. They rely on further work to be undertaken by us and the industry to understand their impacts and benefits.

- All interventions in reduction pathways 1–3
- **Use low-emissions materials that are not allowed by asset owners:** As the supply chain responds to industry’s demand for low-emissions solutions, more and more new products become available. These new

products may not initially meet the material specifications or design standards set by asset owners and so require more testing before asset owners allow them to be used. This generally incurs more cost, time and risk for all involved. However, the benefits of these products may outweigh the costs and therefore should still be considered within emissions reduction strategies.

- **Efficient construction technologies:** This may include technology such as electric plant and equipment, digital twins, or biofuel. Further work is required to understand the impact and benefits of new construction technologies.

Figure 16 Impact of Infrastructure Interventions at a Project Level



5.6 Equitable transition and Māori considerations

Transitioning to a sustainable, inclusive and resilient economy will transform many aspects of our society. A transition that is carefully managed and includes everyone can ensure that we reduce our emissions while improving wellbeing for all.

To ensure that this transition is equitable, fair and inclusive within the context of infrastructure, we will need to:

- Work collaboratively and inclusively with affected groups to understand their needs and any possible barriers to overcome. This includes Māori communities who may be impacted by land use changes.
- Establish a clear plan for businesses, including Māori-owned businesses, to ensure they are adequately supported in the transition to low-emissions practices.

Within the infrastructure sector there is also an opportunity to promote nature-based solutions, over hard engineering ones. We need to value the role this can play in regenerating urban areas – and enriching natural environments – something that we heard was a priority for Māori.

5.7 Co-benefits

Delivering these emissions reduction interventions provides the opportunity to achieve other environmental benefits such as a reduction in waste, and improved climate resilience.

We are also in the position to use the scale of our infrastructure investment to increase the capacity and capability of suppliers to deliver low-emissions solutions and support a low-emissions economy.


5.8 Key assumptions and exclusions

Our infrastructure emissions modelling was undertaken by Mott MacDonald and completed in July 2023. Where sufficient project information was available, emissions were calculated using the Moata Carbon Portal, a carbon modelling software developed by Mott MacDonald. Where information was not available or was insufficient, Mott MacDonald derived carbon:cost factors to develop an indicative emissions estimate. Approximately 50% of the total baseline was able to be estimated using the Moata Carbon Portal.

This approach has its limitations as it is possible that the carbon intensity of the unmodelled projects may differ from the modelled projects. In addition, there is no universally accepted methodology for calculating the carbon:cost factors. As a result, the baselining exercise has been useful for providing a high-level assessment of emissions across our infrastructure portfolio but the results must be interpreted with care.

The scope of the emissions modelling focused on infrastructure projects within our LSPs as this is where the majority of infrastructure expenditure is for the FY23 – FY30 period. Emissions from the Kāinga Ora Land Programme have not been included in the emissions baseline because we are still working to capture this information reliably.

Our scope of emissions covers capital emissions only (A1–A5). We have separately modelled operational emissions (B2–B7) associated with the infrastructure we deliver to understand how decisions made during design and construction impact whole-of-life emissions. Other emissions (B1, B8, B9, C1–C4 and D) were excluded as they are either covered elsewhere (e.g. transport), are outside of scope, or are considered insignificant.

 Appendix

Glossary

Amenity	Amenity is used to refer to the places, goods, services and employment people need and want to access.
Aotearoa ERP	The Aotearoa ERP ¹⁸ refers to the national emissions reduction plan prepared by the Government for all of New Zealand. Generally, an emissions reduction plan is a plan that sets out the policies and strategies to meet emissions budgets by reducing emissions and increasing removals. A new emissions reduction plan must be in place before the beginning of each emissions budget period.
Base year	We use the period from 1 July 2022 to 30 June 2023 (FY23) as our base year for all emissions sources. This captures the impact of our existing activities and the emissions reduction benefits of actions we already have underway.
Baseline	We use the baseline period from 1 July 2022 to 30 June 2030 for all emissions sources. This enables us to compare emissions information over time.
Biofuel	A fuel derived immediately from living matter/living materials.
Building Lifecycle Carbon Assessment	A quantitative technique of calculating the potential environmental impact of a building’s material, energy, and water consumption, over its full life from construction through to the disposal of demolition materials.
Carbon Dioxide Equivalent	The universal unit of measurement to indicate the global warming potential (GWP) of each GHG, expressed in terms of the GWP of one unit of CO ₂ . It is used to evaluate releasing (or avoiding releasing) different GHGs against a common basis.
Carbon neutrality (Also see Net Zero)	A target of completely negating the GHG emissions produced by human activity. This can be done by balancing emissions and removals or by eliminating the production of emissions in the first place.
Climate Change	Refers to long-term shifts in temperatures and weather patterns. Human activities are the main driver of climate change, primarily due to the burning of fossil fuels like coal, oil and gas.
CNGP	Carbon Neutral Government Programme. On 2 December 2020, the New Zealand Government announced the CNGP – with the aim of reducing GHG emissions faster and working towards carbon neutrality by 2025. This programme was formed to demonstrate government leadership in emissions reduction, inspiring other sectors, and achieving carbon neutrality by 2025.

18. Minister of Climate Change, & Ministry for the Environment Manatū Mō Te Taiao. (2022, May 16). Aotearoa New Zealand’s first emissions reduction plan (ME 1639). <https://environment.govt.nz/publications/aotearoa-new-zealands-first-emissions-reduction-plan/>

Cost-neutral	When all of the costs of implementing a project equal the benefits of implementing a project.
Decarbonisation	The process of reducing of carbon dioxide emissions.
Demolition	The act of dismantling or destroying a building or structure or any part thereof.
Earthworks	Removal or placement of soils and other excavated material to create an ideal base for construction.
EAST	Easy Access and Sustainable Transport – An internal report completed by Kāinga Ora looking at how can Kāinga Ora support the wellbeing of public housing customers through transport, meet our climate change commitments, and address parking issues in medium/high density developments.
e-bikes	Electric bicycles.
Electrifying	The process whereby we substitute fossil-fuel sources of power – such as coal, oil and gas – with electricity generated from renewable energy sources, like solar, wind, hydro and geothermal.
Embodied emissions	Emissions associated with the production of materials and construction processes throughout the lifespan of a building, including during construction, renovation, ongoing use and demolition.
Emission Reduction Plan	Refers to this document.
Emissions	The release of carbon (And carbon dioxide equivalents) into the atmosphere.
Energy efficiency	The use of less energy to perform the same task or produce the same result.
EPDs	Environmental Product Declarations.
E-Vehicle	Electric Vehicle.
GHG (Greenhouse Gas)	Atmospheric gases that trap or absorb heat and contribute to climate change. The gases covered by the Climate Change Response Act 2002 are carbon dioxide (CO ₂), methane (CH ₄), nitrous oxide (N ₂ O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF ₆).
GPS HUD	The Government Policy Statement on Housing and Urban Development (GPS-HUD) ¹⁹ sets a direction for housing and urban development in Aotearoa New Zealand. The GPS-HUD’s vision is that everyone in New Zealand lives in a home and a community that meets their needs and aspirations.

19. Government policy statement on housing and urban development (GPS-HUD) | Te Tūāpapa Kura Kāinga. (n.d.). Te Tūāpapa Kura Kāinga - Ministry of Housing and Urban Development. <https://www.hud.govt.nz/our-work/government-policy-statement-on-housing-and-urban-development/>

Green star rating	Green Star assesses the important elements of a project’s sustainability across key categories. Each category includes benchmark for a lower-carbon, healthy project. Points are awarded for successfully meeting these criteria. The total number of points awarded decides the final Green Star rating ²⁰
Gross Emissions	GHG emissions to the atmosphere. Total gross GHG emissions for Kāinga Ora excludes any GHG removals
H1 clause	Latest building code: The H1 Clause of the Building Code regulates the energy efficiency of the built environment – covering wall, floor and ceiling insulation, as well as the thermal performance of windows and doors.
Hapori	A group, family or community.
High density	Within Kāinga Ora we use high density housing to refer to our walk-up and apartment housing.
Homestar building standard	The comprehensive, independent rating tool that measures and rates the performance of New Zealand homes.
Infrastructure Acceleration Fund	This fund is administered by Kāinga Ora and supports the construction of critical infrastructure needed for development.
Intensification	Enabling more housing in areas where people want to live.
Kanohi ki te kanohi	A face to face, in person meeting and an opportunity to encounter Māori protocols and culture directly.
LED	Light-emitting diode (LED) is a semiconductor device that emits light when an electric current flows through it.
Low density	Within Kāinga Ora, we use low density housing to typically refer to stand-alone dwellings, generally 1 – 2 storeys, on an individual section.
LSPs	LSPs are long-term urban renewal projects located in areas with significant Kāinga Ora land and public houses that need replacement. LSPs present an opportunity to provide new fit-for-purpose public homes, increase housing supply across a range of tenures, and increase housing density in places close to jobs, schools and services.
MSM model	The Auckland Macro Strategic Model (MSM) is the multi-modal (vehicles and passenger transport) travel demand model of the Auckland region, which is managed by the Auckland Forecasting Centre. It incorporates land-use forecasts from the Auckland Council with assumptions about future economic conditions, transport policies and investments, which are used to forecast typical weekday peak period travel demands over the next three decades.

20. Green Star. New Zealand Green Building Council. (n.d.). <https://www.nzgbc.org.nz/greenstar>

Mitigation	Human actions to reduce emissions by sources or enhance removals by sinks of GHGs. Examples of reducing emissions by sources include walking instead of driving, or replacing a coal boiler with a renewable electric-powered one. Examples of enhancing removals by sinks include growing new trees to absorb carbon, or industrial carbon capture and storage activities.
NABERS rating	The National Australian Built Environment Rating System is a system for rating the energy efficiency of office buildings. It is an independent tool, backed by the New Zealand government.
Operational emissions	Emissions from operating a building.
Public and Supported Housing	Kāinga Ora programme: Rental accommodation for people who can’t afford to live in a private rental, so the Government pays a portion of rent. Supported Housing brings together publicly funded housing with support services that are essential to the wellbeing of people and whānau living in the home.
Removals	The removal of carbon dioxide from the atmosphere. A synonym for sequestration. In Aotearoa New Zealand, this usually refers to absorption of carbon by forests as trees grow.
Retrofit	Kāinga Ora term used to refer to any improvement work on an existing building to improve its energy efficiency, making them easier to heat, able to retain that heat for longer, and replacing fossil fuels with renewable energy.
Taonga	An object or natural resource which is highly treasured within Māori culture.
tCO ₂ e	Tonnes of carbon dioxide equivalent see CO ₂ e
Te Taiao	The natural world that contains and surrounds us. The land, water, climate and living beings.
Tier 1	A class of urban environment as defined in the National Policy Statement on Urban Development 2020. Tier 1 consists of urban environments in Auckland, Tauranga, Hamilton, Wellington and Christchurch.
Transition	The shift to a low-emissions, sustainable economy and way of life.
Typologies	Classification system used to categorize buildings based on their function, form, and construction (e.g. apartments, stand-alone dwellings, terraced housing)
Urban form	Used to describe a city’s characteristics, including the design and structure of an area or community. Including what type of development is allowed and where. It includes buildings, as well as the spaces between them.
Vehicle kilometres travelled (VKT)	The number of kilometres travelled across a number of vehicles. For example, 4 people in one car travelling 1 kilometre is 1 VKT.
Wāhi tapu	A place sacred to Māori in the traditional, spiritual, religious, ritual, or mythological sense.

Engagement list

In developing this plan, we have engaged with:

Government departments:

- Ministry for the Environment
- Ministry of Business, Innovation and Employment
- Ministry of Health
- Ministry of Housing and Urban Development
- Ministry of Transport
- The Treasury

Crown agents:

- Energy Efficiency and Conservation Authority
- Waka Kotahi
- Crown entities:
- Te Waihanga (New Zealand Infrastructure Commission)

Local government:

- Auckland Council
- Auckland Transport
- Environment Canterbury
- Watercare
- Wellington Water

Iwi representatives and Māori organisations:

- Hapū Iwi Trust
- Ngā Maunga Whakahī o Kaipara Whenua Hoko Holdings Ltd
- Ngāi Takoto
- Ngāti Hāua Iwi Trust
- Ngāti Hine
- Ngāti Kahu
- Ngāti Korora
- Ngāti Kuri
- Ngāti Maniapoto
- Ngāti Takapari
- Ngāti Tamaoho
- Ngāti Tūwharetoa
- Ngāti Whātua
- Te Aupōuri
- Te Rarawa
- Te Rūnanga o Ngāti Whātua
- Te Waiariki
- Te Whare Ruruhou o Meri Trust
- TOA Architects

Other organisations:

- BRANZ Limited
- University of Otago, Wellington

Detailed figures

Kāinga Ora estimated emissions

Annual emissions (tCO ₂ e)	2023 (Base year)	2025	2030	2035	2023- 2035
Transport emissions					
If we hadn't made any changes	277,382	328,849	494,595	592,798	5,854,122
<i>Intensification through large-scale projects and public housing</i>	-13,988	-39,931	-113,785	-155,693	-1,213,027
Total emissions for CNGP Baseline	263,394	288,917	380,810	437,105	4,641,095
% Change	-5%	-12%	-23%	-26%	-21%
Buildings emissions					
If we hadn't made any changes	318,355	431,370	363,812	333,916	4,794,835
<i>Our completed retrofit and renewal programmes</i>	-20,349	-35,725	-47,127	-47,127	-551,648
Total emissions for CNGP Baseline	298,006	395,645	316,685	286,790	4,243,188
% Change	-6%	-8%	-13%	-14%	-12%
Corporate emissions					
If we hadn't made any changes	10,759	10,759	10,759	10,759	86,072
Our EV programme	-1,183	-1,183	-1,183	-1,183	-9,468
<i>Flexible working policy</i>	-1,076	-1,076	-1,076	-1,076	-8,607
Total emissions for CNGP Baseline	8,500	8,500	8,500	8,500	110,500
% Change	-21%	-21%	-21%	-21%	-21%
Infrastructure emissions					
Total emissions for CNGP Baseline	18,089	14,061	12,246	12,246	199,754
Total					
Total emissions if we hadn't made any changes	624,586	785,039	881,412	949,719	10,934,783
<i>Total expected reductions resulting from our actions</i>	-35,521	-76,840	-162,096	-204,003	-1,774,143
Total emissions for CNGP Baseline	587,989	707,123	718,241	744,641	9,194,537
% Change	-6%	-10%	-18%	-21%	-16%

Kāinga Ora additional reduction strategies

Annual emissions (tCO ₂ e)	2025	2030	2035	2023-2035
Transport reduction pathway 1 – Investment only in low VKT areas				
Total change compared to if we hadn't made any changes	-1,030	-42,929	-75,651	-122,940
% change in transport emissions compared to if we hadn't made any changes	-0.3%	-8.7%	-12.8%	-2.1%
% change in total emissions compared to if we hadn't made any changes	-0.1%	-4.9%	-8.0%	-1.1%
% change in transport emissions compared to FY23 CNGP baseline	-0.4%	-16.3%	-28.7%	
Transport reduction pathway 2 – Public Housing Bikes programme				
Total change compared to if we hadn't made any changes	-28,506	-60,226	-66,902	-321,377
% change in transport emissions compared to if we hadn't made any changes	-8.7%	-12.2%	-11.3%	-5.5%
% change in total emissions compared to if we hadn't made any changes	-3.6%	-6.8%	-7.0%	-2.9%
% change in transport emissions compared to FY23 CNGP baseline	-10.8%	-22.9%	-25.4%	
Transport reduction pathway 3 – Support EV uptake				
Total change compared to if we hadn't made any changes	-3,756	-9,168	-18,945	-42,107
% change in transport emissions compared to if we hadn't made any changes	-1.1%	-1.9%	-3.2%	-0.7%
% change in total emissions compared to if we hadn't made any changes	-0.5%	-1.0%	-2.0%	-0.4%
% change in transport emissions compared to FY23 CNGP baseline	-1.4%	-3.5%	-7.2%	
Buildings reduction pathway 1 – Continue retrofit and renewal programmes				
Total change compared to if we hadn't made any changes	-	-11,677	-31,060	-32,426
% change in buildings emissions compared to if we hadn't made any changes	0.0%	-3.2%	-9.3%	-0.7%

Annual emissions (tCO ₂ e)	2025	2030	2035	2023-2035
% change in total emissions compared to if we hadn't made any changes	0.0%	-1.3%	-3.3%	-0.3%
% change in buildings emissions compared to FY23 CNGP baseline	0.0%	-3.9%	-10.4%	
Buildings reduction pathway 2 – Retrofit hot water heat pumps				
Total change compared to if we hadn't made any changes	-12,908	-38,816	-28,729	-198,339
% change in buildings emissions compared to if we hadn't made any changes	-3.0%	-10.7%	-8.6%	-4.1%
% change in total emissions compared to if we hadn't made any changes	-1.6%	-4.4%	-3.0%	-1.8%
% change in buildings emissions compared to FY23 CNGP baseline	-4.3%	-13.0%	-9.6%	
Buildings reduction pathway 2 – hot water heat pumps, mechanical ventilation with heat recovery and low-emissions concrete				
Total change compared to if we hadn't made any changes	-682	-6,969	-6,969	-23,328
% change in buildings emissions compared to if we hadn't made any changes	-0.2%	-1.9%	-2.1%	-0.5%
% change in total emissions compared to if we hadn't made any changes	-0.1%	-0.8%	-0.7%	-0.2%
% change in buildings emissions compared to FY23 CNGP baseline	-0.2%	-2.3%	-2.3%	
Buildings reduction pathway 3 – Low embodied emissions buildings				
Total change compared to if we hadn't made any changes	-	-62,207	-62,207	-183,448
% change in buildings emissions compared to if we hadn't made any changes	0.0%	-17.1%	-18.6%	-3.8%
% change in total emissions compared to if we hadn't made any changes	0.0%	-7.1%	-6.6%	-1.7%
% change in buildings emissions compared to FY23 CNGP baseline	0.0%	-20.9%	-20.9%	
Corporate emissions pathway 1 – 42% emissions reduction by 2030				
Total change compared to if we hadn't made any changes	-3,633	-5,368	-5,368	-33,043

Annual emissions (tCO ₂ e)	2025	2030	2035	2023-2035
Total change compared to CNGP baseline	-1,848	-3,583	-3,583	-311710.9%
% change in corporate emissions compared to if we hadn't made any changes	-33.8%	-49.9%	-49.9%	-38.4%
% change in total emissions compared to if we hadn't made any changes	-0.5%	-0.6%	-0.6%	-0.3%
% change in corporate emissions compared to FY23 CNGP baseline	-21.7%	-42.2%	-42.2%	
Infrastructure emissions pathway 1 – coordinate work programmes				
Total change compared to if we hadn't made any changes	-	-367	-367	-5,993
% change in infrastructure emissions compared to if we hadn't made any changes	0.0%	-3.0%	-3.0%	-3.0%
% change in total emissions compared to if we hadn't made any changes	0.0%	0.0%	0.0%	-0.1%
% change in infrastructure emissions compared to FY23 CNGP baseline	0.0%	-2.0%	-2.0%	
Infrastructure emissions pathway 2 – optimise infrastructure				
Total change compared to if we hadn't made any changes	-	-857	-857	-13,983
% change in infrastructure emissions compared to if we hadn't made any changes	0.0%	-7.0%	-7.0%	-7.0%
% change in total emissions compared to if we hadn't made any changes	0.0%	-0.1%	-0.1%	-0.1%
% change in infrastructure emissions compared to FY23 CNGP baseline	0.0%	-4.7%	-4.7%	
Total potential additional reduction in each period				
Total change compared to if we hadn't made any changes	-49,484	-183,978	-190,344	-821,618
% change in total emissions compared to if we hadn't made any changes	-7%	-26%	-26%	-9%

Kāinga Ora current emissions reduction by category

Annual emissions (tCO ₂ e)	2025	2030	2035	2023-2030
% of category				
Transport	-12.1%	-23.0%	-26.3%	-20.7%
Buildings	-8.3%	-13.0%	-14.1%	-11.5%
Corporate	-21.0%	-21.0%	-21.0%	-21.0%
Infrastructure	0.0%	0.0%	0.0%	0.0%
% of total emissions				
Transport	-5.1%	-12.9%	-16.4%	-11.1%
Buildings	-4.6%	-5.3%	-5.0%	-5.0%
Corporate	-0.2%	-0.1%	-0.1%	-0.1%
Infrastructure	0.0%	0.0%	0.0%	0.0%
Total	-9.8%	-18.4%	-21.5%	-16.2%

Kāinga Ora additional emissions reduction potential by category

Annual emissions (tCO ₂ e)	2025	2030	2035	2023-2030
% of category				
Transport	-11.5%	-29.5%	-36.9%	-10.5%
Buildings	-3.4%	-34.1%	-34.1%	-9.5%
Corporate	-21.7%	-42.2%	-42.2%	-29.9%
Infrastructure	0.0%	-10.0%	-10.0%	-10.0%
% of total emissions				
Transport	-4.2%	-12.7%	-17.0%	-4.4%
Buildings	-1.7%	-12.3%	-10.3%	-3.7%
Corporate	0.0%	0.0%	0.0%	0.0%
Infrastructure	0.0%	-0.1%	-0.1%	-0.2%
Total	-6.0%	-25.1%	-27.4%	-8.3%

Total emissions reductions compared to if we hadn't made any changes

	2025	2030	2035	2023-2030
Included in our CNGP baseline				
If we hadn't made any changes	785,039	881,412	949,719	10,934,783
Intensification through LSPs and of PH	-39,931	-113,785	-155,693	-1,213,027
Our retrofit and Homestar programmes	-35,725	-47,127	-47,127	-551,648
Our EV programme	-1,183	-1,183	-1,183	-9,468
Our CNGP Baseline for reporting purposes	708,198	719,316	745,716	9,160,641
% reduction	9.8%	18.4%	21.5%	16.2%
Additional potential emissions reductions				
Transport reduction pathways	-33,291	-112,323	-161,498	-486,425
Buildings reduction pathways	-13,589	-107,991	-97,905	-405,114
Corporate reduction pathways	-3,633	-5,368	-5,368	-33,043
Infrastructure reduction pathways	-	-1,225	-1,225	-19,975
Potential reduction target	657,685	492,410	479,721	8,216,083
% reduction	16.2%	44.1%	49.5%	24.9%

Kāinga Ora targets for CNGP

Annual emissions (tCO ₂ e)	2025	2030	2035	2023-2030
Transport				
Buildings				
Corporate	-22%	-42%	-42%	-30%
Infrastructure				

Kāinga Ora ERP targets

Annual emissions (tCO ₂ e)	2025	2030	2035	2023-2030
Target % of category				
Transport	-22.3%	-45.7%	-53.5%	-29.0%
Buildings	-11.4%	-42.6%	-43.4%	-20.0%
Corporate	-44.8%	-60.9%	-60.9%	-49.4%
Infrastructure	0.0%	-10.0%	-10.0%	-10.0%
Current expected performance % of category				
Transport	-12.1%	-23.0%	-26.3%	-20.7%
Buildings	-8.3%	-13.0%	-14.1%	-11.5%
Corporate	-21.0%	-21.0%	-21.0%	-21.0%
Infrastructure	0.0%	0.0%	0.0%	0.0%
Target % of total emissions				
Transport	-9.3%	-25.7%	-33.4%	-15.5%
Buildings	-6.3%	-17.6%	-15.3%	-8.7%
Corporate	-0.6%	-0.7%	-0.7%	-0.4%
Infrastructure	0.0%	-0.1%	-0.1%	-0.2%
Total	-16.2%	-44.1%	-49.5%	-24.9%
Current expected performance % of total emissions				
Transport	-5.1%	-12.9%	-16.4%	-11.1%
Buildings	-4.6%	-5.3%	-5.0%	-5.0%
Corporate	-0.2%	-0.1%	-0.1%	-0.1%
Infrastructure	0.0%	0.0%	0.0%	0.0%
Total	-9.8%	-18.4%	-21.5%	-16.2%

