16-02-2021

# Building well at pace and scale

**Patrick Dougherty**

**General Manager**
**Construction and Innovation**
**Kāinga Ora**

Kāinga Ora
Homes and Communities

## Kāinga Ora scale

- NZ's largest landlord 66,000 public homes
- Around 3,200 housing units contracted & under construction right now
- 11,000 units for public housing in the pipeline at various stages of the development process
- 21,000 people on the MSD housing register in September 2020
- 6 large scale regeneration projects underway
- Over 50,000 homes to be delivered within the large scale projects

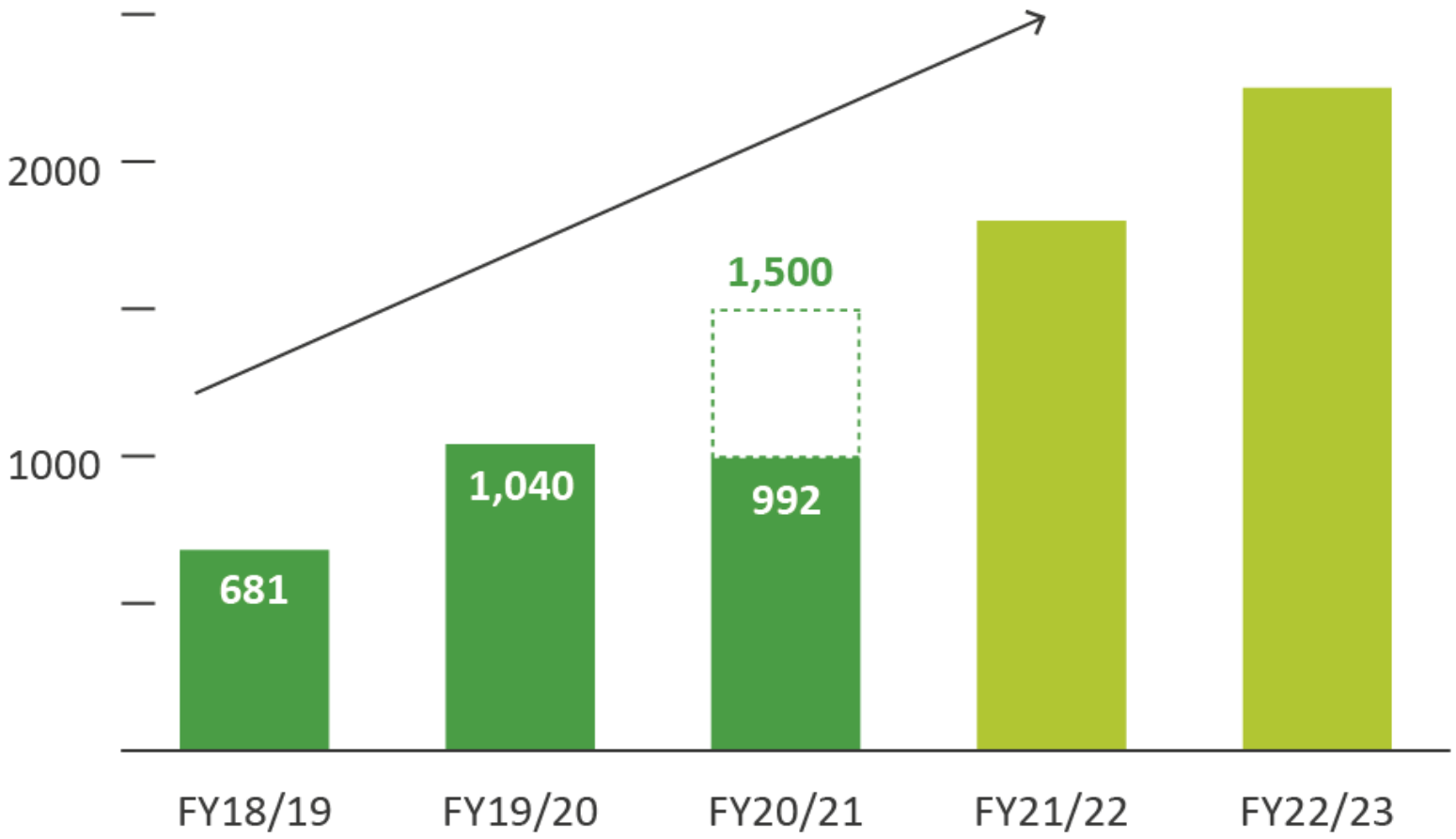
Kāinga Ora
Homes and Communities

## Four-year national housing programme

- 8,000 additional public homes - Kāinga Ora to deliver significant proportion
- Split between 6,000 public housing units & 2,000 transitional homes
- Kāinga Ora & community housing providers to deliver. With demo's & house replacements total build of around 8,000 homes
- 22,000 state homes rebuilt or retrofitted over next decade to improve thermal performance condition & functionality
- Average age of our houses will decrease from 45 to 33 years by 2027

Kāinga Ora
Homes and Communities

# Meeting growing demand + doing it better




- Speed of delivery
- Value for money
- Health and Safety

---

- Outcomes for Māori
- Community and social outcomes
- Quality design and wellbeing
- Environmental impact

---

- System transformation for NZ

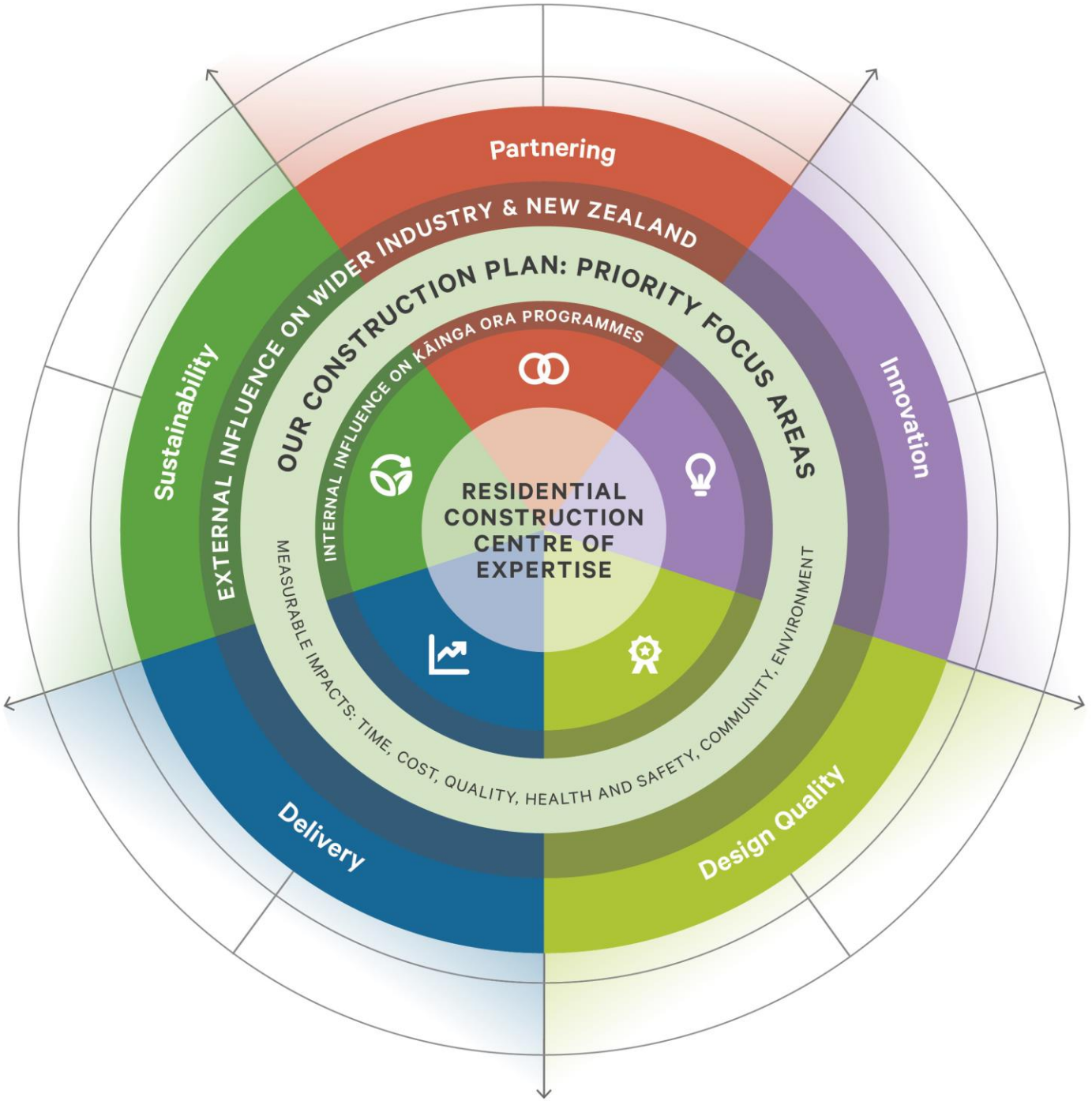
# Building Momentum - our construction plan for future homes

It's time to change. Housing more New Zealanders means we have to think differently to deliver quality state homes, at a faster rate, and with better outcomes for our customers, the communities in which we work, and the wider construction industry.

# Our 5 Priority Focus Areas

| | Our key activities: | What it looks like for us to mid-2021: |
|---|---|---|
| **Partnering** | **Expanding construction partnering agreements**<br>**Partnering with Māori** | ✓ CPAs for consultants<br>✓ A Maori partnering framework |
| **Innovation** | **Creating innovation programme + processes**<br>**Mainstreaming offsite + digital designs** | ✓ An OSM Stocktake + Plan<br>✓ CPAs for offsite / OSM suppliers |
| **Design Quality** | **Repeating standardised design components**<br>**Designing for whole-of-life** | ✓ Standardised Typology Suite (STS)<br>✓ Modular Design for Apartments |
| **Delivery** | **Sharing our forward growth programme**<br>**Consistent + streamlined programmes** | ✓ Pipeline: Forward Work Programme<br>✓ Lean Programme |
| **Sustainability** | **Reaching towards carbon neutral**<br>**Reducing waste in design + construction** | ✓ Carbon Neutral Housing Plan<br>✓ 3LW Sustainability Study |

# Our system




Kāinga Ora
Homes and Communities

## A Low Carbon Home = Warm, Dry, Healthy and Comfortable

### Priorities:

1. Improve occupant experience: comfort, health, wellbeing & reduce fuel poverty/energy hardship
2. Reduce operational energy use
3. Reduce embodied carbon impact of building materials including construction waste

- **Success Factors:** 1.5°C carbon budget per person, construction & life cycle costs/benefits, & monitoring the as-built performance of our homes

Kāinga Ora
Homes and Communities

## What is building ‘well’ in the context of carbon/sustainability and Kāinga Ora?

- Low carbon, warm, dry, healthy and comfortable state housing
- Ensuring communities are well connected & provide high quality living environments
- Maximising the experience of our customers in their homes & communities

## Building ‘well’ also a building quality issue:

- Ensuring onsite construction matches what was designed & constructed to the build quality expected
- Ensuring what is designed leads to benefits for our customers & environment

Kāinga Ora
Homes and Communities

# Kāinga Ora Sustainability Programme: Vision, objectives and benefits

**Vision**
Overall vision for the sustainability programme

Our activities contribute to and support the sustainment and enhancement of environmental wellbeing for future generations

**Capability objectives**
We cannot deliver this programme without enhanced capabilities

- People, culture and systems that enable us to be a leader in sustainability
- Working with our partners to deliver optimal results
- Supporting our customers, communities and people to live sustainably

**Delivery objectives**
Subcomponents of Kāinga Ora activity that will contribute to delivery of the overall vision

- Climate neutral homes
- Enhanced nature
- Efficient resource use
- Sustainable transport
- Climate resilient

**Interventions**
Activity that Kāinga Ora has committed to delivering through our urban development and construction programmes. These are expected to ensure we deliver sustainable homes and communities

- Carbon neutral construction
- Carbon neutral homes
- Community reforestation
- Native species protected
- Sustainable infrastructure
- Waste free housing development
- Optimised transport infrastructure
- Mode shift encouraged/ enabled
- Flood resilient housing and communities
- Heatwave resilient housing

**Primary benefits**
that we are aiming to achieve

- Housing climate impact minimised
- Nature protected or enhanced
- Waste and resource use minimised
- Transport climate impact minimised
- Climate event remediation costs avoided

Secondary benefits
that we expect delivery of this programme will contribute to

- Energy hardship reduced
- Mental health promoted
- Civil works cost reduced
- Physical health promoted
- Health risks minimised
- Warm, dry & comfortable housing
- Cultural connection promoted
- Increased connectivity
- Safer communities
- Community disruption minimised

Kāinga Ora
Homes and Communities

## Industry Transformation

- Industry leadership & vision = being informed client who knows what we want & how to get it done
- Promote culture change by helping  educate the industry
- Consider lifecycle costs & broader benefits in design & development decisions

***Develop and construct low carbon pilot projects:***

- Implement monitoring, measurement & reporting of as-built & operational energy
- Tracking energy use, carbon, occupant wellbeing to make evidence-based decisions

Kāinga Ora
Homes and Communities

# Cross-laminated timber (CLT)

- Around 15% of current build volumes is OSM
- 300+ completed homes using CLT as major structural element
- Fast, cost effective and safe to erect
- Investigating other uses of CLT via hybrid systems
- Evolving Wood First policy and Building for Climate Change important considerations

Kāinga Ora
Homes and Communities

## 5 Systems 3-Level Walk-Up Pilot

One site, 5 near identical buildings with 5 different structural &construction systems:

- Light timber frame
- Light gauge steel
- Precast concrete slab
- Cross-laminated timber
- Hybrid - to be determined

First Kāinga Ora building designs to undergo a lifecycle carbon assessment

Kāinga Ora
Homes and Communities

## Building well and at scale and pace

- R&D to gauge best mix of concrete, steel and timber to meet or exceed Building Code
- Design, construction & operation as ‘climate clean’ as possible
- Timber stud and concrete vs mass timber (specifically CLT): two of most commonly used primary structural building material
- By comparing these two we can start to illustrate indirect attributes of each

Kāinga Ora
Homes and Communities

**Construction & Innovation**
Patrick Dougherty
General Manager, Construction and Innovation
Patrick.dougherty@kaingaora.govt.nz

Kāinga Ora
Homes and Communities