



# Council workshop: Carbon removals / Sequestration

04 June 2025

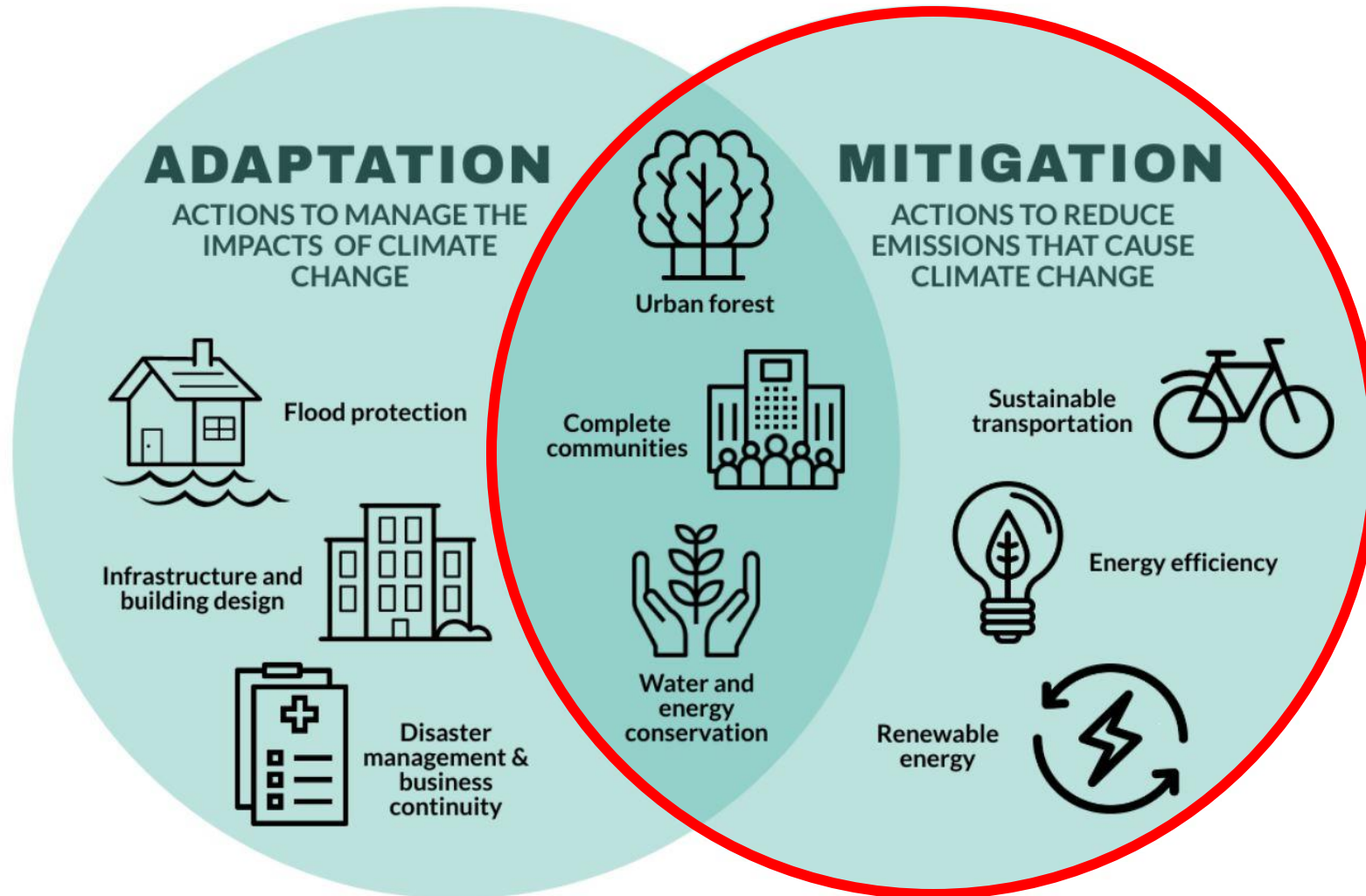
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- **B:** Key considerations for carbon removals
- **C:** Direction sought from Council
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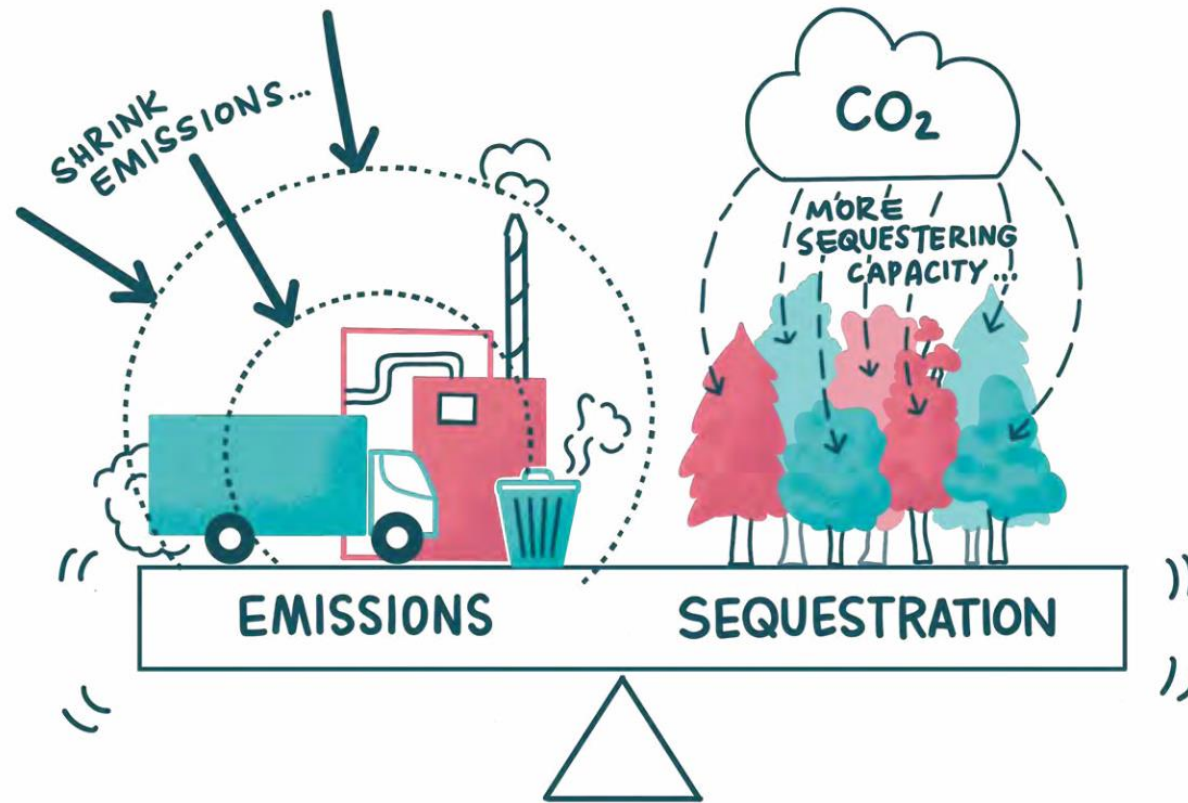


# A: Background and work to date

# Climate change has two faces



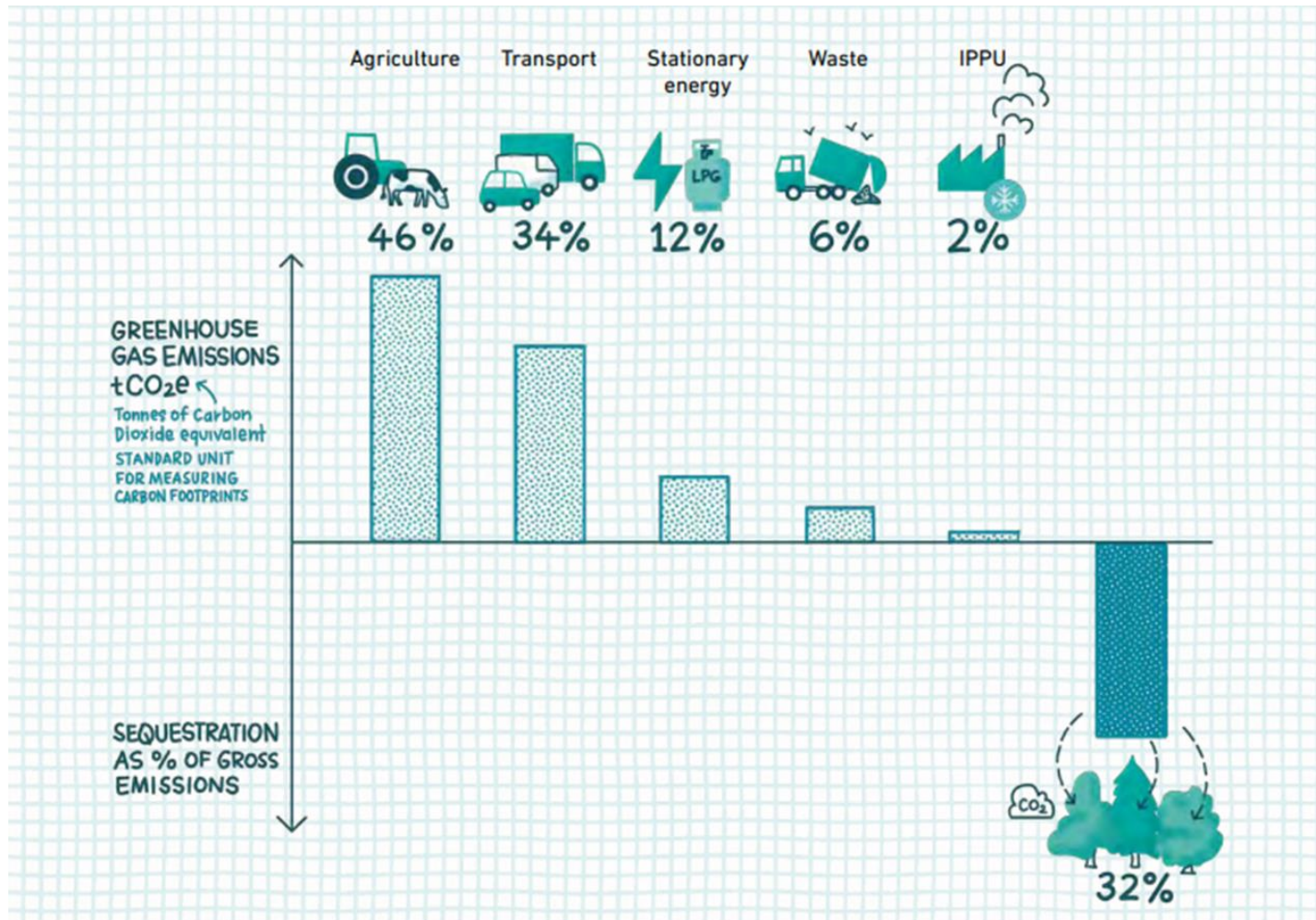
# Climate change mitigation =



reducing gross emissions + growing carbon removals

# Dunedin's existing carbon removals

- Variable due to planting/harvest cycles of commercial forestry, and market conditions in any given year



- In 2021/22, Dunedin's forests absorbed approximately 493,000tCO<sub>2</sub>
- Of this, 184,000tCO<sub>2</sub> was from indigenous vegetation, and net 309,000tCO<sub>2</sub> from exotic forestry (once harvest emissions are accounted for)
- Approximately 30,000tCO<sub>2</sub> of this is absorbed on DCC owned land

# Priority Zero Carbon Plan action areas for DCC



# Work to date

## 1. Review of context and relevant guidance

- International / national / regional context
- Requirements under common reporting frameworks (e.g. ISO + GPC)
- Best practice (e.g. Science-based Targets Initiative)

## 2. Initial stakeholder engagement

- Initial discussions with relevant DCC teams, DCHL and key external stakeholders

## 3. Policy directions memo / initial investment options

- Policy directions memo provided to ZCP Advisory Panel (Nov 24)
  - > ZCP AP advised Council workshop
- Initial carbon removals investment options to Council (Jan/May 25)
  - > Council funds Green & Blue Networks Plan for 2025/26



# B: Key considerations for carbon removals

# Carbon removals should be additional to emissions reduction efforts

- Best practice guidance (at all scales) emphasises gross emissions reduction over carbon removals
  - Even if an entity is fully offsetting residual emissions, 'net neutral' claims may not apply
- Why?
  - Fewer emissions = less planting (lower cost, more options)
  - Carbon removals can help 'buy time', but without emissions reduction there will be insufficient land area
  - Rapid, deep cuts in emissions are required to avoid catastrophic climate change

# Carbon removals need to be considered at multiple scales

- The DCC measures and manages emissions at two scales
  - **Dunedin:** 'net zero' target = emphasises sequestration
  - **DCC:** gross emissions target = no emphasis on sequestration
- The DCC's Zero Carbon Policy states that **options that contribute most to city emissions reduction targets should be prioritised**
  - Most DCC-owned land is within the Dunedin boundary. Sequestration on this land is a point of overlap between DCC and city scales.
  - Some in-district carbon removals that contribute to achieving a net neutral position for DCC or DCHL would also 'count' towards achievement of city targets.

## KEY CONSIDERATION 2

- Sequestration occurring at the **DCHL scale** is also a consideration
  - Some DCHL companies have net zero targets
  - City Forests has significant areas of commercial forestry registered under the Emissions Trading Scheme (not counted against the City Forests inventory)
  - City Forests have areas of indigenous vegetation that are counted as sequestration on their inventory



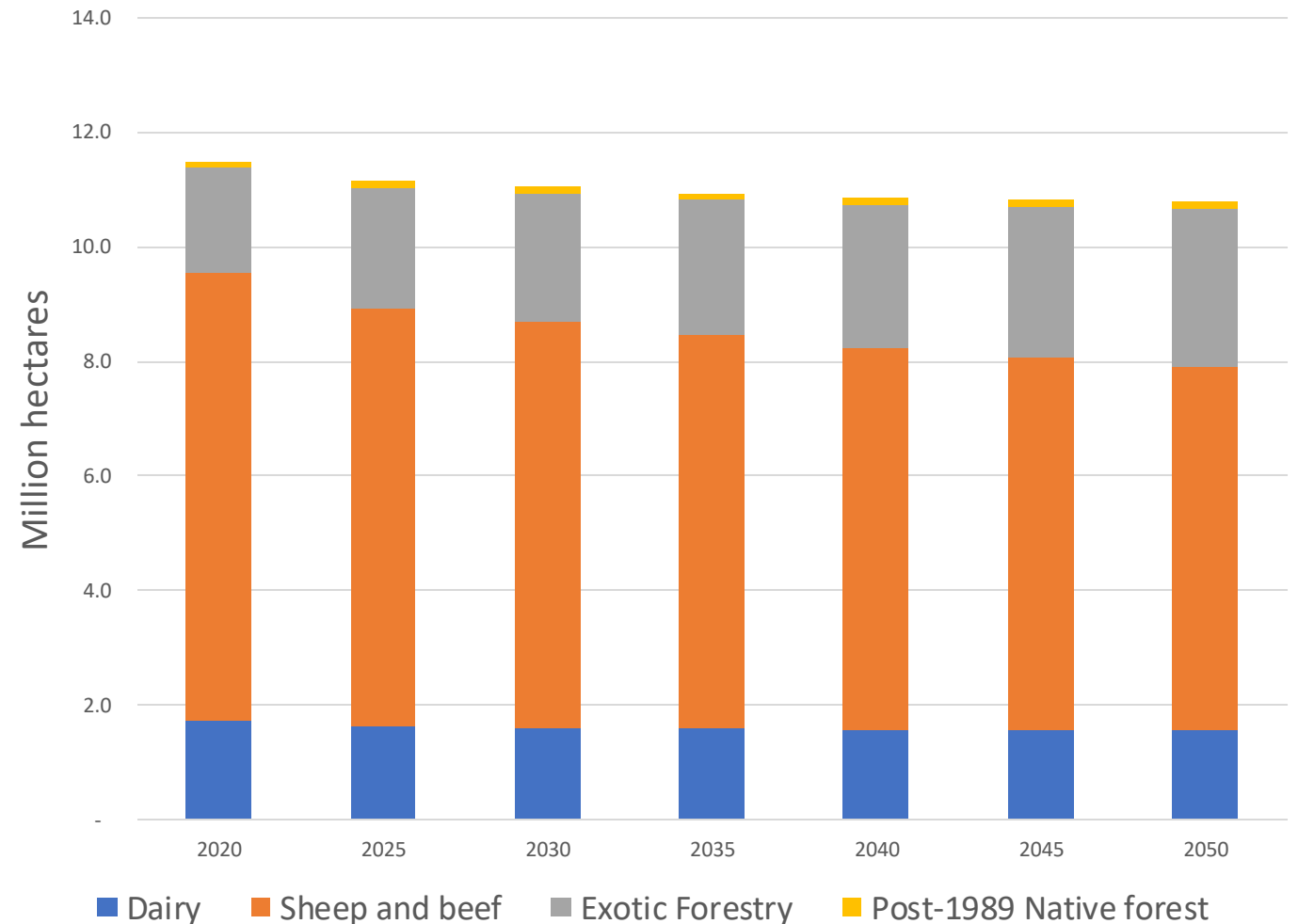
# There are many big forces at play

- There are many drivers that are resulting in increasing sequestration:
  - land prices / profitability of primary industries
  - log prices
  - Emissions Trading Scheme carbon price / central government policy settings
  - growth voluntary carbon market.
- Current Government policy is to rely more on tree planting to achieve emissions reduction targets
  - National forecasts predict land-use changes from sheep/beef farms to exotic forestry (may not be evenly geographically spread).
- In light of Government policy, **2025 city modelling predicts a significant increase in exotic forestry** over the years to 2030
  - This has little impact on city-wide sequestration levels initially due to the time lag between planting and forestry sequestering carbon

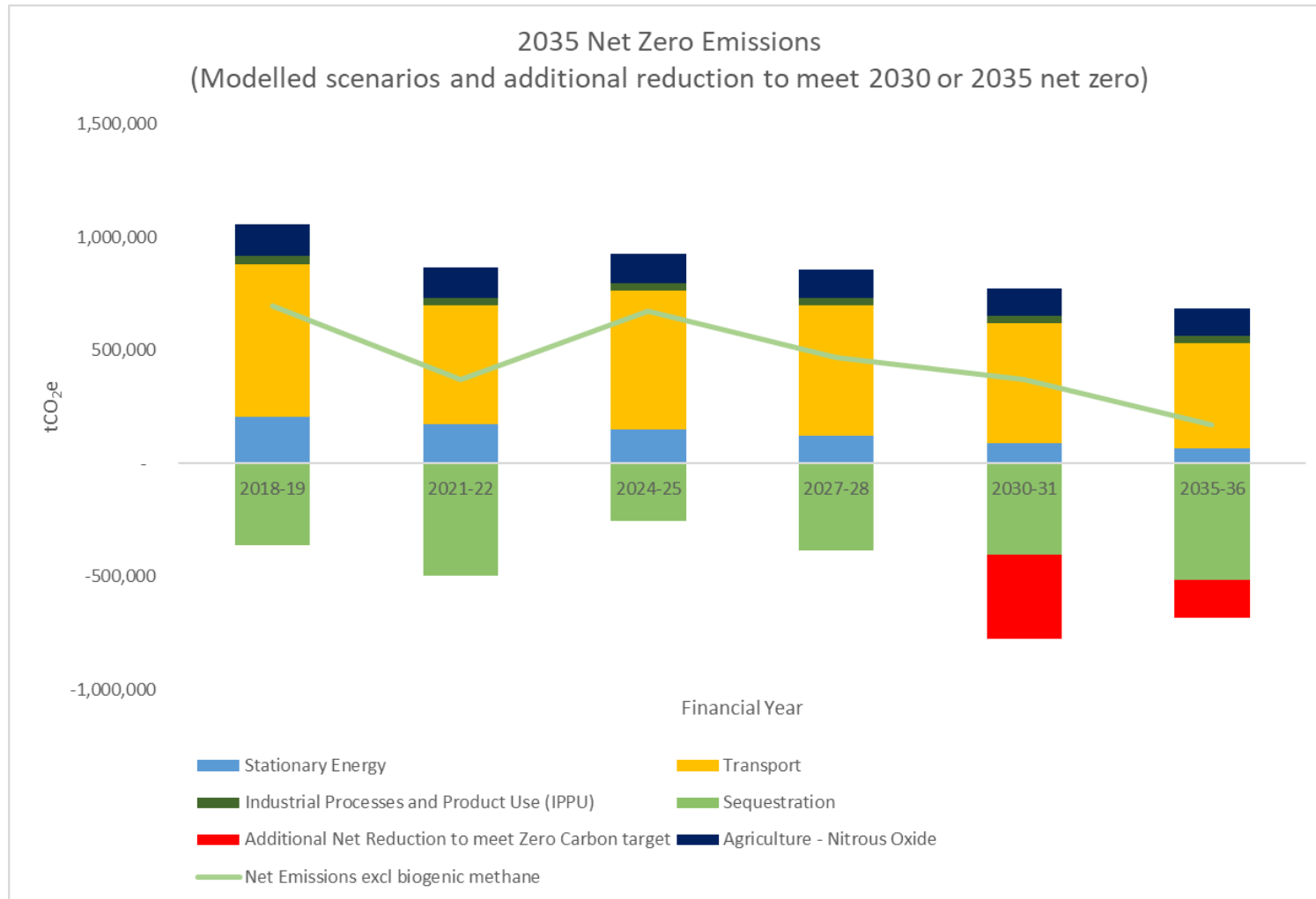
# Nationally, growth in forested land area is anticipated

## MfE modelling (ERP2):

- Sheep and beef farms are predicted to decrease from 7.8M ha in 2020, to 6.3M ha in 2050. Most is modelled to be converted to exotic forestry.
- Exotic forestry cover is predicted to increase from 1.8M ha in 2020, to 2.8M ha in 2050.



# Govt policy is reflected in Dunedin emissions modelling



Net emissions  
(accelerated  
ambition scenario)

**2030/31: 372,000tCO<sub>2</sub>e**

**2035/36: 170,000tCO<sub>2</sub>e**

- Note growth in  
sequestration.

- Additional reduction  
required to meet net zero  
is shown in red.

# There are two high-level approaches to carbon removals

- Difference is level of control.
- **Offsetting** – involves paying someone else to take action on your behalf, and you claim the credit for the emissions reduction.
  - At this point in time, offshore/voluntary markets offsetting is a rapidly changing landscape with associated risks
  - Closer-to-home options for the DCC may be less risky
  - DCC or collective would likely need to procure, vet, and contract

## KEY CONSIDERATION 4

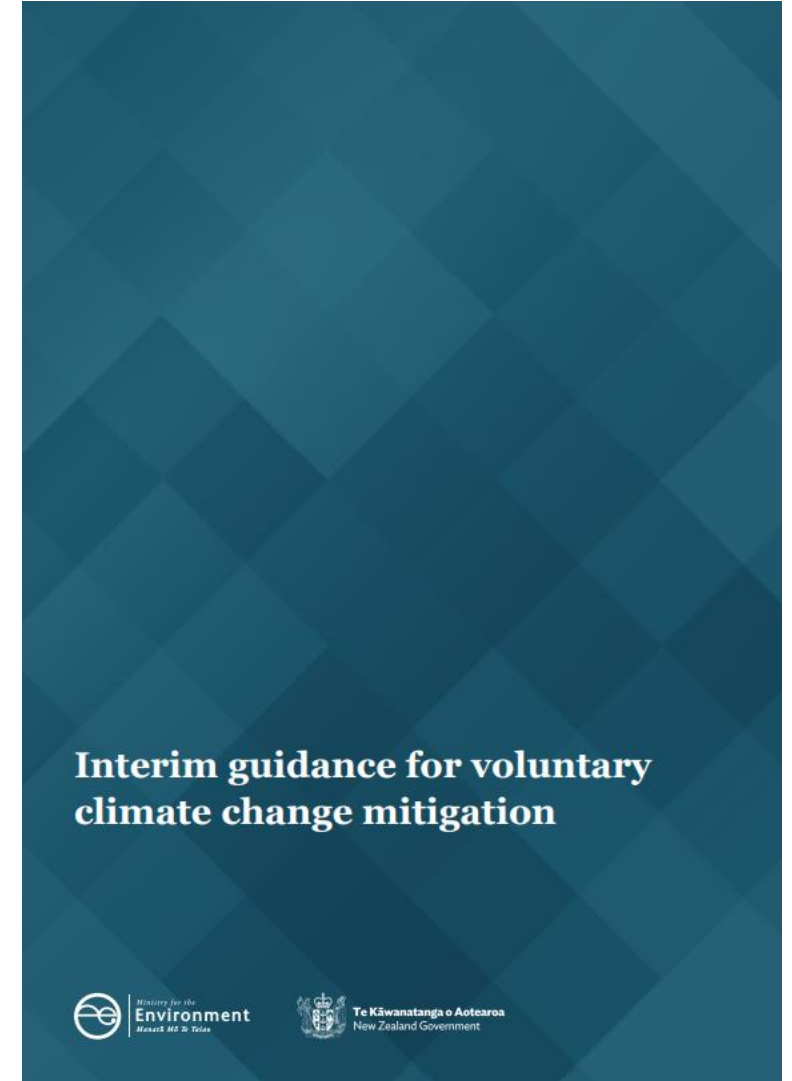
- **Sequestration (insetting)** – doing the action to absorb carbon dioxide yourself, often by trees or vegetation
  - Forests are the only type of sequestration in the ETS (measurable and verifiable).
  - Insetting with forests possible for DCC due to land ownership (especially where tree planting desirable for other reasons)
  - Many emerging methods (e.g. marine carbon, blue carbon (wetlands), and increasing soil carbon) are not currently easily measurable and verifiable
  - Government have indicated they will introduce legislation to add Carbon Capture, Utilisation and Storage (CCUS) to the ETS by the end of 2025; also some work underway around blue carbon.

# The carbon removals field is technical and evolving

- There are a range of technical considerations and accounting 'rules' for measuring carbon dioxide removals
- The DCC's Zero Carbon Policy states the **DCC will adhere to international best practice**
- Accounting rules differ at each scale. Removals that 'count' at one scale may or may not at another
- Science is also evolving, as more is learnt about sequestration and how it can be achieved and measured

# MfE guidance

- Carbon dioxide removal projects should only be undertaken after an organisation has measured emissions and committed to/acted on an emissions reductions plan
- For claims of voluntary carbon removals to be considered credible the action must:
  - be transparent, clearly stated, and publicly available
  - be real, measurable and verified
  - be additional to business-as-usual activity
  - not be double counted
  - not result in leakage of emissions elsewhere
  - be permanent.

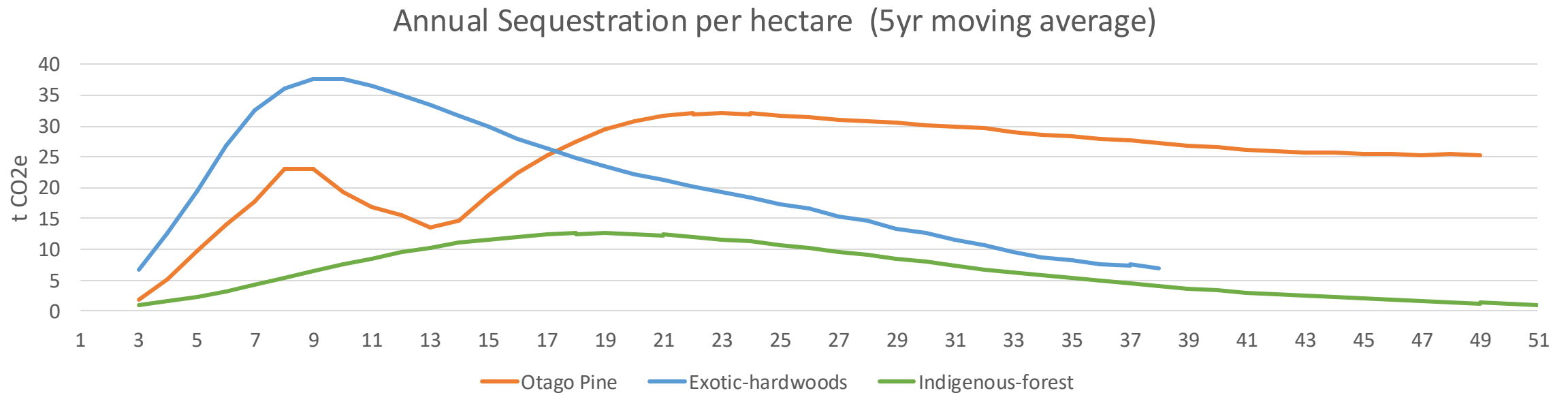


# Rules with notable policy implications

- **Location of DCC removals:** can be anywhere (but cannot be claimed by other organisations/schemes, e.g. ETS-registered forests)
- **Location of city removals:** must be in-district (all sequestration within city is counted in inventory, including ETS-registered forests)
- **Ability to measure with confidence and verify:** non-forest sequestration is harder to measure and verify as methodologies are not provided by MfE
- **Different forest types absorb carbon at different rates:** e.g. Pine vs natives
- **Risk and liability:** there are a number of risks to be aware of, including: reputational, physical / financial liability such as forest fires.

# Time lag and sequestration rates

- Trees take some time to start growing quickly enough to absorb lots of carbon. Some trees (e.g. pine) grow faster than others (e.g. native trees).



# A focus on co-benefits and partnerships is needed to achieve removals at any scale

- Balancing city emissions with in-district removals will exceed the DCC's capacity to resource on its own
  - Working with partners and stakeholders to design an approach that involves others' investment would unlock larger-scale sequestration opportunities
- Zero Carbon work programme guiding principles adopted by Council include **maximising co-benefits and considering value**. Removals need to be aligned with community values to be sustained.
  - Removals can be managed in a way that derives co-benefits e.g. for biodiversity, recreation or revenue
  - Removals can also affect other values e.g. expansion of forestry can impact on rural communities

# Mana whenua / community alignment

- Feedback from Aukaha:
  - Needs to be discussed with rūnaka to gauge level of interest/willingness to input
  - Before that can happen, need to see DCC commitment to this kaupapa in terms of LTP funding [this statement predates Council decision on 9 year plan]
  - Priority areas/catchments for sequestration will be able to be identified
  - Aspirations for involvement in funded carbon removal projects (incl. opportunities for rakatahi), particularly given need to transition out of Jobs 4 Nature projects
  - Thinking ahead, we should reserve a rūnaka seat(s) at the table in relation to this kaupapa
- Strong Zero Carbon Alliance interest, other stakeholders (e.g. farmers)
- DCC strategic framework (Te Ao Tūroa, PARS Strategy, Economic Devt)

# Indicative scale of theoretical removals\*

- The scale of planting required to meet a net zero 2030 city target (over and above the growth in forestry predicted by national level modelling) is unachievable.
- The scale required to meet net zero in 2035 is significantly lower, due to predicted reduction in gross emissions, and more time for the trees to grow and absorb carbon dioxide.
- However, the extent of land required is still very large. For context there are currently approx. 17,000 hectares of commercial exotic forests in Dunedin

Scenario	Predicted net emissions in 2035 (tCO <sub>2</sub> e)	Indigenous plantings to meet 2035 target (ha)	Exotic plantings to meet 2035 target (ha)
BAU	229,000	27,000	16,500
Accelerated Ambition	170,000	20,000	10,000

\* The calculations shown assume all planting occurs in 2025 – ***this is not a realistic scenario, and is provided to illustrate the significant land area required to meet a short-term net zero city position***

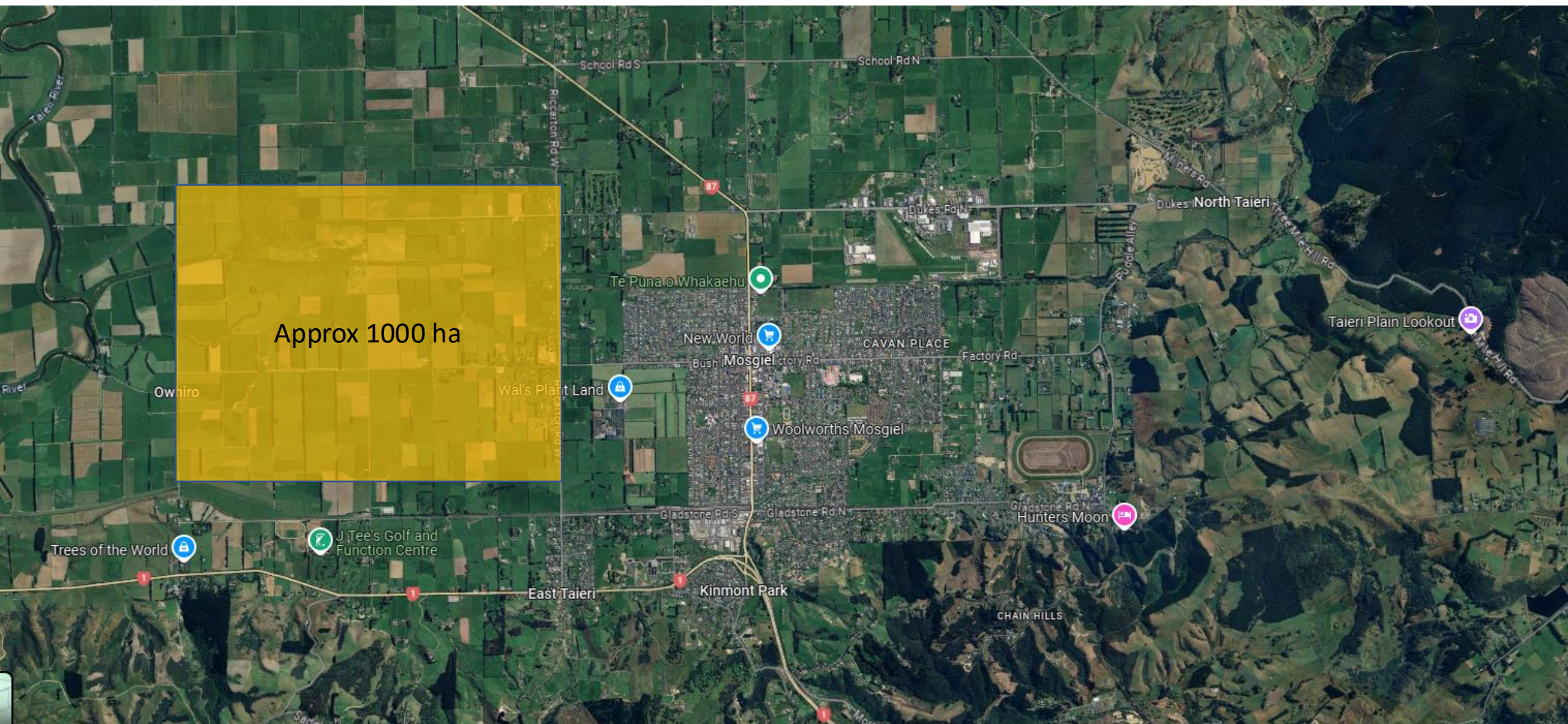
# Indicative scale of theoretical removals – DCC scale\*

- The scale of planting required to meet a balance residual DCC emissions target is significantly lower.
- The planting required to meet a 2035 target is significantly lower than to meet a 2030 target, due to the longer time available for trees to grow.
- After the target year DCC would become a “net negative” emissions organisation for decades, as the sequestration per annum continues to grow as trees mature.

Target year	Predicted DCC emissions (tCO <sub>2</sub> e)	Exotic hardwoods for DCC net zero (ha)	Indigenous for DCC net zero (ha)
2030	50,000	2,500	21,000
2035	40,000**	1,100	6,200

*\*\*DCC do not have a formal 2035 target. The “predicted DCC emissions” for 2035 assume DCC continues to reduce emissions 4.2% per annum, in line with SBTi guidance*

**\* The calculations shown assume all planting occurs over 3 years between 2025-2027 – *if Council wished to balance residual emissions, staff would need to determine whether such a planting schedule was feasible***



\* Map for scale – *location chosen at random to demonstrate scale only*



# C: Direction sought from Council

# What values are important, and what weighting should be placed on these?

- The work programme guiding principles suggest a focus on maximising benefits and considering value.
- In practice this would likely preference:
  - in-district removals
  - indigenous vegetation over forestry
  - enhancements to existing public land, and
  - opportunities to work with iwi, community groups or landowners

# How focused does Council wish to be on verification / claims?

- Investigating potential for verifiable removals would align most with best practice, even if this isn't something Council is concerned about formalising in the short term.
- While this will help to minimise risks of greenwashing, making 'net zero' claims is a multi-step and complex process, with evolving best practice, and it may ultimately add cost to implementation.

# What role for DCC in carbon removals?

## Within city

### Offsetting (private land)

- Targets DCC and Dunedin emissions
- Pay for planting of permanent or rotation forests (native, mixed/transitional, exotic)

### Support development of city carbon removals platform

- Targets Dunedin emissions
- Maximises third party revenue for in-district sequestration

### Incentivise removals on private land

- Targets Dunedin emissions
- Limited levers e.g. expanded grants, planning settings

### Insetting on DCC land

- Targets DCC and/or Dunedin emissions
- Plant permanent or rotation forests (native, mixed/transitional, exotic)
- Allow DCC land to regenerate
  - Re-wet/restore wetlands

### Planning/information function

- Targets Dunedin emissions
- Identifying sequestration opportunities, making information available

### Explore opportunities through DCHL

- Targets Dunedin emissions
- Provide direction with respect to forest estate/harvest cycles
- Other contributions (e.g. expertise)

## Outside city

### Offsetting

- Targets DCC emissions
- Pay for offsets on offshore/voluntary carbon market

Green and Blue Networks Plan

DCHL Carbon Roadmap

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- Strengths-based (DCC land, volunteer relationships)
- Strong alignment with other co-benefits/likely community support

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# Does Council want to invest in carbon removals?

- Best practice guidance is for gross emissions to be reduced as much as possible, before residual emissions are balanced by carbon removals
- **This would look like:** prioritising investment towards reducing gross emissions, and only investing substantially in sequestration once priority emissions reduction initiatives are fully funded (or funding both simultaneously)
- **Key decision points:**
  - Receipt of DCC EMRP (late 2025) – gross target does not emphasise DCC removals
  - Decisions on Dunedin target following receipt of target options report (early 2026) – continuation of a net zero target emphasises action to grow city removals
  - Decisions on 10 Year Plan 2027-37

# Singular target year or multi-year budget?

- The 2030 target is currently set up for a singular target year (2030). To achieve this, we would need to balance the GHG emitted in that one year with the GHG soaked up in that year. Commercial forestry cycles mean that the amount of sequestration can vary significantly year to year.
- A common approach is to use a multi-year budget approach e.g. the period between 2030 – 2035. New Zealand has a series of budget targets leading up to its 2050 net zero target. Council could choose to consider a similar approach.
- **Key decision points:**
  - Decisions on Dunedin target following receipt of target options report (early 2026) – continuation of a net zero target emphasises action to grow city removal



# D: Next steps

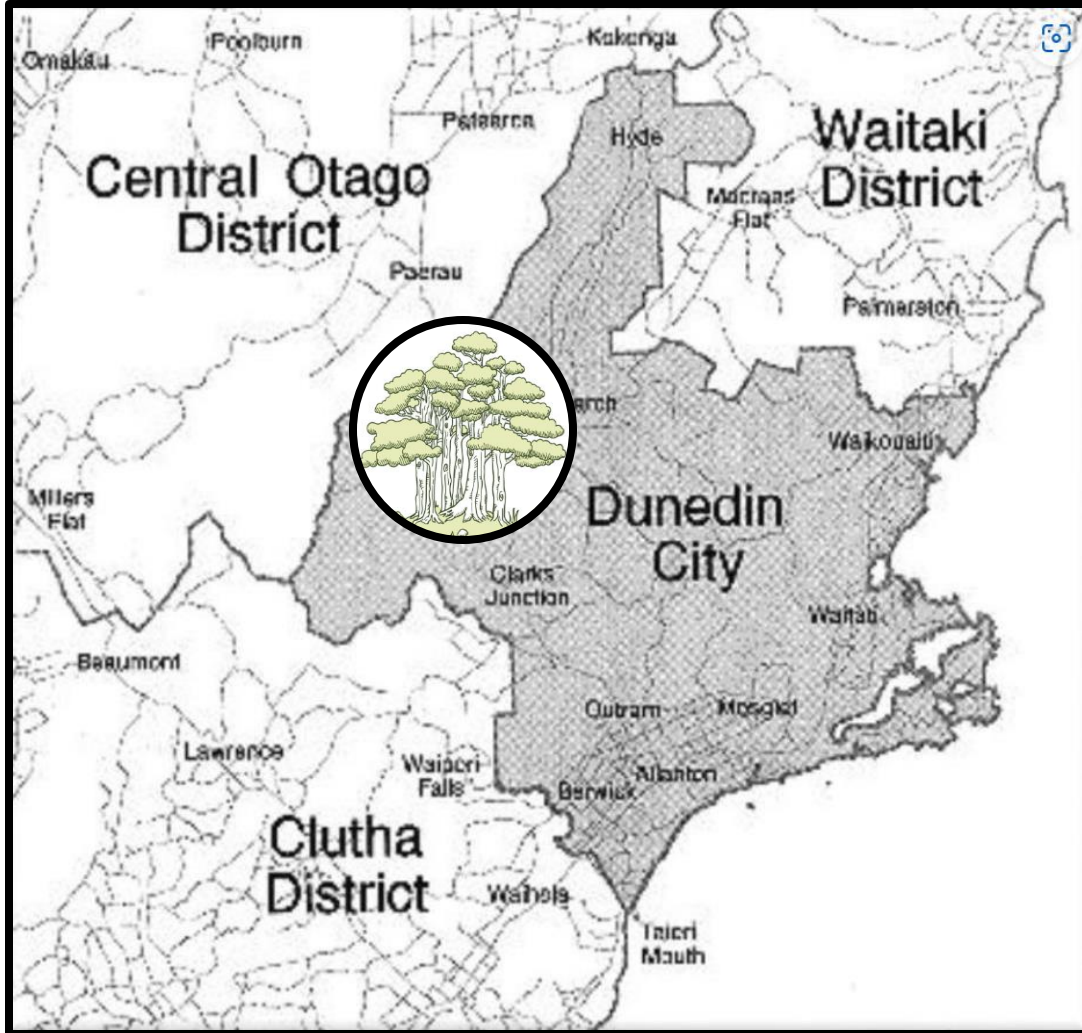
# Next steps

- Council report (June 24)
  - Will provide strategic direction for all DCC work on carbon removals
- Green & Blue Networks Plan to be developed (2025/26)
  - Will identify specific restoration and enhancement projects, including opportunities to sequester carbon on DCC land
- Zero Carbon Alliance scoping possible carbon removal collaboration (2025/26)
  - Early-stage discussions on potential collaborative projects, including a pilot site (led by another ZCA partner) and potential for a city carbon removals platform
- DCHL Carbon Roadmap is underway (DCHL lead on timeframes)
  - Will identify possible contributions to carbon removals alongside other potential contributions to emissions reduction



# Other supporting slides

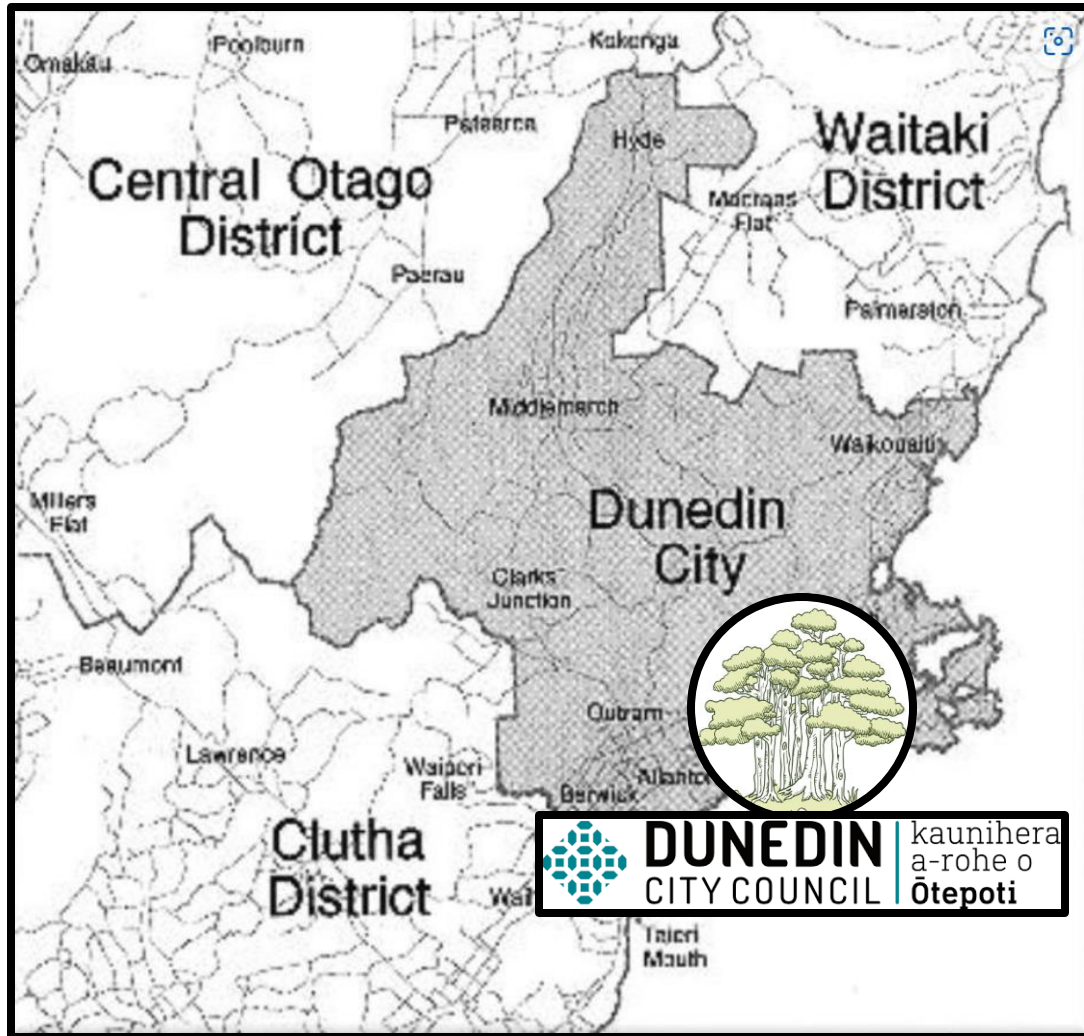
# Can it contribute?



- Private landowner extends planting on private land within Dunedin city
- Contributes to:

Dunedin scale	DCC scale	DCHL scale
Yes	No	No

# Can it contribute?

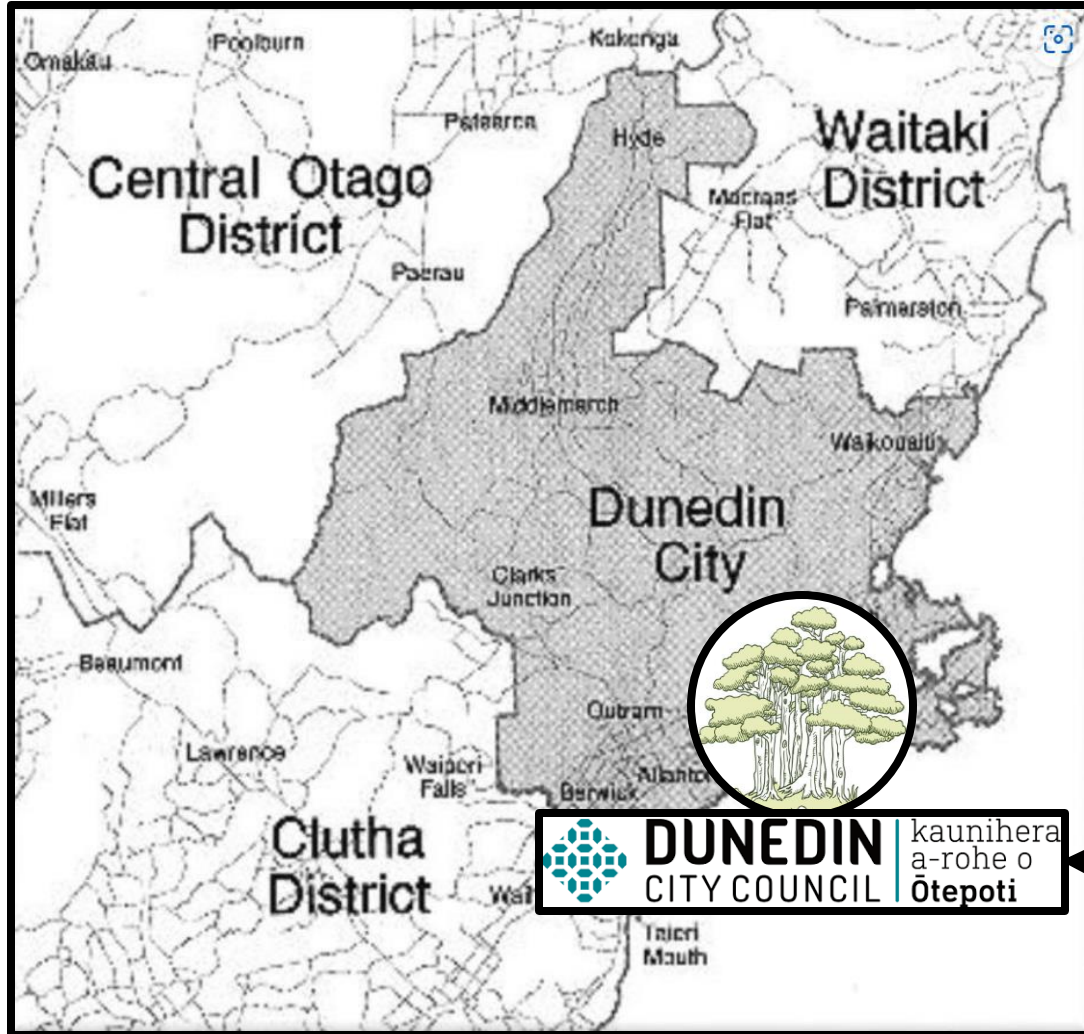


- DCC extends planting on DCC land within Dunedin city
- Contributes to:

Dunedin scale	DCC scale	DCHL scale
Yes	Maybe*	No

\* Verifying carbon offsets can be a resource-intensive exercise

# Can it contribute?



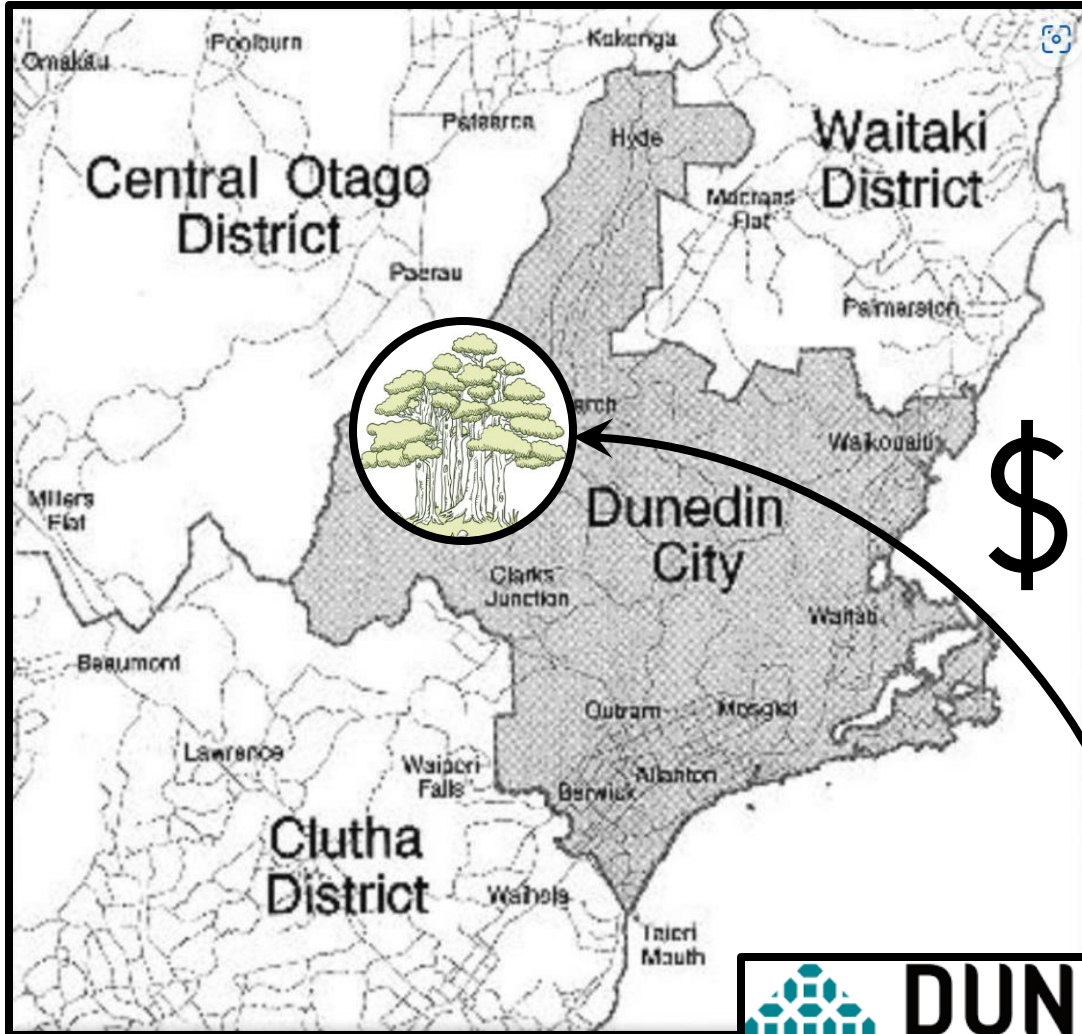
- Private company pays DCC to extend planting on DCC land within Dunedin city and secures carbon lease agreement or similar
- Contributes to:

Dunedin scale	DCC scale	DCHL scale
Yes	No	No

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Private company

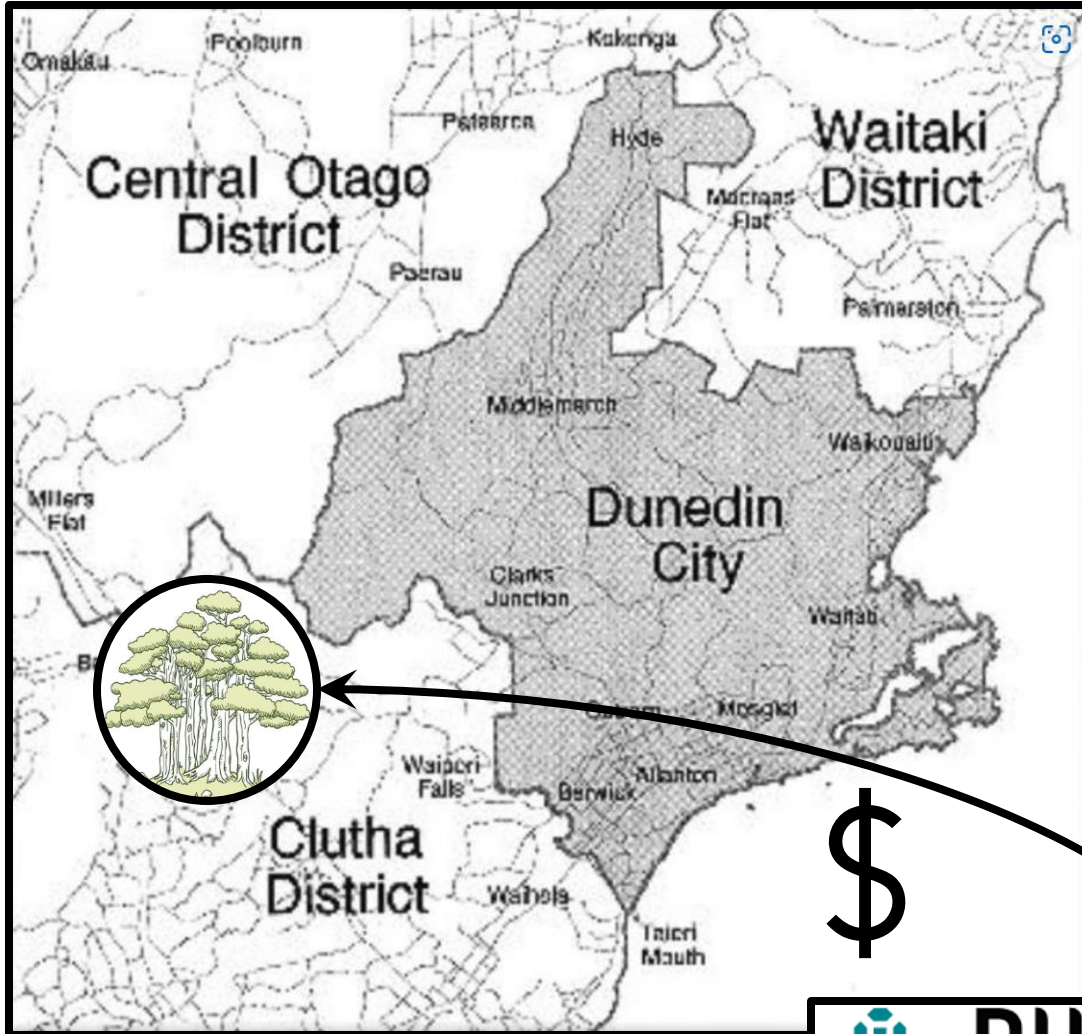
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Dunedin scale	DCC scale	DCHL scale
Yes	Yes	No

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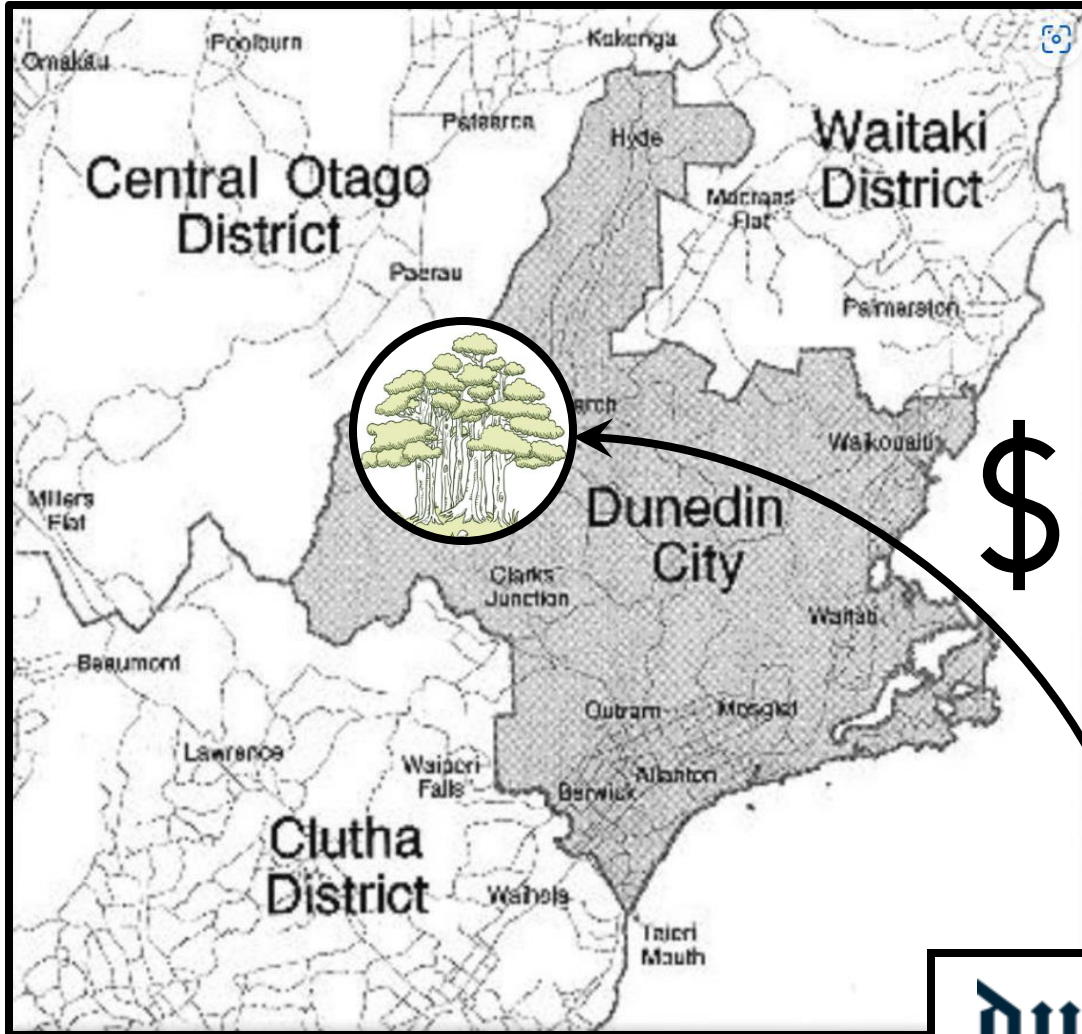


- DCC pays private landowner to extend planting on private land outside Dunedin city, and secures carbon lease agreement or similar
- Contributes to:

Dunedin scale	DCC scale	DCHL scale
No	Yes	No



# Can it contribute?

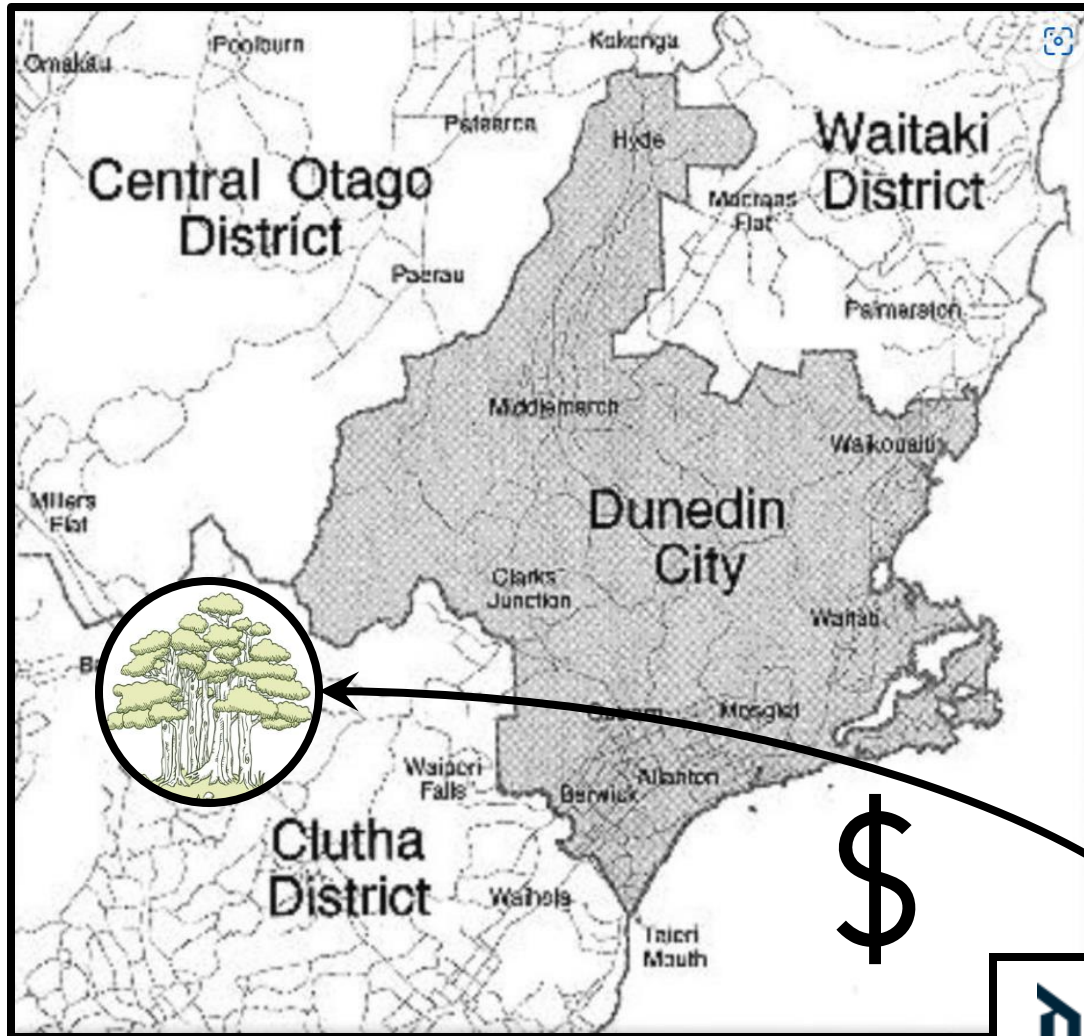


- DCHL company pays private landowner to extend planting on private land within Dunedin city, and secures carbon lease agreement or similar

Dunedin scale	DCC scale	DCHL scale
Yes	No	Yes

**dunedin**  
AIRPORT

# Can it contribute?

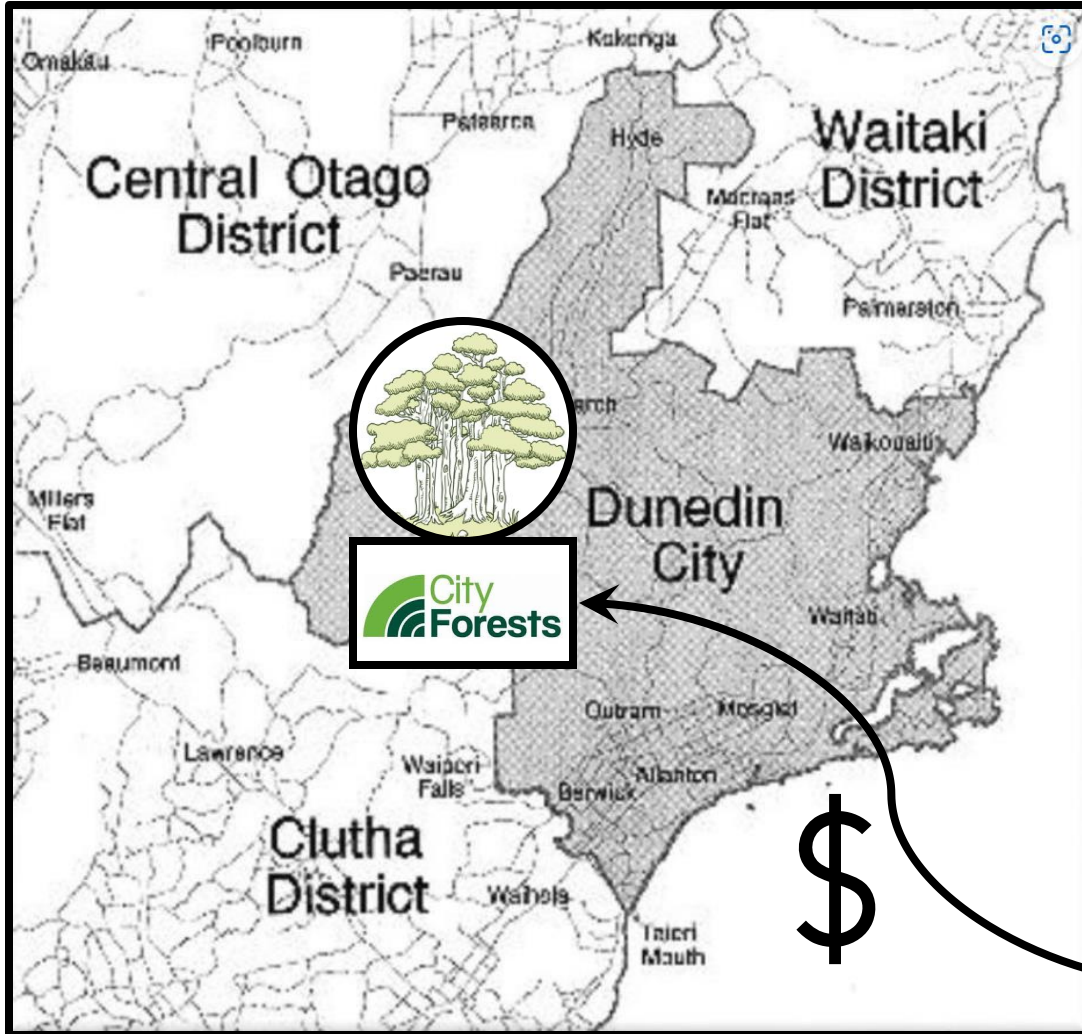


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**dunedin**  
AIRPORT

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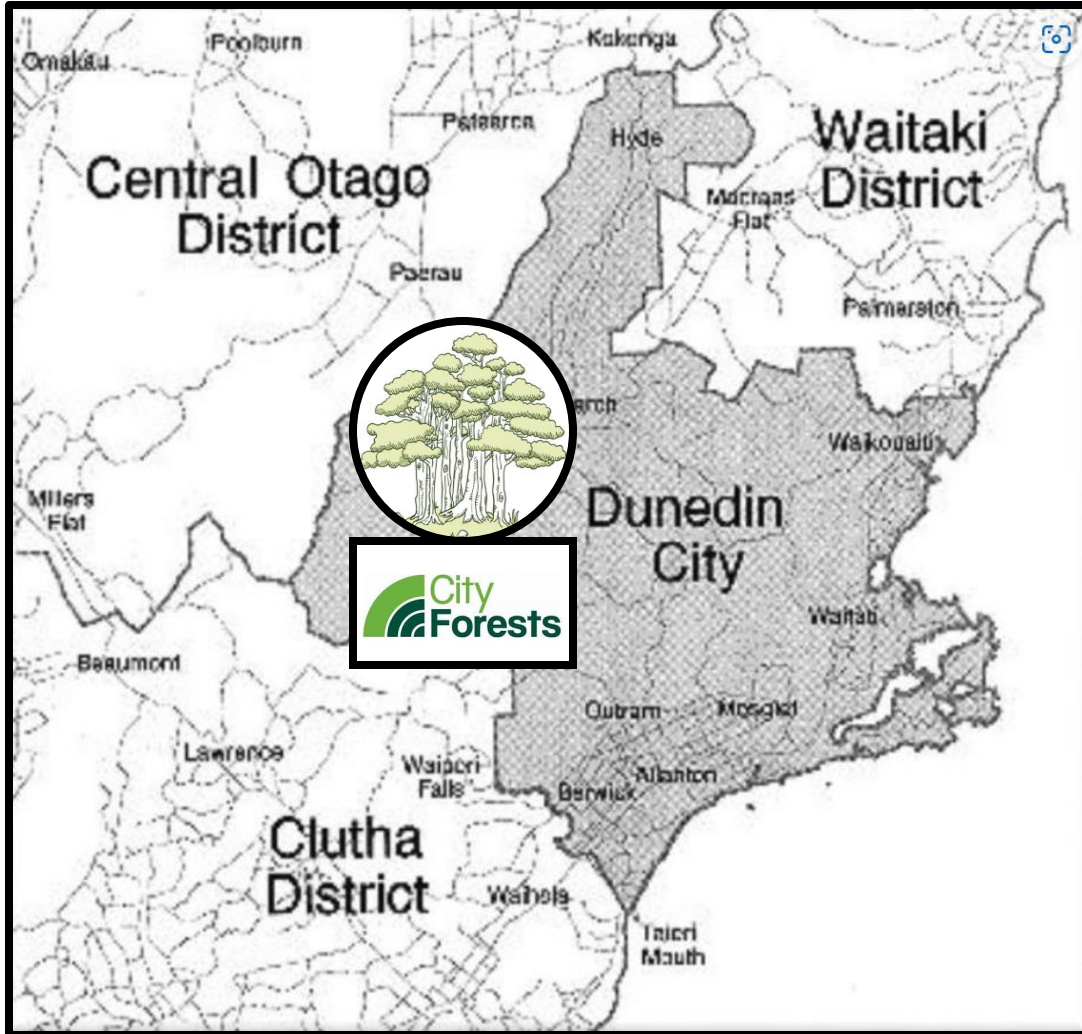


- City Forests extends planting within Dunedin city and registers in ETS
- Contributes to:

Dunedin scale	DCC scale	DCHL scale
Yes	No	No

Emissions Trading Scheme

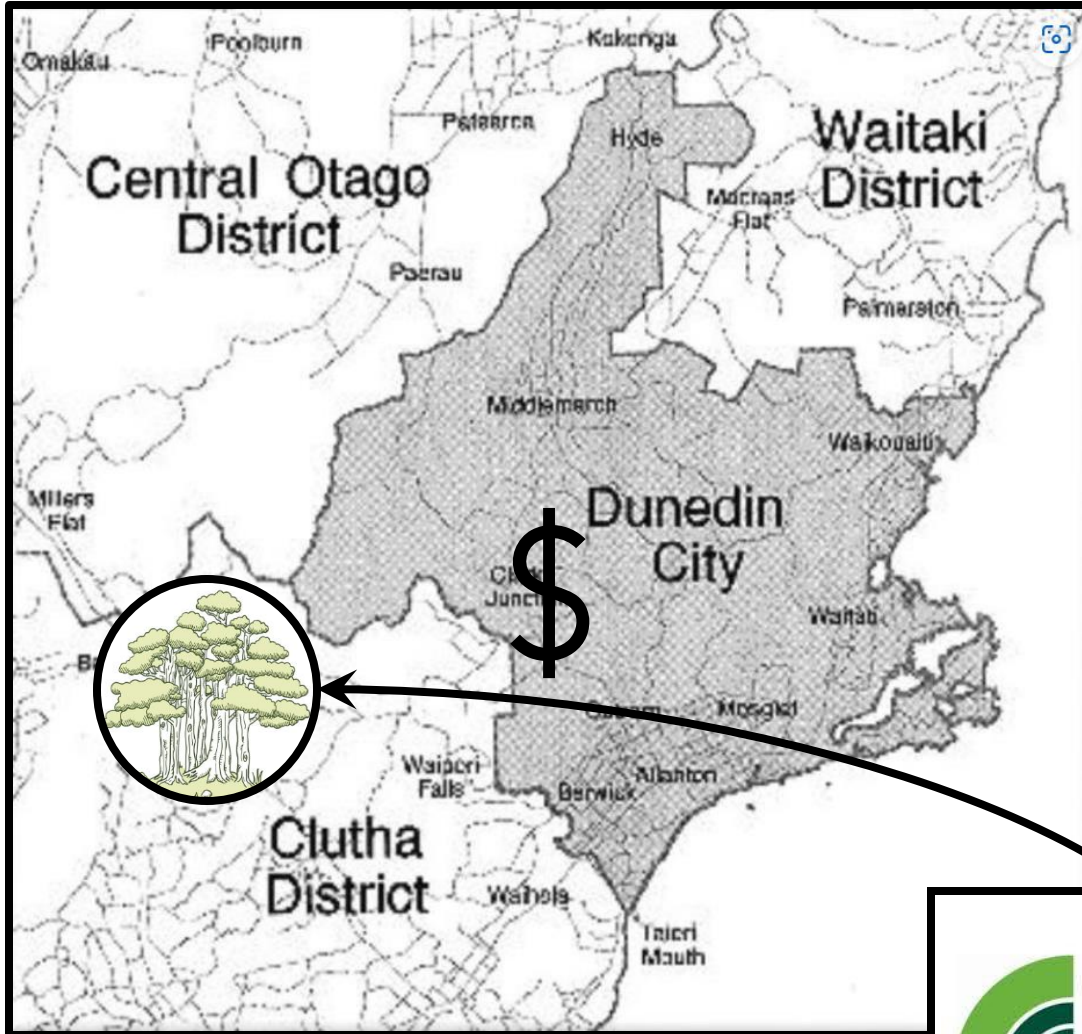
# Can it contribute?



- City Forests extends planting within Dunedin city and doesn't register in ETS
- Contributes to:

Dunedin scale	DCC scale	DCHL scale
Yes	No	Yes

# Can it contribute?

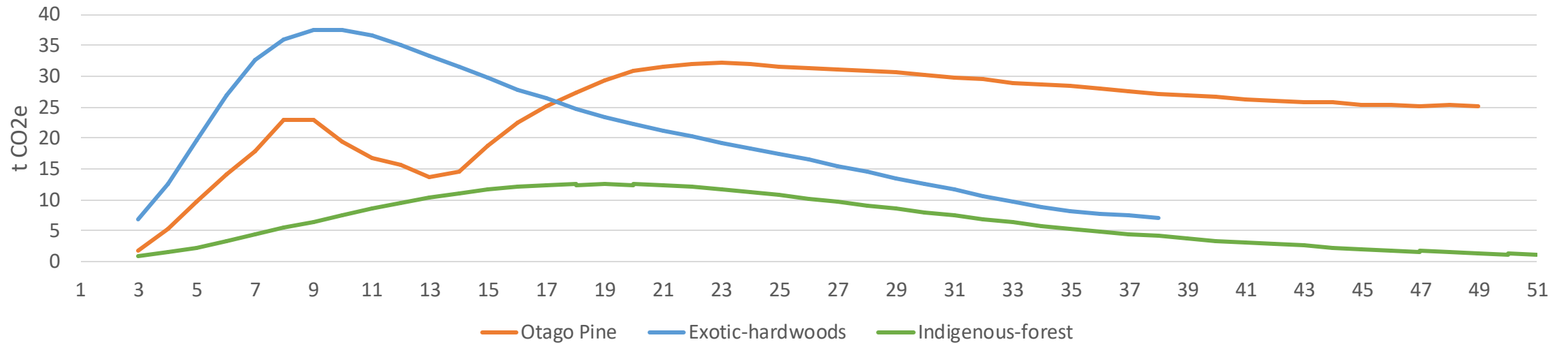


- City Forests extends commercial planting outside Dunedin city and registers in ETS
- Contributes to:

Dunedin scale	DCC scale	DCHL scale
No	No	No



Annual Sequestration per hectare (5yr moving average)



Total Carbon Stock per hectare

