MINISTRY OF BUSINESS, INNOVATION & EMPLOYMENT
HĪKINA WHAKATUTUKI

# COVERSHEET

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|---|---|---|---|
| **Minister** | Hon Barbara Edmonds<br>Hon Damian O'Connor | **Portfolio** | Economic Development<br>Agriculture |
| **Title of Cabinet paper** | Agritech Industry Transformation Plan: Approving the Horticulture Technology Catalyst | **Date to be published** | 19 July 2023 |

| **List of documents that have been proactively released** | | |
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| May 2023 | Agritech Industry Transformation Plan: Approving the Horticulture Technology Catalyst | Offices of the Ministers for Economic Development and Agriculture |
| May 2023 | Appendix One: Strategic and Operational Overview of the Horticulture Technology Catalyst | MBIE |
| February 2023 | Appendix Two: Horticulture Technology Catalyst Detailed Business Case | MBIE and MPI |
| 31 May 2023 | Agritech Industry Transformation Plan: Approving the Horticulture Technology Catalyst<br>DEV-23-MIN-0092 Minute | Cabinet Office |

**Information redacted** **YES / NO** *[select one]*

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Some information has been withheld for the reasons of confidentiality, commercial information, confidential advice to government, legal professional privilege, negotiations, and free and frank opinions.

**IN CONFIDENCE**

Office of the Minister of Agriculture
Office of the Minister for Economic Development

Cabinet Economic Development Committee

# Agritech Industry Transformation Plan: Approving the Horticulture Technology Catalyst

## Proposal

1 This paper seeks Cabinet's approval of the detailed business case to establish a Horticulture Technology Catalyst. This detailed business case has been developed as a high-impact project under the Agritech Industry Transformation Plan. Funding has been approved through Budget 2023.

## Issue Identification

2 Horticulture across the world is growing due to increased demand – for example, New Zealand's horticulture sector had, before the impact of Cyclone Gabrielle, set a goal of doubling its revenues to $12 billion by 2035. As horticulture grows, it faces challenges such as labour availability, adaptation to and mitigation of climate change, and strengthening consumer preferences for safe food and traceability requirements for these preferences. These challenges require innovative solutions, fuelling international demand for horticulture technology. Cyclone Gabrielle has simply highlighted the critical need for solutions that will increase the horticulture sector's recovery and resilience.

3 There are pockets of excellence in the New Zealand horticulture technology sector, but the sector suffers from fragmentation, duplication, skills shortages, and suboptimal commercialisation due to lack of connections across the sector and internationally. The Horticulture Technology Catalyst will help to address challenges to seize the potential for a high-value horticulture technology sector in New Zealand.

## Relation to government priorities

4 The Horticulture Technology Catalyst is a key initiative under the Agritech Industry Transformation Plan (ITP). ITPs are a key initiative under the Government's Economic Plan, aiming to unleashing business potential by working with industry to improve productivity, diversification, and resilience. The Agritech ITP aligns with and supports other priorities including the Fit for a Better World roadmap, the Emissions Reduction Plan (ERP), Te Ara Paerangi and the Māori Economic Resilience Strategy.

## Executive Summary

5 In July 2020, Cabinet approved the launch of the Agritech ITP [DEV-20-MIN-0110]. Exploring the establishment of a Horticulture Technology Catalyst (the Catalyst) is a proposed high impact project under the Agritech ITP. The Catalyst aims to develop New Zealand's horticulture technology sector to a high-growth, innovative industry cluster by increasing the sector's international focus, growing industry talent, and increasing collaboration and connections across the horticulture sector.

6 The Agritech ITP has been refreshed through 2022. In December 2022, Cabinet considered and approved a refreshed ITP for public consultation, which closed in April 2023 [DEV-22-MIN-0295 refers]. Progressing the Catalyst remains a high priority under the Agritech ITP and funding for its delivery was sought and has been approved through Budget 2023.

7 In April 2022, the Cabinet Economic Development Committee (DEV) endorsed the indicative business case for the Horticulture Technology Catalyst and directed officials to develop a detailed business case [DEV-22-MIN-0083 refers].

8 Since the endorsement of the indicative business case, refinements have been made to the Catalyst's proposed delivery arrangements, costings, proposed service scope, and structure, which will ensure successful delivery. **Appendix One** provides a two-page summary strategic and operational overview of the Catalyst. **Appendix Two** provides the full detailed business case.

9 The Catalyst has three proposed core service areas, which have been refined and prioritised based on a series of pilot activities, and in consultation with an industry reference group representing horticulture organisations, horticulture technology firms, research institutes and government.

9.1 **Industry Connector:** The Catalyst will create a central knowledge hub of global and domestic horticulture technology industry intelligence and innovation insights, provide thought leadership and connect firms to global and domestic opportunities. This will include personnel, digital tools and data on international market opportunities, sizes, and gaps to support and engage firms.

9.2 **Industry Talent Development:** The Catalyst will work with relevant parts of the education system (including three of the six workforce development councils), and industry to facilitate a pipeline of 'industry-ready' workers. This will aim to better tailor education provision to the industry's needs, while also ensuring industry takes a long-term view ensuring that skills development across the ecosystem is a priority.

9.3 **Project Facilitation:** Building on the Industry Connector, the Catalyst will bring parties together and provide leadership and support services to enable projects to reach commercialisation critical mass. This could

be in the form of project facilitation and/or leadership coaching, access to intellectual property (IP) commercialisation advice, business, and financial modelling support, and showcasing opportunities.

10 The Catalyst will contribute to the Government's Economic Plan of developing a high-wage and low-emissions economy that provides security in good times and bad by accelerating the growth of a high-potential and innovative sector of the economy, which will diversify our exports while strengthening our horticulture sector's resilience. An economic impact assessment from Deloitte predicts that by 2035, the Catalyst could increase New Zealand's GDP by approximately $141.0 to $347.1 million in present value terms.

11 Cabinet approval of the detailed business case is required as formal endorsement to implement the Catalyst with the three proposed core service areas.

12 We consider the Catalyst represents a significant opportunity and recommend that Cabinet approve its detailed business case. Cabinet approval will trigger implementation arrangements to establish the Catalyst operating model, resources, baseline insights, scoping of services and funding arrangements. Joint Ministers will take necessary decisions during implementation and establishment of the Catalyst, consulting with other relevant Ministers as appropriate.

## Background

13 The Agritech ITP, first launched in July 2020, included an action to explore the development of a Horticulture Technology Catalyst. This action aimed to seize on the strategic opportunity presented by the increased global demand for horticulture technology solutions by growing New Zealand's high-potential horticulture technology sector. The Agritech ITP was refreshed over 2022 to build on existing successes and explore new priorities and the Catalyst remains as a key priority under the ITP [DEV-22-MIN-0295 refers].

14 The ITP is partnership-based, co-led with industry body AgriTech New Zealand (AgriTechNZ). The Ministry of Business, Innovation and Employment (MBIE) and the Ministry for Primary Industries (MPI) are the ITP's co-lead agencies, with New Zealand Trade and Enterprise (NZTE), and Callaghan Innovation partnering in the implementation of the ITP's actions.

15 In April 2022, Cabinet endorsed an indicative business case for the Catalyst and directed officials to develop a detailed business case [DEV-22-MIN-0083]. This paper presents the Catalyst's subsequent detailed business case as **Appendix Two**, with a two-page summary overview presented in **Appendix One**.

## Horticulture technology has significant growth potential for New Zealand

*Horticulture globally faces significant challenges that require innovation*

16 Horticulture across the world is growing due to increased demand – for example, New Zealand's horticulture sector had, before the impact of Cyclone Gabrielle, set a goal of doubling its revenues to $12 billion by 2035. As horticulture grows, it faces challenges such as labour availability, adaptation to and mitigation of climate change, and strengthening consumer preferences for safe food and traceability requirements for these preferences. These challenges require innovative solutions, fuelling international demand for horticulture technology. Cyclone Gabrielle has shown the critical need for solutions that will increase the horticulture sector's recovery and resilience.

17 There are pockets of excellence in the New Zealand horticulture technology sector, but the sector suffers from fragmentation, duplication, skills shortages, and suboptimal commercialisation due to lack of connections across the sector and internationally. The Catalyst will help to address challenges to seize the potential for a high-value horticulture technology sector in New Zealand.

*New Zealand's horticulture technology sector must look overseas for success*

18 New Zealand's horticulture technology sector is mostly comprised of relatively small firms, with a few large and internationally successful firms. This indicates that firms in the sector can succeed in growing to a large, exporting stage, given the right conditions.

19 Firms in the horticulture technology sector have a relatively small (compared to international markets) and fragmented pool of customers in our horticulture industry. There are therefore few opportunities for horticulture technology firms to achieve significant domestic scale.

20 New Zealand's horticulture technology sector therefore needs international markets for the appropriate level of opportunity to scale up. International connections and partnerships can provide the sector with the critical mass to become a successful and self-sustaining sector. An international outlook is a hallmark of globally successful agritech sectors.

21 New Zealand is counter-seasonal to the northern hemisphere, including countries with leading agritech sectors, such as the Netherlands, Israel, and Singapore. This presents an opportunity for New Zealand to be a test bed for horticulture technology firms to accelerate research and commercialisation of technology through international collaboration.

**The detailed business case lays out a clear and optimised operational model for the Catalyst, comprising three core service areas**

22 The services have been developed in consultation with industry and have been piloted. Together these services aim to connect a fragmented sector to build growth and momentum. Each service is set out below.

*Industry Connector*

23 The *Industry Connector* is the Catalyst's core aspect. It aims to bring together the pockets of excellence in New Zealand's horticulture technology sector and connect these to the strong international interest and opportunities that will drive investment and growth in the sector. This will enable stronger collaboration and connectivity across the industry, and provide awareness of innovative solutions, while helping to match needs with solutions.

24 The Industry Connector will run targeted industry events specific to the horticulture sector to build the horticulture technology community and provide access to networks of early adopters of horticulture technology to support testing and piloting, in addition to leveraging other technologies. The connector function will also develop and leverage online tools (such as a funding navigator and industry directory).

*Industry Talent Development*

25 The *Industry Talent Development* service aims to address the sector's constrained skills and talent pipeline. The Catalyst will work with educators and industry to facilitate a pipeline of 'industry-ready' workers. To achieve this it will, for example, work with the industry to facilitate secondment opportunities and work with higher education and tertiary institutes to guide students into horticulture technology opportunities, both on- and off-orchard, potentially through commercialisation trials when available. Capability programmes and business training, relating to topics such as technology relevant to growers or basic business hygiene support, will be designed and prioritised during the establishment phase, with a strong working interface with three of the six Work Development Councils: Muka Tangata (People Food and Fibre), Toi Whanui (enabling technologies) and Toitu Te Waiora (Community, Health and Social Services).

*Project Facilitation*

26 The Project Facilitation service aims to facilitate partnerships – through introductions, advice, and project support – to break down barriers to commercialising innovation and technology and enhancing the maturity of the industry, and to make it easier for industry participants to navigate technological challenges and the web of funding and assistance available. This could be in the form of project facilitation and/or leadership coaching, access to intellectual property (IP) commercialisation advice, business and financial modelling support, and showcasing opportunities.

27 Strategically, these services aim to build momentum for a ‘flywheel effect’ in the sector, where activity and successful projects in the sector create more activity and galvanise the sector’s growth. This model ensures a lower cost and a higher degree of flexibility and central leadership. It builds on the current approach of the Agritech ITP’s delivery while incorporating lessons learned. It further avoids possible impacts to the Catalyst from changes to the shape of the research, science, and innovation system by Te Ara Paerangi – Future Pathways.

28 Callaghan Innovation and NZTE have been piloting activities in collaboration with wider Agritech ITP initiatives. These pilots have provided some valuable lessons for the Catalyst and a basis to develop a focused and bespoke service offering for the Catalyst. For example, industry feedback has emphasised that community-building (such as through industry events that have been piloted under the ITP) and supporting international immersions for firms are of particular value. The business case reflects this feedback and prioritises these service delivery areas.

29 The Catalyst seeks to purchase these services, managed by the core Catalyst delivery team to include a Catalyst Director, Programme Manager and Contract Managers. The scale of collective contracted services is based on an assumed resource proxy – that is, the equivalent number of FTEs (both existing and new) needed to provide sufficient resourcing to deliver a service in its entirety.

30 Confidentiality, Negotiations

*We consider baselined funding from Government for the Catalyst will best ensure its success*

31 The business case notes total funding required to deliver the Catalyst is currently estimated at $29.9 million over four years (starting in July 2023), with baselined funding of $8.15 million per outyear for ongoing operations. A Budget 23 bid was submitted and has been approved to provide both establishment and ongoing funding for the Catalyst.

32 Baselined funding is recommended to signal the initiative’s stability and commitment to transform the industry. There has been acknowledgment throughout the development of the Indicative and Detailed Business Cases, regarding the role of industry investment for the future of the Catalyst. Recent examples have also been noted, where time limited funding has been applied, before true sector shifts and transformation is realised. This is particularly relevant in the case of Horticulture Technology, an emerging, niche and

fragmented industry cluster where transformation will take a longer period of time, in comparison to highly mature and innovative sectors and ITP's.

33 International experience shows that building industry clusters, such as the Catalyst aims to do, requires a long-term view and commitment. Without this certainty of funding, there is a risk industry would not buy into the initiative. The expectation of user fees and contributions from the outset, would erode industry confidence and engagement in the programme, noting the nascent and early life stages of many of these companies

34 The detailed business case proposes that funding for the Catalyst is to be provided by government, rather than including contributions from industry. This is to ensure that the initiative is equitably designed for the entirety of the sector. A review point in four years would be recommended to test outcomes and assess other factors or opportunities that may influence the structure of this baselined funding to include co-funding and/or user contributions. With a contract driven service model, the catalyst retains flexibility to shift or exit resource.

*The Catalyst strikes a balance between impact, cost, and delivery success*

35 The indicative business case recommended several options with Option B being the preferred option, which Cabinet endorsed in April 2022. These options are outlined below, along with indicative costings:[1]

35.1 Option A – Catalyst Light: only provides the Industry Connector service outlined in paragraph 21-22 and would be delivered virtually Confidentiality

35.2 Option B – Targeted Services **(endorsed and preferred option)**: provides the three services outlined above in paragraphs 21-24 for the horticulture technology sector. Per Option A, this would focus on the horticulture technology sector and would be delivered virtually. ($29.9 million over four years and $8.15 million per outyear).

35.3 Option C – Catalyst Plus: builds on Option B with a purpose-built physical facility as a central hub and goes a step further by being involved in commercialisation and education activities and holding IP Confidentiality

36 Confidentiality Option B was therefore considered to optimise public value for the Catalyst as it met investment objectives while delivering the desired benefits. Confidentiality Noting that the sector is regionally and geographically dispersed, Option B's virtual delivery allows for flexibility and responsiveness to sector needs.

[1] Note that costings for Option B are considered reliable as it was the business case's preferred option. Confidentiality

*The Catalyst's organisational model ensures flexible and responsive service with minimal overheads, and has been endorsed by industry*

Confidentiality, Negotiations

40 This model of delivery ensures low overhead costs for the Catalyst (e.g. through capital outlays, minimal support staff, and by tapping into existing organisational structures). The detailed business case's Industry Reference Group endorsed this approach, noting its benefits in flexibility and reduced cost that mean the Catalyst's funding will be used for services that benefit industry.

Confidentiality, Free and frank opinions

**We recommend approving the Catalyst's detailed business case**

42 The Catalyst could provide significant growth in the horticulture technology sector, as well as the broader agritech sector (e.g. through spill over benefits). Its tight focus aligns well with the Productivity Commission's recommendations under the Frontier Firms inquiry, focusing investment on an area of existing and emerging economic strength and competitive advantage.

Further, it could be a transformative tool to help achieve *Fit for a Better World* targets by:

42.1 Increasing labour productivity and exports of horticulture technology and horticultural products, as substantiated by the economic impact assessment; and

42.2 Increasing the number of jobs in the horticulture sector while enabling the sector to be less reliant on low-skilled, seasonal migratory work as technology is adopted and shifts needed employment to higher-skilled, higher-paid jobs.

43 The business case includes an economic impact assessment to provide a clear view of its potential benefits. This assessment predicts that by 2035, the Catalyst could increase New Zealand's GDP by approximately $141.0 to $347.1 million in present value terms (discounted at 6% per year).[2]

44 Overall, the Catalyst's detailed business case provides a strong proposition that delivers to Government's priorities across the Economic Development and Agriculture portfolios, in turn contributing to our shift to a high-wage, low-emissions economy that provides security in good times and bad.

45 We therefore recommend Cabinet approve this detailed business case.

**Population Implications**

46 The Catalyst is likely to benefit regional and rural populations positively, as this is where horticulture technology firms are found and where the horticulture sector is concentrated.

47 The primary industries make a significant contribution to the Māori economy, with the importance of horticulture increasing particularly in recent years.[3] Throughout the development of the business case and design of the Catalyst, the ITP's Māori Advisory Group has provided valuable te ao Māori insights on the needs and future shape of horticulture technology.

48 Horticulture is a rapidly growing share of the Māori economy, and there are opportunities for the Catalyst to contribute to enabling and expanding Māori/iwi horticultural operations, and to create clearer pathways for Māori talent development.

49 Developing a strong horticulture technology sector in New Zealand may have an impact on the makeup of our horticulture sector. If the horticulture sector's

[2] This impact is based on predicted additional exports of horticulture technology and conservative estimates of increased productivity in horticulture through use of horticulture technology. These predictions were based on MBIE and Callaghan Innovation's understanding of the current size and profile of the horticulture technology sector.

[3] In 2018, Māori assets in the primary industries (excluding forestry) were worth around $19.1 billion, of which $1.1 billion are found in horticulture. BERL & The Reverse Bank of New Zealand (2018). *Te Ōhanga Māori 2018*. https://berl.co.nz/sites/default/files/2021-01/Te%20%C5%8Changa%20M%C4%81ori%202018.pdf

use of labour is reduced due to use of technology, there may be impacts on Pacific Island workers through the Recognised Seasonal Employer (RSE) scheme. On balance, officials and industry consider it is likely that the horticulture sector will continue to supplement its domestic workforce with RSE workers, but it is important that further work is undertaken to support Pacific Labour Mobility into New Zealand in sectors beyond horticulture. More broadly, there are opportunities to work with Pacific communities to understand how they can benefit from the Catalyst.

Legal professional privilege

## Climate and Resilience Implications

51 The Catalyst is a way for the horticulture technology sector to bolster resilience in the horticulture sector, in the wake of domestic climate impacts such as Cyclone Gabrielle, and disruptions to critical food systems from global conflicts such as in Ukraine. The horticultural technology sector can provide new technologies to support more resilient production processes and assist in responding to new consumer demands in an innovative way, supporting a high value and resilient horticulture sector.

## Other Implications

52 This paper has no legislative or regulatory impacts, or human rights implications.

## Consultation

53 This paper was jointly developed by the Ministries for Primary Industries and of Business, Innovation and Employment. The following departments were consulted: the Treasury, Department of Prime Minister and Cabinet, Te Puni Kōkiri, Ministry for Pacific Peoples, Ministry of Foreign Affairs and Trade, Ministry of Education, New Zealand Trade and Enterprise, and Callaghan Innovation.

## Communications

54 Communications for this initiative will be considered through the broader Budget 2023 process.

## Proactive Release

55 This paper will be proactively released once Budget 2023 announcements have been made, with appropriate redactions made.

## Recommendations

The Minister of Agriculture and the Minister for Economic Development recommend that the Committee:

1 **note** that in July 2020, Cabinet approved the launch of the Agritech Industry Transformation Plan [DEV-20-MIN-0110], aiming to scale up the value of New Zealand's agritech sector to aid our economic recovery from the COVID-19 pandemic.

2 **note** that in December 2022, Cabinet approved a refreshed Agritech Industry Transformation Plan for public consultation [DEV-22-MIN-0295]; which:

2.1 seeks to continue to accelerate the success of the sector and grow its contribution to the New Zealand economy to $8 billion by 2030;

2.2 maintains as a priority action the establishment of a Horticulture Technology Catalyst, which aims to position New Zealand as a leader in horticulture technology to meet the needs of the horticulture sector in New Zealand and globally.

3 **note** that in April 2022 Cabinet:

3.1 noted that the horticulture technology sector has significant potential for exports and benefits to New Zealand's horticulture sector.

3.2 noted that the indicative business case for the Horticulture Technology Catalyst sets out the strong value the initiative could deliver for New Zealand, including increasing New Zealand's GDP by approximately $141.0 to $347.1 million by 2035.

3.3 endorsed an indicative business case for the Horticulture Technology Catalyst and directed officials to develop a detailed business case for the Horticulture Technology Catalyst.

4 **note** that through the development of the Horticulture Technology Catalyst's detailed business case, refinements have been made to its delivery arrangements, costings, and proposed service scope, which will ensure the initiative's successful delivery.

5 **note** that funding for the Horticulture Technology Catalyst has been approved through Budget 2023, which includes $29.9 million over four years for its establishment and $8.15 million per outyear to ensure stable and enduring funding for the initiative's ongoing success.

6 **approve** the detailed business case to establish the Horticulture Technology Catalyst.

7 **note** that the Minister of Agriculture and the Minister for Economic Development will direct officials to engage with strategic service providers to establish the Catalyst and its operations from July 2023, with full operation expected from 2024.

8 **agree** that the Minister of Agriculture and the Minister for Economic Development will take necessary decisions during implementation and establishment of the Catalyst, consulting with other relevant Ministers as appropriate.

Authorised for lodgement

Hon Damien O'Connor

Minister of Agriculture

Hon Barbara Edmonds

Minister for Economic Development

# Appendices:

## Appendix One: Strategic and Operational Overview of the Horticulture Technology Catalyst

## Appendix Two: Horticulture Technology Catalyst Detailed Business Case

# STRATEGIC STRUCTURE OF THE HORTICULTURE TECHNOLOGY CATALYST

The Catalyst aims to develop New Zealand's horticulture technology sector to a high-growth, innovative industry cluster by increasing the sector's international connections, growing industry talent, and increasing collaboration and relationships across the horticulture sector.

## WHAT IS THE CATALYST TRYING TO ACHIEVE?

- **Position New Zealand as a world leader in horticulture technologies**
- **Enable commercial partnerships, resulting in the commercialisation of IP**
- **Provide the interface between market participants and enhance collaboration**
- **Deliver on the vision of the Agritech ITP**

## WHAT DOES SUCCESS LOOK LIKE?

**Ecosystem Connections**
A connected and cohesive ecosystem, focused on global and relevant opportunities

**Technology Commercialisation**
Commercialisation of technology and growing the number and size of companies in the industry

**Talent Development**
A pipeline of industry-ready talent to support the growing industry and creating high-value jobs

**Internationalism**
Enhanced global reputation and technology export opportunities

## DELIVERING A BESPOKE & INTEGRATED AGENCY SERVICE MODEL


## HORTICULTURE TECHNOLOGY CATALYST SERVICE MODEL

| Industry Connector | Talent Development | Project Facilitation |
|---|---|---|
| Enabling connections and collaboration across the ecosystem both domestically and globally | Facilitating the development of an industry-ready talent pipeline | Enabling and supporting the commercialisation of horticulture technology research and innovation |
| **Service Categories** | | |
| • International Immersions<br>• Inwards Missions<br>• Intelligence and Insight Reports<br>• Broad, Mixed Sector Industry Events<br>• Targeted Industry Events<br>• Communications<br>• Technology Showcases | • Co-ordinate Workforce Placements<br>• Capability Programmes<br>• Business Basics & Hygiene<br>• Facilitating Mentoring Support<br>• Industry Secondments | • Webinars & Workshops<br>• Commercialisation Advice<br>• Funding & Investment Access Support |
| **MBIE Hosted Programme Team** | | |

## COMPLEMENTARY SERVICES

Utililising existing and complementary market offerings and services

- Executive Commercialisation Training
- Real World Horticulture Training
- Post Graduate Qualifications
- Incubation & Accelerator Services
- Product Commercialisation

## WHO WILL THE CATALYST DELIVER THESE SERVICES TO?

- HORTICULTURE TECHNOLOGY COMPANIES
- GROWERS
- INVESTORS
- RESEARCH & TERTIARY INSTITUTES

## WHICH TECHNOLOGIES WILL BE LEVERAGED AND COMMERCIALISED?

- MECHATRONICS
- VISUAL SYSTEMS
- SENSING TECHNOLOGY
- DATA ANALYTICS
- VIRTUAL REALITY & HUMAN ASSISTANCE
- OTHER AUTOMATED SYSTEMS

# OPERATIONAL DESIGN OF THE HORTICULTURE TECHNOLOGY CATALYST

## HOW WILL THE CATALYST OPERATE?

The Catalyst is designed to ensure decisions are made at the appropriate level, with leadership and management providing continuity through the establishment and delivery of the Catalyst. A small number of new roles are required, with core services being delivered by a network of strategic partners.

**MBIE Senior Management – Governance & Oversight**

**Catalyst Leadership & Management Team**
Commercial management, relationship management, performance management, programme coordination, marketing and communication, and administration.

Industry Connector Services | Project Facilitation Services | Industry Talent Development Services

**Service Providers – Service Contracts**

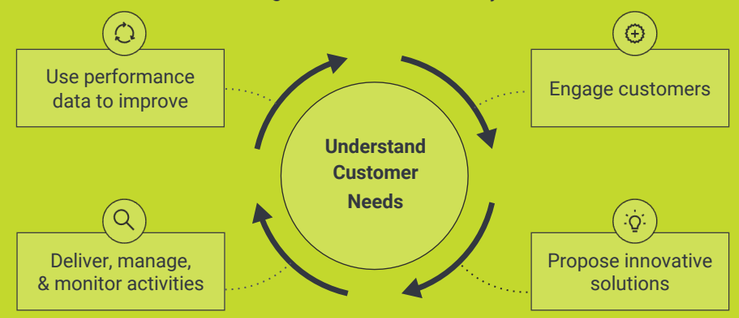
**Advisory Groups**

- ITP Steering Group
- Māori Advisory Group
- HTC Advisory Group

**The ITP Steering Group**
will set the strategic direction for the Catalyst, while the core Catalyst team will be responsible for the operational and financial decision-making.

**The core Catalyst team**
will continually engage with the advisory groups and customers to deliver services that meet the needs of the horticulture technology ecosystem. The core Catalyst team will contract Strategic Service Providers to deliver the services.

**Continual service design and refinement**
throughout the life of the Catalyst




## AFFORDABILITY & FUNDING

**$29.9M**
FIRST FOUR YEARS

**$8.15M**
ANNUAL COST

The Catalyst is estimated to cost **$29.9 million** to establish and operate over the first four years, with an annual cost of **$8.15 million** thereafter

## WHAT ARE WE BUYING?

COST COMPONENTS

**Leadership & Management**
Negotiations

**Contracted Services**
delivering services through service based contracts with third parties

**Digital Presence & Tools**
interactive web-based platform and promotional tools.

## TOTAL COST (4 YEARS) : $29.9M

OPERATING COSTS

| | |
|---|---|
| Leadership & Management | 6.88 |
| Contracted Services Digital | 20.28 |
| Presence & Tools | 0.5 |
| Capital costs | – |
| Contingency | 2.24 |
| **Total** | **29.9** |

## FUNDING

Baseline funding of $29.9m is being sought over the four year period July 2023 – June 2027

As well as **annual baselined funding** of $8.15 million for outyears

## TIMING

### 2023

**APR-JUN 2023**
**Pre-establishment**
- Transitioning horticulture technology projects from the ITP through to the Catalyst, with supporting engagement with Callaghan Innovation and NZTE.
- Recruitment preparation and advertising.
- Market scan.

**AUG 2023**
**Brand Formation & Launch Planning**
- Design of initial branding and marketing channels.
- Development of online services platform.
- Development of ecosystem analysis and horticulture technology insights.

**JUL 2023**
**Recruitment**
- Standing up the Catalyst team, recruitment of General Manager and Programme Director.
- Pre-Establishment Team providing some initial / transitional services.

**SEP 2023**
**Detailed Planning**
- Detailed service design, and development of pipeline of service activity.

### 2024

**JAN 2024**
**Strategic Partnerships**
- Initial Partnership Agreements and Statements of Work developed with Strategic Service Providers.
- Catalyst fully established.
- Ongoing refinement of digital channel and online services platform.

**APR 2024**
**Collaboration**
- Strategic Partnership Agreements underway.
- Continued collaborative design of service activities.
- Contracting: service activity specific SoWs.

**JUN 2024+**
**Catalyst Phase One**
- Core service delivery underway.
- Evaluation of strategic partnerships and activities delivered to date.
- Ongoing refinement of Catalyst service activities.

# Horticulture Technology Catalyst

## Detailed Business Case

February 2023

COMMERCIAL IN CONFIDENCE

Ministry for Primary Industries
Manatū Ahu Matua

Ministry of Business, Innovation & Employment
HĪKINA WHAKATUTUKI

# Document Control

***Document Information***

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| 3 | 20.02.23 | Final Draft Business Case |
| 4 | 24.02.23 | Final Draft Business Case Updated for MBIE and IRG feedback |
| 5 | | Final Business Case |

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| | | |

# Contents

# Figures

# Tables

# Introduction

*The Horticulture Technology Catalyst is a High Impact Project as part of the Agritech Industry Transformation Plan.*

This business case is a joint effort between the Ministry of Business, Innovation and Employment, the Ministry for Primary Industries, and the Horticulture Technology Catalyst Industry Reference Group.

We would like to thank the Industry Reference Group members for their time, input and expertise, and Callaghan Innovation and New Zealand Trade and Enterprise for their support. Over the course of this project the Group membership has evolved and has comprised representatives from research institutions, technology companies and grower organisations, working alongside government enablers.

The principle of partnership has underpinned the Horticulture Technology Catalyst's development and this will continue into its implementation. With the Industry Reference Group, we have explored how we turn many of the challenges the industry is facing into opportunities by working openly and honestly together.

And there certainly are challenges, particularly as consumer, climate and environmental changes mean innovative technology to address the challenges facing horticulture domestically and globally. This context presents the opportunity to work closely with industry to make a lasting impact that matters.

Ministry of Business, Innovation & Employment
HĪKINA WHAKATUTUKI

The Ministry of Business, Innovation and Employment (MBIE) is the Government's lead business-facing agency. Its contribution to improving the well-being of New Zealanders is summarised in its stated purpose: to grow New Zealand for all.

'For all' means all people have an opportunity to participate in and benefit from the economy. For MBIE, a successful New Zealand looks like:

- Prosperous and adaptable people, sectors, and regions
- People are skilled and engaged in safe and fulfilling work
- Informed consumers and businesses interacting with confidence
- Value is sustainably derived from the natural environment
- A dynamic business environment fostering innovation and international connections.

Ministry for Primary Industries
Manatū Ahu Matua

The Ministry for Primary Industries (MPI) focus is to help seize export opportunities for our primary industries, improve sector productivity, ensure the food New Zealand produces is safe, increase sustainable resource use and protect New Zealand from biological risk.

MPI's 'Fit for a Better World' vision brings together opportunities that the Government considers will accelerate productivity, sustainability and inclusiveness of the food and fibre sector, grouped together across three pillars:

- Productivity – adding $44 billion in export earnings over the next decade
- Sustainability – contributing to New Zealand's journey to a low emissions economy by reducing biogenic methane to 24 – 47% below 2017 levels by 2050
- Inclusiveness – employing 10% more Kiwis from all walks of life in the food and fibre sector by 2030

# 1 Executive Summary

## 1.1 Introduction

This Detailed Business Case (DBC) seeks formal endorsement from Cabinet and Joint Ministers to implement the Preferred Option.

The Preferred Option is to implement the Horticulture Technology Catalyst, which aims to develop New Zealand's horticulture technology sector as an innovative industry to grow its global presence and support the domestic horticulture sector's growth. The Preferred Option is to establish a contract-based set of services, to accelerate the growth of New Zealand's horticulture technology sector. The three key service areas are:

- Industry Connector
- Industry Talent Development
- Project Facilitation

The Financial Case indicates $29.9 million will be required to establish and deliver Catalyst activities over the first four years of operations. The Horticulture Technology Catalyst Budget bid is also seeking baselined funding for outyears, of $8.15 million per outyear.

Through-life operating expenditure over a 10-year time horizon is estimated at $56.5 million.

An Economic Impact Assessment for the Preferred Option, conducted for the indicative business case (IBC) found it could facilitate a present value increase in GDP between $142 and $347.1 million, and an additional $80 – $160m (nominal) of exports per year by 2035.

### Background

The Catalyst's indicative business case was developed by Callaghan Innovation under a funding agreement held by the Ministry for Business, Innovation and Employment (MBIE), with the Ministry for Primary Industries (MPI) also involved in the business case's development. MBIE and MPI are now leading the development of the Catalyst's detailed business case, in close partnership with Callaghan Innovation and New Zealand Trade and Enterprise (NZTE). These four agencies are the key government delivery agencies for the Agritech Industry Transformation Plan (ITP), alongside industry partners such as AgriTechNZ.

The Catalyst involves MBIE acting largely as a "purchasing agency", collaborating with other agencies to fund service delivery to the sector. This provides a flexible business model that can be refined and enhanced in response to evolving sector needs.

Cabinet endorsed the Catalyst's indicative business case in April 2022 (DEV-22-MIN-0083 refers). Key parts of the Catalyst's proposed services are being stood up and proved out as part of DBC development, validating the need for the support the Catalyst can provide.

The Agritech ITP's implementation since July 2020 has been funded through $11.4m provided through Budget 2020. This has included developing the Catalyst's business cases as well as piloting its services through funding agreements with Callaghan Innovation and NZTE. The Horticulture Technology Catalyst is a High-Impact Project under the Agritech Industry Transformation Plan, and is a cornerstone of its vision and direction.

Certainty of funding is key to the Catalyst's success. While piloting activities with the agritech sector to date have been successful in validating demand and potential for growth, they have been limited in scope and time. Funding the Catalyst in an enduring way will signal to the sector a commitment to support its growth, which will ensure industry participants can be confident they are building a relationship with a trusted long-term advisor, rather than a temporary initiative.

Since 2020, the Catalyst's design has developed and evolved in close partnership with industry stakeholders:

- It was first proposed as a Horticulture Robotics Academy to focus only on addressing skills shortages in the sector.

- In response to industry and partner feedback, it then shifted to a Horticulture Robotics Catalyst to address connection, global relevance, and project facilitation issues in the sector.
- Finally, it shifted to the Horticulture Technology Catalyst to reflect the interconnectedness of horticulture technology, and the high demand globally and domestically for a spectrum of technologies beyond simply robotics and automation.

## 1.2 Strategic Case

### Strategic context

#### Why support the growth and innovation of horticulture technology?

The Agritech ITP places an emphasis on technologies in which New Zealand both has a competitive advantage, and which can be scaled and exported globally. Horticulture technology is one such area for New Zealand – there is existing domestic strength, capacity for further growth, and a significant international opportunity to export at scale. However, companies are also challenged by the ability to 'think globally' from the start when they are often created in 'hyper local' environments.

Across the world growers are facing challenges such as labour availability, adapting to climate change, as well as consumer preferences for safe food and traceability requirements for these preferences. Technological innovations can help to address these challenges and improve productivity in horticulture. For example, mechatronics and automation can supplement or replace labour requirements, while sensing technologies can increase efficiency and improve sustainability, particularly in areas like nutrient management for plant health. It can also create operational efficiencies and provide solutions for food safety, traceability, and improving work health and safety.

Ultimately, horticulture technology can help build resilience in critical food systems. Most recently,the catastrophic effect of Cyclone Gabrielle has highlighted the vulnerability of our current horticulture production systems and the resilience of our overall food system in the face of a changing climate. A huge challenge lies ahead for New Zealand, to rebuild again, but with that comes opportunity for a stronger horticulture technology sector as well as a stronger horticulture sector. International events, including recent events in Ukraine, can expose the vulnerability of these highly people-dependent sectors in times of crisis. Equally, the drought-affected growing region of California is increasingly looking to horticulture technology to maintain production while managing the impacts of environmental degradation.[1] In New Zealand, the supply of freshwater is critical in key growing regions. It is essential for growing crops and for post-harvest washing and processing. A growing population, competing land-use demands, water and environmental quality concerns and storage constraints are all placing pressure on the industry's ability to access and use the water it requires.

#### Government's economic plan and other initiatives

ITPs are a key initiative for the Government's economic plan to build a high-wage, low-emissions, secure economy, contributing to the plan's focus are of unleashing business potential. Horticulture technology is a strategically important sector for economic growth due to its direct economic value and its potential to increase productivity in our food and fibre sectors, while also increasing sustainability (e.g. through reduced emissions).

The Catalyst is intended to help realise these goals and is further aligned with recommendations from the Productivity Commission's commission into Frontier Firms, as it aims to support focused innovation in horticulture technology. This inquiry recommended government investment be focused on areas of existing or emerging economic strength and competitive advantage, as a small country can excel in only a limited number of areas that can get to critical mass and support sustained world-class competitive performance.

Finally, the development of the Catalyst has also been informed by Te Ara Paerangi – Future Pathways, and is aligned with its direction. Te Ara Paerangi aims to create a modern, future-focused research system for New Zealand, which is adaptable for a rapidly changing future, resilient to changes, and connected; to itself, to

[1] https://dot.la/heres-the-technology-that-could-help-california-conserve-more-water-2655490829.html

industry, to public sector users of research, and internationally. The Catalyst particularly aims to address issues of connection between research and businesses.

**Fit for a Better World Strategy**

Horticulture is set to reap additional export revenue as the food and fibre sector aims for a $44 billion increase in export revenue under the Fit for a Better World roadmap, which outlines an investment plan to achieve a more productive, sustainable and inclusive economy. The roadmap commits to accelerating access to new high-value plant varieties, and supporting the commercialisation of new products, while addressing barriers to innovation.

The roadmap sets out three ambitious targets to achieve a more productive, sustainable, and inclusive economy within the next decade. It's targets are ambitious but backed up by the sector's track record: In the 10 years to 2022, horticulture and viticulture exports almost doubled, from $3.5 billion to $6.8 billion.[2] This scale of growth will not be achieved under current settings, within a sector facing increasing labour supply constraints, as well as impacts from climate change. This growth opportunity will only be realised through investment from government and industry that helps drive technology advancement.

**ITP Recommendations**

The Horticulture Technology Catalyst strongly aligns with a 2021 report commissioned under the ITP to canvass gaps in the NZ agritech ecosystem. It had a particular focus on issues in the investment and commercial-related aspects of the ecosystem, identifying responses to these issues and opportunities that they present.

The report recommends:

- Investing in skills, especially the early-stage commercial expertise surrounding young companies
- Fostering a culture of collaboration through the development of specialised clusters of excellence around areas of advantage (e.g. robotics and automation)
- Reconfiguring the top of the agritech funnel such that R&D funding criteria ensure greater alignment of innovations with international markets and customer needs
- Improved coordination and oversight of government business funding and financing programmes in order to target funding gaps with innovative, scale mechanisms.

### The Food and fibre sector is a significant part of New Zealand's economy

New Zealand's food and fibre sector is an important export contributor, producing enough food to sustain an estimated 40 million people per year.[3] New Zealand is recognised as a high-quality producer in key export markets across Australasia, Europe and Asia, and New Zealand is known for more than just its dairy exports – its fruit and vegetables can command export premiums and are growing as an export earner. In 2022, food and fibre exports exceeded $53 billion, up 11% on the previous year.

On the back of shifting dietary preferences, with plant-based diets and products becoming more popular, and increasing environmental awareness in developed markets, there is a pressing need for further developments to address labour shortages, food safety, sustainability and traceability challenges, which are real and pressing issues apparent within horticulture supply chains. New Zealand technology companies, backed by a strong government mandate in the Agritech ITP to build an export sector around such innovation, are well placed to deliver these solutions. Given the scale and significance of this sector to the economy, it is important to make targeted investment in specific subsectors such as horticulture, to ensure they are able to capitalise on local and global markets and reach their potential.

### Why horticulture?

Horticulture is a high-value target industry within the food and fibre sector, and in recent years has been growing strongly, making up around 13 percent of the country's total food and fibre exports – nearly $7 billion of a $53

[2] MPI, Situation and Outlook for Primary Industries, December 2022
[3] Sustainable food supply NZ G2G - Sustainable food supply | NZTE

billion industry in 2022.[4] According to Horticulture New Zealand, the sector is also well placed to help New Zealand reduce its emissions, while also enabling the economy to grow. There is a strong value proposition to support additional growth for the sector through the utilisation of horticulture technology, with significant opportunities in areas such as automating operations.

**Climate change**

Climate change is driving the need for innovation both in New Zealand and across the world, to help develop a horticulture sector resilient to rising sea levels, increased frequency of severe weather events, heat stress, and new and different pests and diseases. For example, local company Hectre's technology helps growers to mitigate the environmental impacts of operations through effective and efficient management of pesticides and other chemicals used in horticulture, and has recently completed a $3.5 million capital raise.

Horticulture technology that increases the efficiency of the industry will be needed as New Zealand moves towards regulating agricultural emissions, and consumers, governments, and private companies around the world demand more from their suppliers and growing communities.

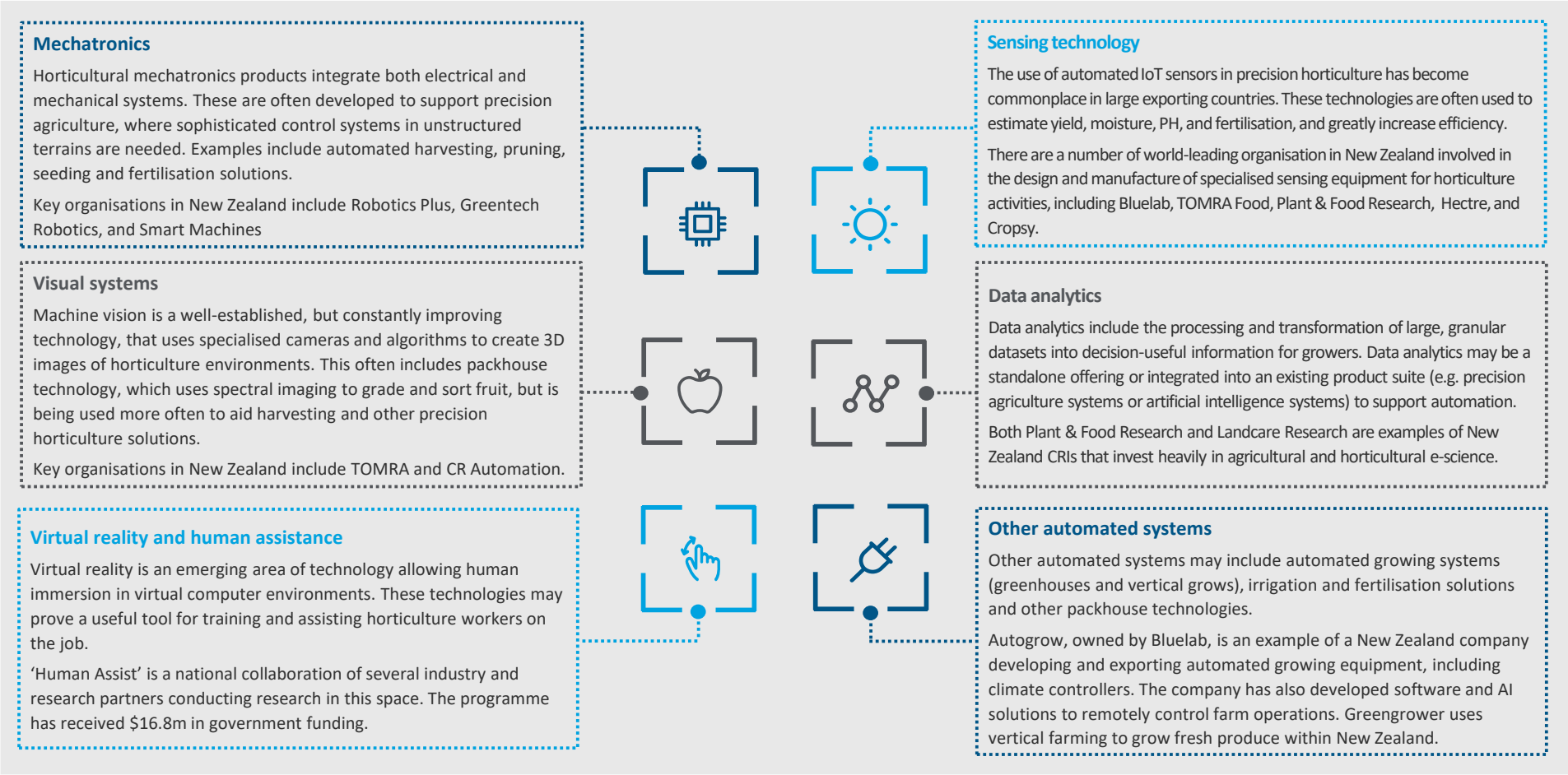
[4] MPI, Situation and Outlook for Primary Industries, December 2022

## What is horticulture technology?

Horticulture technology is more than just irrigation systems. New Zealand technology companies are developing a wide range of automated, genetics and software solutions intended to integrate with precision horticulture systems and add value post-harvest.

New Zealand has the skills and capability to be a world player. What it needs is government backing to scale, and support to activate the existing potential, foster talent and commercialisation opportunities.

**Figure 1: Horticulture technology types**



## The Case for Change

For New Zealand's horticulture technology sector to grow and realise its potential, it needs to significantly increase its alignment and collaboration, while deliberately targeting international opportunities for exports at scale. While this may happen very slowly over time, targeted government support will galvanise the sector and ensure its growth is targeted towards the most important domestic and international problems facing the horticulture sector.

### Why Must Current Arrangements Change?

New Zealand's horticulture technology sector has significant potential for growth due to a high and increasing global and domestic demand for solutions to issues facing the horticulture sector (e.g. labour availability, climate change adaptation, changing consumer preferences). The horticulture technology sector currently has pockets of excellence, but faces constraints that mean the sector's growth is not as strong as it could be:

- **The current horticulture technology ecosystem is disconnected**, with a lack of relationships between growers, researchers, technology developers, and investors. This is reflected in duplication of efforts and research themes across academia and researchers.
- **A shortage of skills for technology companies**, particularly graduates with commercial skills. Further, a focused skill development approach is lacking across the sector.
- **Research and commercialisation activity could be better connected**, with opportunities not pursued and intellectual property (IP) not commercialised due to a lack of access/relevance to, or understanding of, global markets, limited public and private funding, and scaling challenges.
- **Businesses find it difficult to navigate existing public funding** and feel there is limited assistance to achieve global scale.

The Catalyst, underpinned by global and local industry intelligence, would play a key role in filling a gap in the current ecosystem by driving collaboration and cohesion across the ecosystem, and facilitating strong regional connectivity.

### What is the connectivity gap in the market the Catalyst will fill?

- **Connect technology companies with growers** – The Catalyst will help provide a detailed understanding of the current makeup and growth of the horticulture technology sector, and enable participants to better understand what key challenges the horticulture sector is facing and what solutions are already available. Technology companies need to understand pressing issues across various horticulture sub-industries, and growers need up-to-date awareness of the products available that could make existing operations more effective and efficient.
- **Connect research sector with growers** – The Catalyst's reach into the research community will be to help 'unblock' the problems research close to the market could be facing – in terms of support with project facilitation, and helping to find early adopter growers to test solutions. Providing this connection will give researchers new opportunities to solve commercial issues facing growers today.
- **Facilitate international market relationships** – The Catalyst will assist in connecting both researchers and technology companies in the commercialisation stage, helping to showcase solutions and products to the global economy, providing a channel to the global markets.
- **Connect firms with services and help navigate funding channels** – The Catalyst will bring parties together and provide leadership and support services to enable projects to reach commercialisation critical mass.

### What are the key challenges in the horticulture sector that technology can help address?

The industry needs support to foster innovation and commercialisation opportunities, ultimately helping the horticulture sector overcome current market challenges.

There are key challenges and megatrends affecting the horticulture sector, which form the foundation for the need for investment and change.

**Figure 2: Key drivers**


## The opportunity to support the growth of innovative horticulture technology solutions

The current environment provides a unique opportunity to strengthen and support New Zealand's horticulture technology industry.

Challenges within horticulture are driving a rising demand for innovative technology to improve productivity, enhance sustainability, traceability and reduce concerns around labour shortage and escalating costs. As the market gains further awareness of technological advancements, it becomes the logical starting point for making improvements.

**Table 1: Opportunity drivers**

| Drivers | Overview |
|---|---|
| **There is interest and demand in both the domestic and global markets** | Growers are striving to produce more food or product, at a higher quality, in a more sustainable and traceable way. The governments of countries including Ireland, Israel, Singapore, and the United Kingdom are all supporting or incentivising agritech adoption and market growth. This is because around the world, growers are seeking solutions to challenges similar to those faced by New Zealand growers. Horticulture technology developed locally has the ability to be applied globally and to attrach international investment and paths to market. |
| **New Zealand has the ability and relationships to make a mark on the global market** | New Zealand's ability to attract deals and create global events is backed by over 150 years of agricultural innovation and a reputation as a top-quality food producer. With a healthy and growing industry body in AgriTechNZ, global partnerships with the organisations such as Western Growers, the Silicon Valley Forum, Farm 2050, and a growing industry reputation, New Zealand can make its mark. |
| **Māori horticultural interests represent an opportunity** | Young Māori have significant potential in the labour force and will comprise around one-fifth of the working-age population by 2043.[5] Research from the Treasury suggests adapting and using new technologies cannot be underestimated for rangatahi Māori to unlock opportunities to move them into higher-skilled career pathways.[6]<br>Māori own around 5% of the country's horticultural land, including around 8% of total land planted for onions, and 9% of kiwifruit. It's estimated around $220 million in gross output is generated through Māori horticultural operations, and nearly 4,000 Māori are employed in the sector – around 17% of the total horticultural workforce.[7] With such strong interests in the sector, being able to access, use, and participate in the development of horticulture technology is key. |

[5] Analytical Paper 22/02: Background Paper to Te Tai Waiora: Wellbeing in Aotearoa New Zealand 2022: Trends in Maori Wellbeing - 12 December 2022 (treasury.govt.nz)
[6] Analytical Paper 22/02: Background Paper to Te Tai Waiora: Wellbeing in Aotearoa New Zealand 2022: Trends in Maori Wellbeing - 12 December 2022 (treasury.govt.nz)
[7] https://www.tpk.govt.nz/en/o-matou-mohiotanga/whenua/maori-in-horticulture-2020-research-report

### Now is the right time to bolster the horticulture technology sector

The global market demand for horticulture technological innovations is strong and increasing due to the challenges facing the horticulture sector, both domestically and globally.

Since the launch of the Agritech ITP in 2020 during the Covid-19 pandemic, the domestic and international economies have changed dramatically. Supply chain disruptions throughout 2021 and 2022 were exacerbated by repeated manufacturing shut-downs in China, and the Russian invasion of Ukraine, and these impacts are still being felt. Growing both the horticulture technology and the horticulture sectors are essential to New Zealand's post-Covid economic recovery and future resilience, particularly as the possibility of global recession looms for 2023. A strong horticulture technology sector will be increasingly important to improving the horticltural sectors resilience in the face of a changing climate eg. Improved resilience to events such as Cyclone Gabrielle.

New Zealand's horticulture technology sector needs international markets for the appropriate level of opportunity to scale up. International connections and partnerships can provide the sector with the critical mass to become a successful and self-sustaining sector. An international outlook is a hallmark of globally successful agritech sectors.

Now is the time to support the horticulture technology sector to drive innovation and help the horticulture sector achieve its ambitious growth plans over the next decade. Without focused support, New Zealand's horticulture technology sector will miss a significant opportunity for expansion.

### Service Validation Journey: From market gap analysis, to service design and piloting of programmes

A range of activities have been undertaken since 2020 to scope, validate and refine the core services needed to meet the needs of the market. This includes:

1. **The market gap analysis and service validation process:** designing and validating the services
2. **Market engagement:** engaging stakeholders and the Industry Reference Group members throughout the service validation process
3. **Pilot programmes:** running pilots to test proposed types of services and activities, and refining service offerings based on feedback provided

Service providers Callaghan Innovation and NZTE have been piloting activities in collaboration with wider Agritech ITP initiatives. These have been well-received by the horticulture technology sector, and delivery agencies report there is significant scope to expand and continue these services.

## Problem Statements

The problems the proposed investment will need to address are:

- Opportunities not being pursued and IP failing to be commercialised, due to lack of access to global markets, limited public and private funding, and scaling challenges.
- A fragmented sector and lack of connection between growers, technology developers and investors has reduced access to on-the-ground, lived experiences, slowed the speed of innovation and resulted in a disconnected flow of commercialisation activity.
- Difficulties navigating pathways to existing public funding, grant schemes, and other business support, provided through a range of government agencies.
- A lack of industry focus for STEM graduates, resulting in a disconnect between technical expertise and practical, commercial outcomes and ultimately difficulties for technology companies to attract the right talent.
- Difficulty attracting and retaining skills and talent in the horticulture technology sector.

### Investment Objectives

The objectives of the proposed investment are:

**Table 2: Investment Objectives**

| | |
|---|---|
| **Investment Objective One** | Positioning New Zealand as a world leader in horticulture technologies |
| **Investment Objective Two** | Enabling commercial partnerships, resulting in the commercialisation of IP |
| **Investment Objective Three** | Providing the interface between market participants and enhancing collaboration |
| **Investment Objective Four** | Delivering on the vision of the Agritech ITP |

### Benefits

The benefits the proposed investment seeks to deliver are:

**Table 3: Benefits**

| | | |
|---|---|---|
| **Benefit One** | Innovation among horticulture technology companies is accelerated | KPI 1: Number of companies using the Catalyst<br>KPI 2: Number of companies commercialising innovation |
| **Benefit Two** | Greater connectivity leads to improved access to horticulture technology and enables greater production for the domestic horticulture sector | KPI 1: Number of horticulture growers using technology solutions<br>KPI 2: Domestic horticulture production grows |
| **Benefit Three** | Export of horticulture technology grows | KPI 1: Number of horticulture technology companies exporting<br>KPI 2: GDP contribution of horticulture technology |

## 1.3 Economic Case

### Options Development

The Economic Case explores the investment options considered for the Horticulture Technology Catalyst and identifies the best value-for-money option. The Case explores the potential of the Horticulture Technology Catalyst, what it offers the industry and how it would benefit key stakeholder groups.

Six long-list options were developed based on a set of dimensions. Each option was evaluated against the Investment Objectives and Critical Success Factors in order to agree a short-list of three options, in addition to the Status Quo, to take forward before selection of the Preferred Option.

Since Cabinet approved the indicative business case in April 2022 and approved Option B as the Preferred Option, there have been significant changes in both the economic and fiscal environment. While the core service and focus remain unchanged, the Preferred Option has been modified in recognition of these fiscal pressures, shifting to a more agile, virtual delivery approach, rather than looking to lease and fit-out new premises. It is also now looking to outsource core services, through service-based contracting, reducing the number of new personnel required to operate the Catalyst.

#### Short list options

**Status Quo**

A Status Quo scenario would represent a missed opportunity for New Zealand to grow a strategic high value-add export sector. Without the Catalyst, there will be no entity to deliver dedicated horticulture technology-focused services. If funding is deferred or not approved, the credibility of the Agritech ITP and the broader ITP

programme may suffer, as industry may question the commitment to transformation by its government partners. This may make it more difficult for government to gain industry buy-in to broader involvement with, and specific action and priorities delivered through, the Agritech ITP programme. If the Catalyst is not funded the pilot programmes tested to-date will not continue in their collective form, as Agritech ITP funding, currently supporting the pilots, ceases in June 2024. Activities from 2023/24 ITP funding are yet to be scoped, agreed, and procured.

The scope of each of the short-list options is captured in the following table:

**Table 4: Short list of options**

| Option | Key Dimensions | |
|---|---|---|
| **Option A: Catalyst Light**<br>Industry connector services and activities are offered by a light-touch Catalyst – essentially a do-minimum option. The Catalyst would better connect existing government services and play a facilitating role between technology companies, funding providers, and domestic and international commercialisation partners. The Catalyst would be delivered virtually but would still have a presence in key growing regions through working alongside industry players. | Sector focus | Horticulture Technology |
| | Technology focus | Robotics and automation |
| | Service focus | 1 core service:<br>Industry Connector |
| | Service delivery | Virtual Catalyst – contracted services |
| | Infrastructure | N/A – use existing offices (e.g. MBIE) |
| **Option B: Targeted Services**<br>The Catalyst would deliver more expanded services than Option A. It is more than a connector – it would deliver a range of services across industry talent development and in relation to project facilitation and commercialisation support. Stakeholders have indicated industry talent development is key to building resilience and skills, and targeted project facilitation and workshops would assist directing organisations to the right support. Per Option A, this would focus on the horticulture technology sector and would be delivered virtually. | Sector focus | Horticulture Technology |
| | Technology focus | A broad technology focus, excluding genetics |
| | Service focus | 3 core services:<br>Industry Connector, Industry placements and student development opportunities, Project Facilitation (includes three sub-services) |
| | Service delivery | Virtual Catalyst – contracted services |
| | Infrastructure | N/A – use existing offices (e.g. MBIE) |
| **Option C: Catalyst Plus**<br>This option delivers the widest range of services to horticulture technology companies, and duplicates some services already existing in the market. In this option, the Catalyst would also be directly involved in owning commercialisation activities, and hold intellectual property, as well as house a full education academy. In addition to entering leasehold arrangements with current like-minded companies and organisations in key regions, the Catalyst would also develop a purpose-built facility, which would act as the central hub. | Sector focus | Horticulture Technology |
| | Technology focus | Robotics and automation |
| | Service focus | 3 core activities + 5 enhanced activities (enhanced talent development and enhanced project facilitation and commercialisation support) |
| | Service delivery | Service delivery through central hub and regional nodes, with a larger contingent of personnel to deliver services |
| | Infrastructure | Central hub construction and leased regional offices |

## Options Evaluation Process

At a facilitated benefits workshop, stakeholders reviewed and scored the short-listed options against their ability to meet Investment Objectives, realise Benefits, and mitigate Risks. The whole-of-life costs (WOLC) of each of the short-list options were then considered to assess value for money.

A costing exercise was undertaken to determine the relative whole-of-life costs of each of the options over a 10-year operational period.

The assessment results are illustrated in the table below – Option B (Catalyst: Targeted Services) was confirmed as the Preferred Option.

**Table 5: Option assessment summary**

| **Options** | **Status Quo** | **Option A** Catalyst Light: Industry Connector | **Option B** Catalyst: Targeted Services | **Option C** Catalyst Plus |
|---|---|---|---|---|
| **Net Value Score** | - | 56 | 79 | 69 |
| **WOLC** (discounted) | - | $29.9m | $56.5m | $118.4m |
| **Ranking** | **4** | **2** | **1** | **3** |
| **Result** | **Discounted** | **Discounted** | **Preferred Option** | **Discounted** |

### Potential impact

The need for the Catalyst is also supported by the economic impact assessment outlined on page 78, which shows the value to New Zealand the Preferred Option could generate, across GDP impact, export growth and job creation. The Computable General Equilibrium (CGE) modelling found the Catalyst could contribute between $141 – $347 million to national GDP, including $46 – $94 million to exports from establishment of the Catalyst until 2035.

Even under the “low” scenario modelled, the Catalyst’s potential impact is sizeable ($141 million increase in GDP in present value terms), sufficient to justify its development, and is more than double the whole-of-life cost of the Preferred Option.

## The Preferred Option

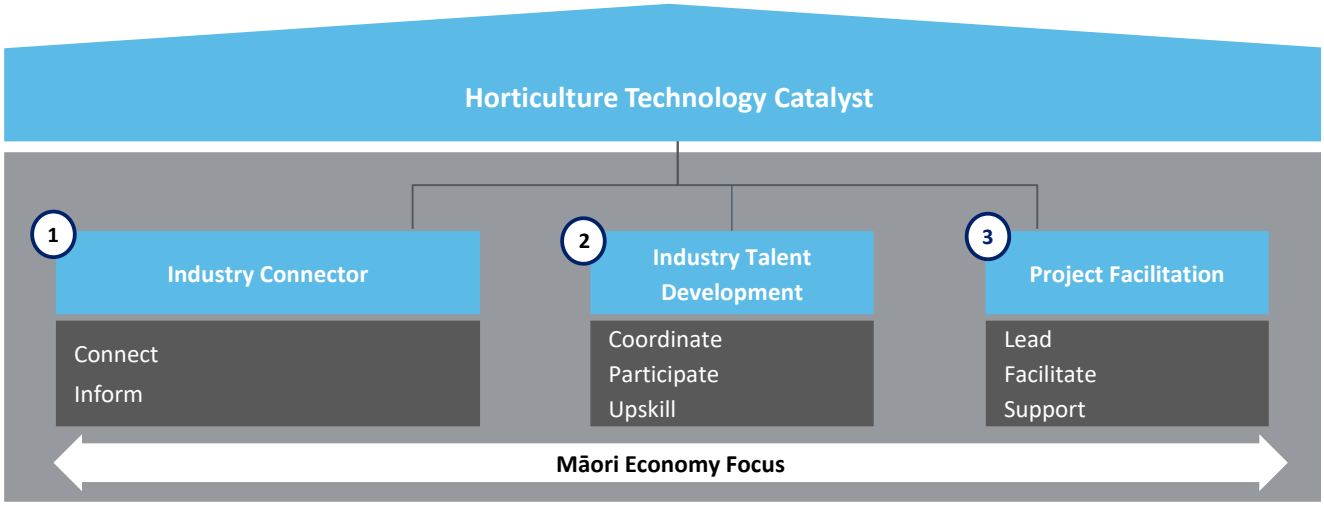
Option B (Catalyst – Targeted Services) is the Preferred Option. Option B meets investment objectives, delivers the desired benefits, and is comparatively affordable. It is considered to optimise public value for the Horticulture Technology Catalyst.

While Option A is cheaper, stakeholders indicated the Industry Connector function alone is unlikely to achieve the benefits to the same degree as Option B, and would not offer enough differentiation from other market participants. Option B is more affordable than Option C, which is an important consideration in this current inflationary environment. Option C has the highest cost, as a result of the large number of FTEs required to provide the range of services, and it also requires significant capital outlay in building a bespoke facility.

### What will Option B deliver?

The Catalyst will enable stronger collaboration across the industry, empower the industry to be innovative and support organisations in their drive towards technology adoption and commercialisation opportunities. Figure 3 shows the three key groups of services the Catalyst will deliver. The design of the specific activities will be based on the purpose and scope of each service, outlined in Table 24.

**Figure 3: Key Services**




## 1.4 Commercial Case

The Preferred Option (Option B: Catalyst – Targeted Services) requires procurement of key personnel and the design and establishment of the Catalyst as a brand, as well as the core set of services. The Commercial Case identifies the approach for how these services will be procured and contracted for.

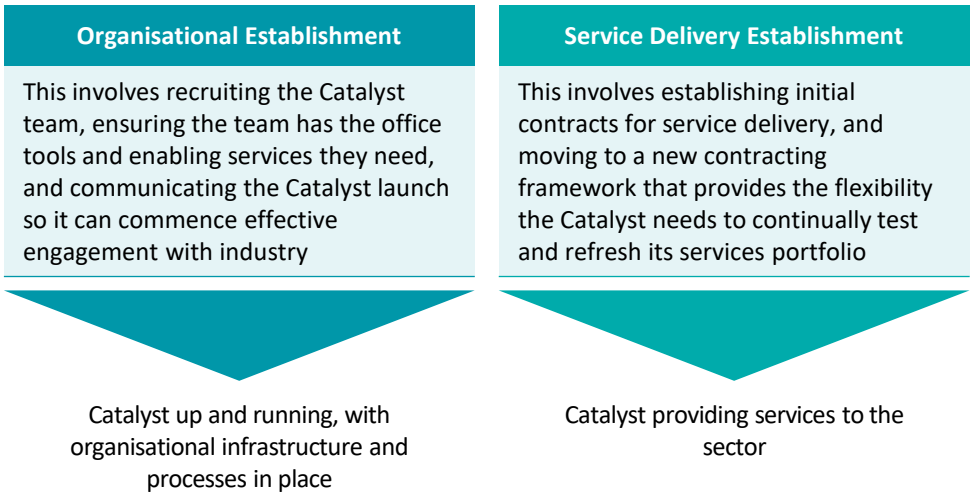
MBIE's specific procurement policies will be applied and followed as appropriate. This includes leveraging MBIE's organisational procurement teams and established supplier panels where practical.

The procurement strategy for Catalyst service delivery is to collaborate and partner with a range of Crown entities with specific experience in delivering similar services, and particularly those already involved in the ITP. This is expected to cover the majority of services over the first 12-18 months of Catalyst operations, and would be supplemented by further procurements and commercial relationships as required.

### Procurement Approach

There are two distinct streams of procurement:

**Figure 4: Procurement model**



### Organisational Establishment

Establishing the Catalyst will require consideration of the following:

- **Professional Services:** A range of professional services might be required such as recruitment and talent search, financial, accounting, economic and legal advice, communications, branding and design, and digital design support for the online services platform. Any such services will firstly be provided by incumbent MBIE arrangements, or procured via MBIE's existing All of Government and preferred provider panels, and in consultation with relevant MBIE functional teams.
- **Office equipment:** Team accommodation, office and ICT equipment/infrastructure will be sourced through MBIE's normal processes and providers, led by relevant MBIE functional teams.
- **Digital channel and online services platform:** The initial scope and requirements for this will be developed collaboratively within the multi-agency ITP team. All initial procurements required for organisational establishment are expected to be below $500,000 in value.

### Service Delivery Establishment

The majority of services will be delivered by a small number of Strategic Service Providers. Strategic Service Providers are expected to be Crown entities already involved in delivering ITP pilots and services (such as Callaghan Innovation and NZTE), and potentially other Crown Research Institutes (CRIs) or tertiary institutions. In the medium term, other organisations (including private sector) may be Strategic Service Providers as the market and service needs evolve, and would be considered through the Catalyst's normal business practices at such time.

Services will be contracted as multi-year partnership agreements which may include a baseload of service delivery and provide an umbrella contract for individual statements of work, or just as individual, time-limited statements of work, based on service requirements, and used for specific services and projects.

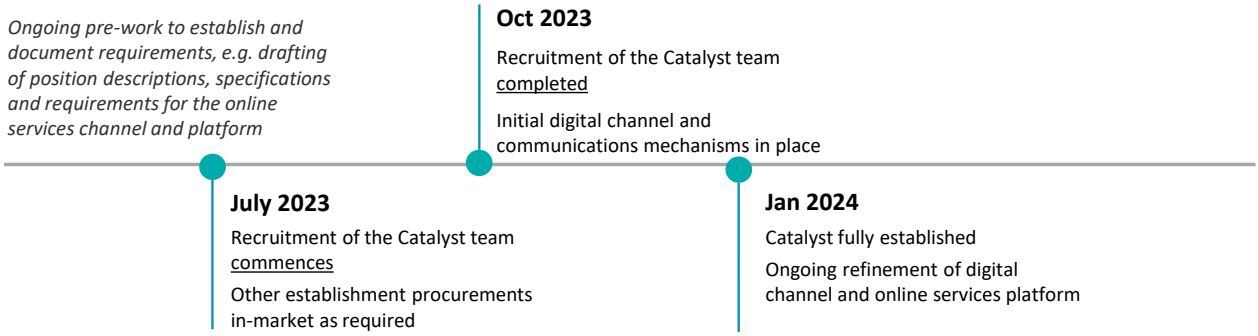
MBIE (as the host organisation for the Catalyst) will retain accountability for service performance through these contracting arrangements.

### Procurement Timelines

The project timelines presented support key phases across the project, and are subject to Cabinet decisions and availability of funding.

**Figure 5: Procurement timeframes**

***Organisational establishment timing***




***Service delivery establishment timing***


## 1.5 Financial Case

This Financial Case summarises the affordability and funding arrangements for implementing the Preferred Option - Option B: Targeted Services.

### Investment Costs

The Preferred Option balances the achievement of benefits and investment objectives against costs to deliver a value for money solution. The total cost of the Preferred Option is estimated at $29.9 million over four years and $8.15 million per outyear. The below table outlines the key cost drivers and the expenditure of this investment over time.

**Table 6: Total expenditure ($ millions nominal)**

| Investment Expenditure ($m) | 2023/24 | 2024/25 | 2025/26 | 2026/27 & outyears | Total |
|---|---|---|---|---|---|
| **Operating costs** | | | | | |
| Leadership and Management | 1.31 | 1.81 | 1.86 | 1.90 | **6.88** |
| Contracted Services | 3.73 | 5.43 | 5.52 | 5.61 | **20.28** |
| Digital Presence and Tools | 0.4 | 0.05 | 0.05 | 0.05 | **0.5** |
| **Capital costs** | – | – | – | – | – |
| **Contingency** | 0.52 | 0.56 | 0.57 | 0.59 | **2.24** |
| **Total** | **5.91** | **7.85** | **8.00** | **8.15** | **29.9** |

Contracted services are a main cost component which will enable the score scope of services outlined for the Preferred Option in Table 17 in the Economic Case to be delivered.

### Funding and Affordability

Total funding required to deliver the Preferred Option is currently estimated at $29.9 million for both upfront establishment costs and ongoing operational costs for the period July 2023 to June 2027. This funding is to support net-new activity with a horticulture technology focus, not currently delivered by the organisations which have developed and/or supported this business case. The Horticulture Technology Catalyst Budget bid is also seeking ongoing $8.15 million annual baseline funding for outyears.

Operating funding will be sought from central Government. If funding is deferred or not approved, the Catalyst's services will not be provided in any dedicated way.

## 1.6 Management Case

The Management Case demonstrates the achievability of implementing the Preferred Option (Option B: Catalyst – Targeted Services) and summarises arrangements for successful delivery.

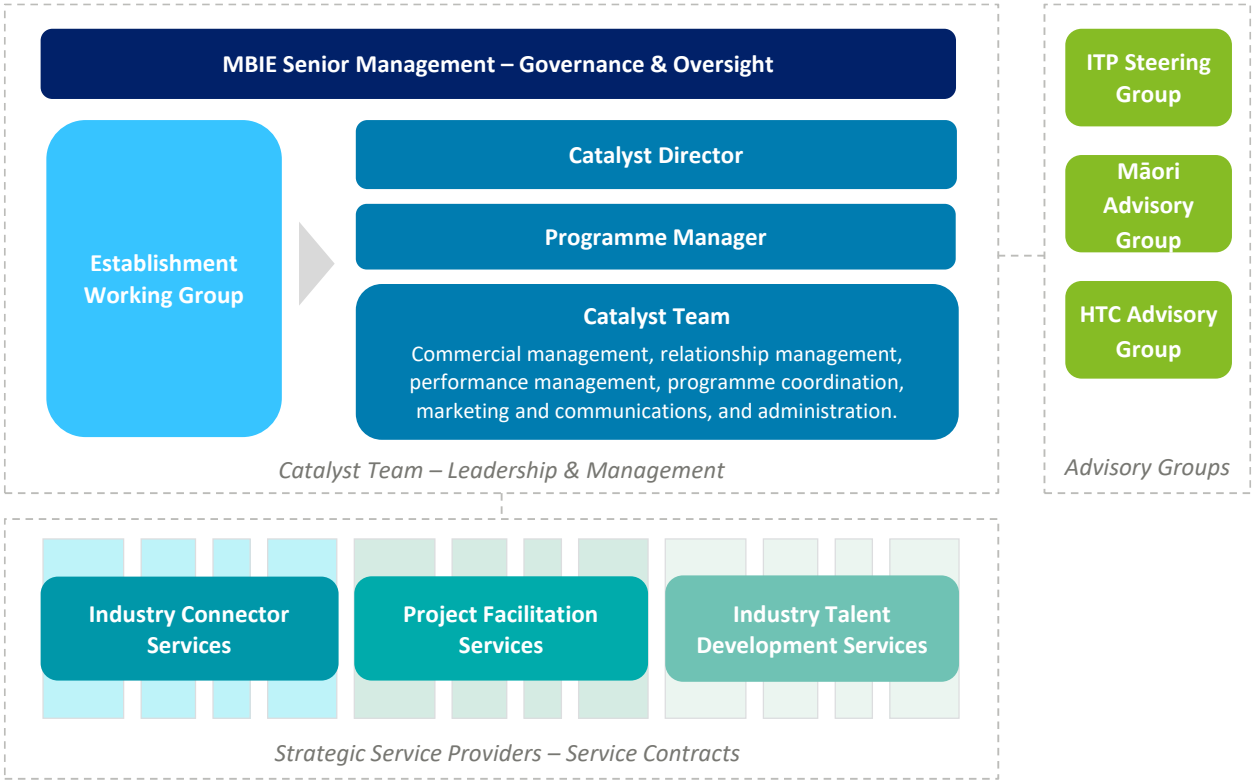
### Catalyst Governance, Management & Delivery Structure

The Catalyst project structure is designed to ensure decisions are made at the appropriate level and provide continuity through the establishment and delivery of the Catalyst. The Catalyst management roles are as follows[8]:

- The ITP Steering Group will set the long-term strategic direction for the ITP, including the Catalyst.
- MBIE Senior Management provides governance and oversight for the Catalyst and holds ultimate accountability for the Catalyst's operational and financial decision making. MBIE Senior Management delegates operational decisions to the Catalyst Director, who in turn delegates to the Programme Manager.
- The Establishment Working Group (EWG) will comprise key officials and project staff from MBIE and ITP partner agencies. The EWG will operate into the establishment phase of the Catalyst and is responsible for standing up the Catalyst. Once recruited, the Catalyst Team will replace the EWG.
- The Māori Advisory Group provides appropriate Māori representation on the needs and future shape of agritech.
- The HTC Advisory Group provides broad industry representation to the Catalyst.

[8] Refer Appendix 9 for a summary of operating model refinements since the Indicative Business Case

**Figure 6: Catalyst governance and management structure**



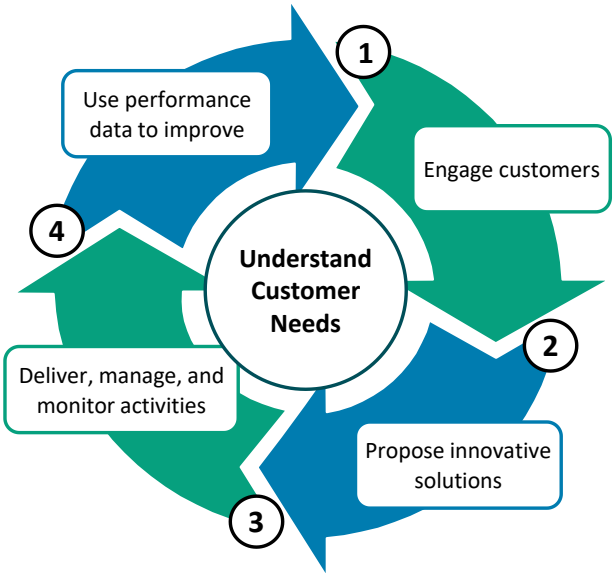

## Catalyst Service Design & Life Cycle Management

The following diagram shows the process to support planning of Catalyst activities to deliver, prioritise and refine over time through ongoing feedback and impact assessment.

**Figure 7: Catalyst service design process**

| | |
|---|---|
| 1 | Through collaboration and engagement with key industry participants, the Catalyst team will better understand the most important and unmet needs of its customers |
| 2 | The Catalyst management team will work collaboratively with Strategic Service Providers and partner agencies to design activities that provide innovate and long-term solutions to the needs of its customers |
| 3 | Delivery of Catalyst activities will involve continual management and monitoring to optimise achievement of outcomes |
| 4 | Performance data and impact assessment will give insight into what activities need to be adjusted, added, or removed from the Catalyst |

This process will be continual, meaning constant refinement of the Catalyst through ongoing feedback and impact assessment.

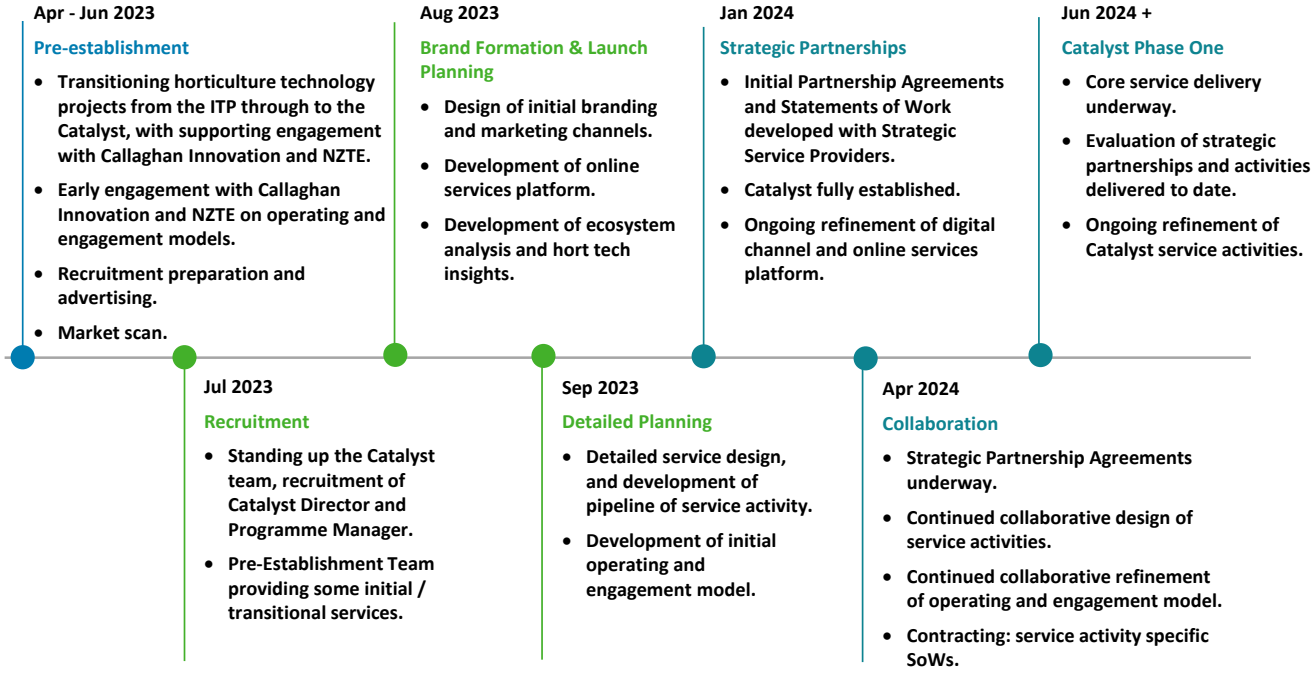


## Project Plan

The project plan is structured across three phases: pre-establishment, establishment, and operations.

Pre-establishment follows endorsement of this Business Case and approval of funding, with full establishment and operating commencing in July 2023 with the receipt of funding. Establishment is anticipated to be complete by the end of 2023, with the Catalyst in full operation from January 2024.

**Figure 8: Project Plan Timeline**




## Māori Engagement

Horticulture has long been a central part of the Māori economy. Māori are important players in the horticultural sector, contributing significantly to New Zealand's economy.

Throughout the development of the business case and design of the Catalyst, the Māori Advisory Group has provided valuable Māori representation on the needs and future shape of horticulture technology.

While the ITP's detailed approach to Māori engagement is still being developed, considerations around the approach to engaging on Catalyst's services and activities are currently being worked through. Areas for further exploration for the ITP, and which could form a blueprint for Māori engagement include:

- Increasing opportunities for partnership between Māori agribusinesses and agritech businesses, and indigenous to-indigenous ventures
- Identifying future-focused Māori agribusinesses and collectives interested in utilising technology to building the knowledge base of Māori in the food and fibre sector
- Supporting Māori skills development through technology to encourage workforce opportunities and increase subject matter expertise across Māori trusts and agribusinesses
- Supporting the understanding and transfer of Māori agribusiness (including mātauranga Māori / Māori knowledge systems) across the sector
- Promoting Māori excellence in the Agritech sector.

# 2 Strategic Case

## 2.1 Background

*New Zealand has an opportunity to grow a world-leading horticulture technology sector rooted in domestic expertise and accelerated by international opportunity*

### The plan to transform the agritech industry

The Horticulture Technology Catalyst is a high impact project under the Agritech Industry Transformation Plan (the ITP) and is a cornerstone of its vision and direction.

Launched in July 2020, the ITP sets out an approach for the long-term transformation of the agritech sector to make it more productive, sustainable, and inclusive as part of a net-zero carbon economy. Its recent refresh has set out a vision to grow the economic contribution of New Zealand's agritech sector to $8 billion by 2030. The agritech sector's growth is closely linked to and will support the Fit for a Better World roadmap for our food and fibre sector.

The ITP is a shared vision between Government and industry to develop a world-leading smart agritech ecosystem. The ITP's aim is to accelerate growth through the following areas:

- Enabling company growth by ensuring business capability services are provided consistently and well
- Building skills for diversity and growth, and ensuring effective coordination with the education sector
- Enabling a smart ecosystem through collaboration that attracts international interest
- Increased Māori interests and participation that ensure Māori aspirations are realised
- Building a supporting and patient investment environment suited for agritech
- Increasing global connections for growth to build a globally connected sector.

Following the ITP refresh in late 2022, the Catalyst remains a high impact project key to the ITP's success. The aim of the Catalyst is to help grow the agritech industry's export offering while benefitting the horticulture industry. As a beacon for collaboration, it will help to overcome the issues of scale, emphasise a global focus and ensure New Zealand innovators and entrepreneurs can lead the world in this space.

While New Zealand's horticulture is small in the global scale, it is a significant sector of our economy and open to adopting technology, making it an ideal testbed for developing horticulture technologies. New Zealand's climate means that we can grow most crops commercially, and being off-season to the Northern Hemisphere provides the opportunity to develop our attraction as a platform for testing new technologies.

#### Indicative Business Case endorsement

In April 2022, Cabinet endorsed the indicative business case (IBC) for the Horticulture Technology Catalyst and directed the development of a detailed business case (DBC).

Key parts of the Catalyst's proposed services – detailed in the Economic Case – are being piloted as part of DBC development, validating the need for the support the Catalyst can provide:

- **Industry Connector**: Pilots include taking New Zealand horticulture technology companies to overseas events and networking trips, and bringing overseas parties to New Zealand. Domestically, pilots have been aimed at building connections and bringing key parts of the agritech ecosystem together.
- **Industry Talent Development**: Pilots are focused on building key business skills in our horticulture technology sector, and developing local talent through support and placement programmes for students and Māori.

## 2.2 Strategic context

### The food and fibre sector is a significant part of New Zealand's economy

*Food and fibre exports make up the majority of New Zealand's exports, contributing 81.4% of merchandise exports.*[9]

New Zealand's food and fibre sector is an important export sector, producing enough food to sustain an estimated 40 million people per year.[10] New Zealand is recognised as a high-quality producer in key export markets across Australasia, Europe and Asia and, as the table on the following page shows, New Zealand is known for more than just its dairy exports - its fruit and vegetables can command export premiums and are growing as an export earner. In 2022, food and fibre exports exceeded $53 billion, up 11% on the previous year.

Diverse climatic regions, including subtropical, high-fertility, hill country, dry arable, cold intermontane / high altitude grassland and mountainous land means New Zealand can export a range of agriculture and horticulture produce to the world.

Cutting-edge technologies have delivered efficiency improvements and revenue growth, meaning New Zealand farmers and growers can stretch inputs and increase yields, while ensuring the highest standards of quality continue to be met.

On the back of shifting dietary preferences and increasing environmental awareness in developed markets, there is a pressing need for further developments to address labour shortages, food safety, sustainability and traceability issues within supply chains. Increasing interest and uptake of plant-based diets and products, and the need to build resilience into critical food systems, means horticulture technology has a growing role to play in supporting the former and alleviating the challenges of the latter. New Zealand technology companies, backed by a strong government mandate to build an export sector around such innovation, are well placed to deliver these solutions.

#### What role does technology play in the food and fibre sector?

The New Zealand Agritech Story's Market Insights report (July 2019) showed those in the agritech industry and wider agriculture sector in the key markets of Australia, the United States of America, Canada, Ireland and the United Kingdom viewed New Zealand's agritech as a key enabler of New Zealand's strong reputation for food and fibre excellence.

Yet there are shortcomings. New Zealand's distance from markets, its (by global standards) small agritech industry, and difficulty in securing strategic investment all weigh against the country's ability to amplify its reputation as a hub for commercialising agritech.

New Zealand's strength in food and fibre production and innovative ability represents an opportunity to establish agritech as a high-value export sector, while supporting increasing the productivity and sustainability of the New Zealand food and fibre sector. This opportunity is the primary reason for the Agritech Industry Transformation Plan, which aims to support the sector's ambition to establish itself as a key economic driver for New Zealand.

The ITP places an emphasis on technologies in which New Zealand both has a competitive advantage, and which can be scaled and exported globally.Given the scale of this sector, it is important to make target investment in specific subsectors such as horticulture, to ensure they are able to capitalise on local and global markets and reach their potential.

[9] New Zealand food and fibre exports leap to a $53.3 billion result | Beehive.govt.nz
[10] Sustainable food supply NZ G2G - Sustainable food supply | NZTE

## Horticulture is a high-value target industry within the food and fibre sector

Horticulture is an important part of the New Zealand economy, growing strongly in recent years. Exports from the sector reached $6.8 billion in 2022 and are projected to grow $7.7 billion in 2024.[11] According to Horticulture New Zealand, the sector is also well placed to help New Zealand reduce its emissions, while also enabling the economy to grow. There is a strong value proposition to support additional growth for the sector through the utilisation of horticulture technology, with significant opportunities in areas such as automating operations.

The scale of the Horticulture sector is highlighted below, using exports as the basis for comparison, and illustrates how material it is to New Zealand's economy.

**Table 7: New Zealand food and fibre sector export statistics ($m)**

| Sector | 2021 | % Total | 2022 | % Total |
|---|---|---|---|---|
| Dairy | 19,093 | 40% | 21,998 | 41% |
| Meat & Wool | 10,391 | 22% | 12,310 | 23% |
| Forestry | 6,531 | 14% | 6,578 | 12% |
| Horticulture | 6,622 | 14% | 6,782 | 13% |
| Seafood | 1,772 | 4% | 1,919 | 4% |
| Arable | 260 | 1% | 252 | 0% |
| Processed food and other | 3,112 | 7% | 3,226 | 6% |
| **Total exports** | **47,780** | **100%** | **53,065** | **100%** |

Source: MPI (December 2022)

### What is Horticulture?

For the purposes of this business case, Horticulture includes crops that are:

- Grown in or on the ground (e.g. strawberries, berries, vegetables)
- Grown on the vine (e.g. grapes, kiwifruit, berries)
- Grown on the tree (e.g. pip and stone fruit, nuts)
- Wine (i.e., processed grapes)

Arable crops are excluded from this definition.

Significant horticulture crops in New Zealand include wine grapes, vegetables and fruit (kiwifruit, apples and pears, stone fruit, citrus fruit, and avocados).

## Why support the growth and innovation of horticulture technology?

Horticulture across the world is facing challenges such as labour availability, adapting to climate change, and strengthening consumer preferences for safe food and traceability requirements for these preferences. Technological innovations can help to address these challenges and improve productivity in horticulture. For example, mechatronics and automation can supplement or replace labour requirements, while sensing technologies can increase efficiency and improve sustainability, particularly in areas like nutrient management for plant health. It can also create operational efficiencies and provide solutions for food safety, traceability, and improving work health and safety.

Ultimately, horticulture technology can help build resilience in critical food systems. International events, including recent events in Ukraine, can expose the vulnerability of these highly people-dependent sectors in times of crisis. More recently and with greater impact domestically, the aftermath of Cyclone Gabrielle has

[11] Situation and Outlook for Primary Industries | NZ Government (mpi.govt.nz)

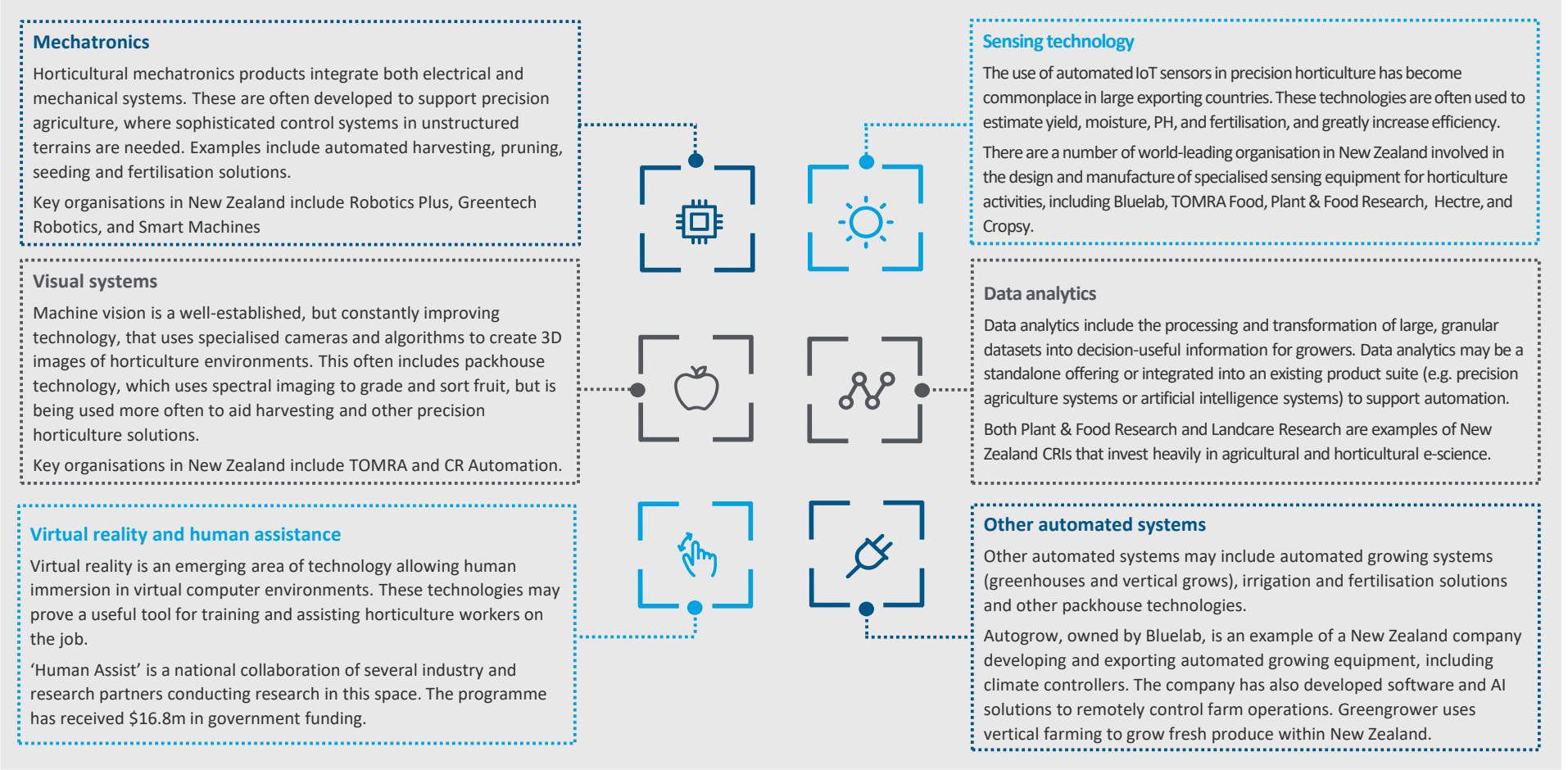
highlighted the vulnerability of current horticulture production systems and the resilience of our overall food system in the face of a changing climate. A huge challenge lies ahead for New Zealand, rebuilding a sector, which has been decimated in our key regions. The time and opportunity now, to rebuild a stronger horticulture ecosystem, underpinned with excellent horticulture technology will be important to support our domestic production system in improving climate related resilience

## What is horticulture technology?

Horticulture technology is more than just irrigation systems. New Zealand technology companies are developing a wide range of automated, genetics and software solutions intended to integrate with precision horticulture systems and add value post-harvest.

New Zealand has the skills and capability to be a world player. What it needs is government backing to scale, and support to activate the existing potential, foster talent and commercialisation opportunities.

**Figure 9: Horticulture technology types**



## Examples of companies developing and manufacturing horticulture technology in New Zealand

**Figure 10: Companies developing and manufacturing horticulture technology**

| | |
|---|---|
| **Mechatronics** | *Robotics Plus* specialises in automated robotics systems such as robotic fruit pickers, fruit packers, and unmanned ground vehicles (UGVs).<br>*Frost Fans* designs and manufactures frost protection solutions, including fans and fan monitoring systems. |
| **Visual systems** | *TOMRA Fresh Food* specialises in advanced vision sorting and packing equipment.<br>*Wyma Solutions* designs and manufactures post-harvest fruit and vegetable equipment, including for handling, washing and sizing. |
| **Sensing technology** | *Bluelab* develops devices that measure, monitor and control key variables in controlled environment growing systems.<br>*Cropsy* specialises in AI-driven vineyard monitoring for solutions including early detection of pests and diseases, managing crop loss, and estimating yield. |
| **Data analytics** | *Rezare Systems* creates custom software solutions and operates an agricultural data permissions and insights platform.<br>*CropX* develops hardware and software systems to aggregate farm data and transforms it into decision-useful information. |
| **Virtual reality and human assistance** | *MaaraTech Human Assist* is a collaboration of research institutions and companies creating a suite of AI and augmented reality tools designed to help workers make better and more consistent decisions.<br>*AI Forum* is a not-for-profit organisation conducting research on areas such as the impacts that artificial and augmented intelligence could have on the agriculture industry in New Zealand. |
| **Other automated systems** | *Autogrow,* owned by *Bluelab,* specialises in automated growing solutions for greenhouse, tunnel house and grow room growers.<br>*Greengrower* grows sustainable fresh produce through use of their large-scale vertical farm. |

## The importance of horticulture technology

The ITP places an emphasis on technologies in which New Zealand both has a competitive advantage, and which can be scaled and exported globally. As noted earlier, horticulture technology is one such area for New Zealand – there is existing domestic strength, capacity for further growth, and a significant international opportunity to export at scale.

This is outlined in detail in the following sections.

## Strategic alignment – how will this investment help deliver on key priorities?

### Government's economic plan

**Table 8: Key economic shifts**

| Key economic shifts needed | How could the Catalyst enable this? |
|---|---|
| **Unleash Business Potential**<br>Delivering the productivity gains that will drive a high-wage, low-emissions economy requires significant innovation among all our businesses, from our small to medium business to large industries. | The Catalyst will accelerate the growth of the horticulture technology sector, which is innovative, high-wage, and low-emissions. |
| **Strengthen International Connections**<br>Deepening our connections with global centres of knowledge and innovation including through the university and science system, enhancing capital flows, and attracting skills | The Catalyst will intentionally build stronger international relations between the domestic horticulture technology sector and international growers, investors, and collaborators. New Zealand firms often struggle to access strategic capital, and there is a role for the Catalyst to match domestic and international investors with innovators. It could also provide access to overseas investment trends and insights, helping local firms understand the opportunities available by taking a global focus from day one.<br>The Catalyst will bring opportunities for 'on the ground' international placements of key industry representatives who can facilitate collaboration and build stronger connections between international and domestic stakeholders. |
| **Increase Capability & Opportunities**<br>Delivering quality education, training and upskilling, so all New Zealanders, regardless of where they live, have the capability and opportunities they need to live the lives they value | The Catalyst presents opportunities for skilled people to contribute to horticulture technology. It could also facilitate placements for university students within organisations and collaborative projects, opening up pathways for skills development and, potentially, careers in horticulture technology. |
| **Support Māori and Pacific Aspirations**<br>Partnering with Māori and Pacific business and people to deliver on their aspirations through leveraging their unique strengths and demographic potential. | Horticulture is a rapidly growing share of the Māori economy. While only 5% of total horticultural land is owned by Māori entities, around 9% of kiwifruit land is in such ownership. With opportunities to enable and expand Māori/iwi horticultural operations, the Catalyst could contribute directly by helping with access to skills, innovation and capital. The Catalyst could also create clearer pathways for Māori talent development by ensuring strong representation and voice within the initiative. Given the importance of Pacific people to the Government's economic plan, there are opportunities to work with Pacific communities to understand how they can benefit from the Catalyst. |

| Key economic shifts needed | How could the Catalyst enable this? |
|---|---|
| **Strengthen Our Foundations**<br>Investing in quality, future-focused infrastructure and institutions will provide the foundations that support high-wage jobs and a sustainable, climate resilient economy. | New Zealand's agritech sector has supported the country's food and fibre sector to be internationally recognised. The Catalyst will be an institution that contributes to a more diversified economy through the growth of the horticulture technology industry, as well as stronger resilience and better climate adaptation in the horticulture industryThe opportunity now, following the recent events of Cyclone Gabrielle highlights the need for excellence in horticulture technology to support the rebuild of the sector. |

### Productivity Commission on Frontier Firms

The Catalyst is further aligned with recommendations from the Productivity Commission's commission into Frontier Firms, which found that New Zealand must intentionally focus investment on a few innovation ecosystems. The Commission recommended that Government focus on areas of the economy with rich potential for innovation. Overall, this inquiry recommended that Government investment should be focused on areas of existing or emerging economic strength and competitive advantage, as a small country can excel in only a limited number of areas that can get to critical mass and support sustained world-class competitive performance.

Given the Catalyst's strongly targeted support and aims, it aligns well with these recommendations. Its relatively narrow focus on a high-potential and highly innovative area of the economy will allow the Catalyst to maximise its impact by working more intensively to cultivate a smaller ecosystem than a broader, less-targeted approach would permit.

### Te Ara Paerangi – Future Pathways

The development of the Catalyst has also been informed by Te Ara Paerangi – Future Pathways, and is aligned with its direction. Te Ara Paerangi aims to create a modern, future-focussed research system for New Zealand, which is adaptable for a rapidly changing future, resilient to changes, and connected; to itself, to industry, to public sector users of research, and internationally. The Catalyst particularly aims to address issues of connection between research and businesses. Core to the Catalyst's mission will be to connect existing ecosystem players better, building relationships and partnerships that allow the horticulture technology sector to build to a highly focused innovation ecosystem. In doing so, it may be able to inform the work of Te Ara Paerangi as its work programme continues.

### Fit for a Better World[12]

In July 2020 the Government released the food and fibre sector roadmap, Fit for a Better World: Accelerating our Economic Potential. The roadmap sets out three ambitious targets to achieve a more productive, sustainable, and inclusive economy within the next decade.

- **Productivity:** Adding $44 billion in export earnings over the next decade through a focus on creating value
- **Sustainability:** Reducing biogenic methane emissions to 24–47 percent below 2017 levels by 2050 and 10 percent below by 2030. Plus, restoring New Zealand's freshwater environments to a healthy state within a generation
- **Inclusiveness:** Employing 10 percent more New Zealanders by 2030, and 10,000 more New Zealanders in the food and fibre sector workforce over the next four years

Horticulture is a major sector contributing to the success of this initiative, particularly given its export exposure is significantly more distributed than other food and fibre sectors. The June 2022 progress report highlighted this and specified its actions for the year ahead:

- Complete the business case for the Plant Health lab site and undertake concept design

[12] Fit for a better world 2022 Primary sector roadmap to boost export earnings | NZ Government (mpi.govt.nz)

- Continue the seven-year Sauvignon Blanc Grapevine Improvement Programme managed by Bragato Research Institute, in collaboration with New Zealand Winegrowers and more than 20 wine sector companies
- Continue variety and rootstock trials and breeding programme for crops such as berries, kiwifruits, apples, summer fruit and some vegetables.

**Aotearoa Horticulture Action Plan**

The Aotearoa Horticulture Action Plan has been developed by industry, Māori, research providers and government to ensure the commercial horticulture sector meets its target of increasing grower returns and achieving $12 billion in revenue by 2035.

The Catalyst will help deliver on its core outcomes, including growing sustainably, optimising value in the horticulture sector, and supporting Māori participation in high-value horticulture, as well as key priorities such as optimising use of agritech across New Zealand's horticulture sector.

### Recommendations to accelerate commercialisation in New Zealand agritech

The Horticulture Technology Catalyst strongly aligns with a 2021 report commissioned under the ITP to canvass gaps in the NZ agritech ecosystem. It had a particular focus on issues in the investment and commercial-related aspects of the ecosystem, identifying responses to these issues and opportunities that they present.

The report recommends:

- Investing in skills, especially the early-stage commercial expertise surrounding young companies
- Fostering a culture of collaboration through the development of specialised clusters of excellence around areas of advantage (e.g. robotics)
- Reconfiguring the top of the agritech funnel to ensure that R&D funding criteria have greater alignment with international markets and customer needs
- Improved coordination and oversight of government business funding and financing programmes to target funding gaps with innovative, scale mechanisms.

## 2.3 The case for change

The Industry Reference Group agreed New Zealand has an opportunity to grow and accelerate a world-class horticulture technology export industry. Support and investment are needed to achieve this.

With a strong but fragmented technology talent pool in New Zealand, a network of CRIs and independent research institutions, incubators and university-led commercialising hubs, and an industry seeking assistance to some of its most pressing problems – in an environment vastly different to when the Agritech ITP was under development, pre-Covid – stakeholders have been clear: the Catalyst must not duplicate or further fragment the current eco-system.

Rather, it must be additive, and act as a connector and integrator for all facets of the sector, including growers, technology companies, and research institutions.

### What are the key challenges in the horticulture sector that technology can help address?

*The industry needs support to foster innovation and commercialisation opportunities, ultimately helping the horticulture sector overcome current market challenges.*

There are key challenges and megatrends affecting the horticulture sector, which form the foundation for the need for investment and change. Rising population growth and resulting food demand, environmental concerns and labour challenges are currently powering the need for technology solutions.

**Figure 11: Key drivers**


## Global volatility

The horticulture technology sector can assist with both the domestic horticulture sector's resilience and ability to adapt to global demands, and with overseas producers' requirements, particularly in light of the uncertainty that conflict and an inflationary environment can engender.

The current global inflationary environment is also driving the need for technology to make operations more cost-effective, with annual inflation running at 7.2 per cent in the September 2022 quarter, which includes a 10.2 per cent increase in grocery food costs.[13] New Zealand growers buy in the global market and feel the impact of international price impacts. The United Nations Food & Agriculture Organisation's Food Price Index showed commodities hitting all-time highs in March 2022[14] and, while prices have been trending down to November 2022, current and changing climatic conditions and global instability (including the ongoing Russian invasion of Ukraine) are keeping prices elevated.

Ukraine, one of the world's largest exporters of wheat, saw its ports blocked and the global wheat price sky-rocketed. Key inputs to horticulture, including fertiliser and fuel, have significantly increased in price due to the invasion, which were already rising before.[15]

For the food and fibre sector and agritech, this collectively means:

- horticulture will continue to be an attractive business venture and growers will continue to look for ways to innovate and expand their operations; and
- the ongoing increase of underlying operational costs from inflation and other recent, global events justifies the need for more cost-effective, technology-based solutions to support business operation efficiency.

## Climate change

Climate change, highlighted moste recently in the aftermath of Cyclone Gabrielle, forces innovation to help develop a horticulture sector resilient to rising sea levels, increased frequency of severe weather events, heat stress, and new and different pests and diseases. For example, local company Hectre's technology helps growers to mitigate the environmental impacts of operations through effective and efficient management of pesticides and other chemicals used in horticulture, and has recently completed a $3.5 million capital raise.

Horticulture technology that increases the efficiency of the industry will be needed as New Zealand rebuilds a sector which has been severely impacted, and moves towards regulating agricultural emissions, and consumers, governments, and private companies around the world demand more from their suppliers and growing communities. Pricing agricultural emissions in New Zealand, while largely focusing on biogenic methane, also captures growers through fertiliser use.[16] The proposed farm-level pricing scheme will see growers needing to provide information on sequestration and adoption of mitigation technologies, which would impact their levy payment. Even without government intervention, growers would likely need to comply with standards

[13] https://www.beehive.govt.nz/release/inflation-eases-amid-volatile-global-environment
[14] https://www.fao.org/worldfoodsituation/foodpricesindex/en/
[15] https://www.stuff.co.nz/business/farming/128974673/fertiliser-prices-increase-by-as-much-as-25
[16] https://environment.govt.nz/publications/pricing-agricultural-emissions-report-under-section-215-of-the-climate-change-response-act-2002/

implemented overseas. Tesco is introducing sustainability standards requiring environmental accreditation for produce[17] – which means local and international suppliers would need to demonstrate compliance.

The contraints of a changing environment are not just felt by growers and farmers in New Zealand. In California, the worst drought in 1,200 years is threatening the state's fruit-growing industry. There is also contamination of drinking water, due to nitrates and pesticides.[18]

In addition, changing climatic conditions means not only new cultivars are required, but also better, more sophisticated technology to reduce reliance on inputs, and to ensure crops are grown, handled, harvested and packed efficiently with limited waste and damage.

### Labour shortages & costs

Talent and labour shortages in a range of sectors in New Zealand – including both horticulture and technology – have been acute, due to closed borders and an overall increased demand for labour across the globe. The horticulture sector continues to experience a shortage of overseas seasonal labour, on which so much of the sector relies to get fresh goods to market. Current labour shortages in the horticulture sector are estimated at around 10,000.[19]

Businesses in the horticulture sector are increasingly challenged to find employees willing and able to fulfil requirements. The sector requires additional labour to support planting and harvesting processes. The seasonal nature of labour only compounds current challenges. Inventions like Robotics Plus' hybrid vehicle, which automates manual jobs, like spraying and pruning, reduces the need for machine operators and also provide data-driven insights for informed decision-making.

Closed borders and travel restrictions have impacted the sector, which relies heavily on international workers to provide seasonal labour. Seasonal work is generally performed by Kiwis, backpackers and workers under the Recognised Seasonal Employer (RSE) scheme, but the latter two experienced travel limitations to New Zealand as a result of Covid-19 border restrictions. This contributed toward significant loss in crop, with 2021 apple and pear exports down by 6%.[20] Labour is therefore a major constraint on the sector's growth potential, with the Horticulture NZ Chief Executive, Nadine Tunley, stating that the continued growth trajectory will not be achievable without sustainable investment in people.[21] The NZIER Quarterly Survey of Business Opinion (QSBO) for 2023 found that finding labour remains the top primary constraint for businesses in New Zealand.[22] This, in addition to an increasing regulatory and compliance burden has served to increase the cost of labour.

Responses to labour shortages are being seen around the world. For example, Western Growers (group representing US farmers) is proposing a Global Harvest Automation Initiative to accelerate harvest automation across the fresh produce industry, with a goal of automating 50 percent of harvest within 10 years. This is in response to the dwindling worker numbers and the movement of fresh produce operations to other countries.

Labour shortages, and its increasing costs, is a key driver in the need to create and adopt technology solutions in the sector. Automation of traditionally laborious activities like harvesting reduce the reliance on unskilled and overseas labour. For example the University of Waikato has recently developed an electronic fruit bin to assist in kiwifruit pickers by carrying their bins.[23] Technology adopted into horticulture will also require more skilled jobs to work and service them, attracting more people into the workforce.

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[17] Tesco's warning to New Zealand farmers | Stuff.co.nz
[18] https://www.forbes.com/sites/chloesorvino/2022/09/22/california-farms-pump-water-to-feed-crops-amid-extreme-heat-and-drought-but-residents-wells-are-running-dry/?sh=6d25bacf6eac
[19] Labour has been the common issue at our AGMs (pg4-5) NZ Grower I October 2022 by Horticulture New Zealand – Issuu
[20] MPI, Situation and Outlook for Primary Industries, December 2022
[21] Hort NZ, Chief Executive update, 8 June 2022 Stepping towards a sustainable workforce | Horticulture New Zealand — Ahumāra Kai Aotearoa (hortnz.co.nz)
[22] QSBO shows business sentiment and activity taking a turn for the worse - Quarterly Survey of Business Opinion, January 2023 (nzier.org.nz)
[23] SunLive - Tackling the horticulture labour shortage in NZ - The Bay's News First

Like other sectors in New Zealand, horticulture has seen rising input costs. In the previous year, fuel cost for horticultural farms has increased 6 per cent, fertiliser costs by 38 per cent, weed and pest control costs by 20 per cent, with overall farm expenses, measured through the farm expenses index (FEPI), rising 15 percent.[24]

To help mitigate labour shortages, more sophisticated technology is needed to reduce reliance on inputs, and to ensure crops are grown, handled, harvested and packed efficiently with limited waste and damage.

### Changing workforce demographic

Workforce demographics and cultures are changing. As the New Zealand workforce becomes relatively more diverse, workforce aspirations and expectations also change. Many countries are finding that fewer young people are interested in working in farming and horticulture. Growth in the horticulture technology industry would create highly-skilled jobs that provide long-term development opportunities and job satisfaction. As horticulture technology is adopted into the horticulture industry, more attractive and long-term careers jobs in horticulture will be created that can further benefit the New Zealand workforce.

### Food safety and traceability

There is a growing desire for "safe" and "natural" foods. Traceability has become important to some consumers, knowing where the products have come from, how they are produced and how environmentally friendly and sustainable the organisation's operations are. Consumers are increasingly wanting pesticide residue-free products. Some markets are moving towards shorter, more transparent, supply chains, which New Zealand producers will want to be a part of. Given New Zealand's remote location, this process will require deliberate and careful planning as well as flexibility where changes in the world may affect these plans.

Due to the global scale of these changes horticulture technology will play an important role in food safety and traceability worldwide. For example, vertical grows in controlled environments can eliminate the need for pesticides, and automated systems can shorten supply chain timeframes.

### Changing consumer preferences

As the size of the middle class increases globally, consumer preferences are shifting away from basic nutrition towards healthy and convenient food. Increasing demand for high nutrition foods, and products tailored to individual preference of nationalities, is driving a change towards convenient meals, food packaging and business models. New cultivars developed through research and development in New Zealand – like in apples (Envy, Rockit) and kiwifruit (Gold, Ruby Red) – are attracting export price premiums. Product ranges are becoming complex as producers, manufacturers, and supermarkets aim to meet changing consumer preferences.

Globally, there is an opportunity for New Zealand horticulture technology to assist companies existing along different stages of the supply chain.

### Health and Safety (H&S)

The use of technology in the workplace can help protect workers from dangers relating to using machinery and reduce exposure to hazardous substances. While workplaces need clear H&S measures and rules in place for safe operation of machinery, automating processes has the potential to help prevent workplace injuries or adverse health effects such as musculoskeletal disorders. In Marlborough, Smart Machine has developed the Oxin autonomous vehicle to work in vineyards, which takes on tasks such as mulching, mowing, leaf removal and trimming, with greater precision, sustainability and safety across vineyards operations.

[24] https://www.stats.govt.nz/information-releases/business-price-indexes-september-2022-quarter/

## The opportunity to support the growth of innovative horticulture technology solutions

*The current environment provides a unique opportunity to strengthen and support New Zealand's horticulture technology industry.*

As mentioned above, there are a variety of challenges within horticulture that are driving a rising demand for innovative technology to improve productivity, enhance sustainability, traceability and reduce concerns around labour shortage and escalating costs. As the market gains further awareness of technological advancements, it becomes the logical starting point for making improvements.

- ✓ **There is interest and demand in both the domestic and global markets**

Currently growers are striving to produce more food or product, at a higher quality, in a more sustainable and traceable way. This is because around the world, growers are seeking solutions to challenges similar to those faced by New Zealand growers. All over the world, farming nations are looking to innovative solutions to ensure production is not hampered by resource constraints. The governments of countries including Ireland, Israel, Singapore, and the United Kingdom are all supporting or incentivising agritech adoption and market growth. By lifting our eyes to international grower problems early on in technology development, New Zealand has the opportunity is to solve international and domestic grower challenges.

There have already been a range of success stories in the local horticulture technology sector, including Greentech Robotics' WeedSpider – with large exports to Californian growers – and Bluelab, which develops components for climate-friendly controlled-environment agricultural systems.

> *"When you look at the scale issue, New Zealand has a very large operating environment. It has a long history of investment through Crown Research Institutes, companies and universities, particularly around high-value horticulture, and pastoral farming. Peer investors don't realise how deep that technology capability is."*
>
> - Arama Kukutai, Co-founder and Partner, Finistere Ventures, United States, and CEO of Plenty.
>
> Source: NZ Agritech Story Market Insights Report (2019)

- ✓ **New Zealand has the ability and relationships to make a mark on the global market**

With a healthy and growing industry body in AgriTechNZ, global partnerships with the likes of Western Growers, the Silicon Valley Forum, Farm 2050, and a growing industry reputation, New Zealand can make its mark. There are already successes and international relationships underway: in 2022, AgriTechNZ held a New Zealand – Israel agritech summit,[25] New Zealand and California signed a Memorandum of Cooperation on climate change and subsequently a Letter of Intent to accelerate collaboration in 'smart agriculture'. In November 2022, the Southern Hemisphere's largest agricultural event, Fieldays, was back in full swing, welcoming international visitors keen to see the best of local and global agricultural innovation, with missions from the EU and UK both in attendance.

New Zealand's ability to attract deals and create global events is backed by over 150 years of agricultural innovation and a reputation as a top-quality food producer. And, as a country committed to free trade, market access is a relentless focus. The unsubsidised nature of the country's food and fibre sector means farmers and growers understand the benefits of new technologies and ways of doing things – they aren't beholden to tradition. This is backed up by the country's strong tradition of food and fibre sector research and innovation, found at universities, Crown Research Institutes and in private enterprises.

[25] Israel & NZ: embracing agri-technologies through partnership - AgriTech New Zealand (agritechnz.org.nz)

- ✓ **Māori horticultural interests represent an opportunity**

Māori/iwi interests in the wider food and fibre sector are large and growing. The Māori economy has been growing faster than the wider economy and represented nearly 7 percent of New Zealand's GDP in 2018.[26] Māori business is innovative, often endeavours to incorporate Māori values and has the potential to support wellbeing outcomes in a culturally grounded way.

From an agricultural perspective, Māori and iwi interests have been equally as strong. By the end of 2022, New Zealand's food and fibre exports had risen 39 per cent since 2017.[27] Total exports by Māori businesses grew from $630 million to $872 million over the same period, with the majority from the food and fibre sector.

Māori own around 5 per cent of the country's horticultural land, including around 8 per cent of total land planted for onions, and 9 per cent of kiwifruit.[28] It's estimated around $220 million in gross output is generated through Māori horticultural operations, and nearly 4,000 Māori are employed in the sector – around 17 per cent of the total horticultural workforce.

With such strong interests in the sector, being able to access, use, and participate in the development of horticulture technology is key. Māori have significant potential in the labour force and will comprise around one-fifth of the working-age population by 2043, with 57% of Māori being under the age of 30.[29] This means there is a significant opportunity to support sustainable and productive growth, particularly as technology advances and the employment landscape moves from lower-skilled jobs to higher-skilled industries. Research from the Treasury suggests adapting and using new technologies cannot be underestimated for rangatahi Māori to unlock opportunities to move them into higher-skilled career pathways.[30] In addition, it could increase access and the ability to maintain cultural connections to their whenua.

By incorporating Māori aspirations, the Catalyst can contribute to these opportunities, tailoring and focusing opportunities to those both interested in horticulture technology, and those wanting to benefit their land.

- ✓ **Pacific communities have a role to play**

Pacific communities play an important role in New Zealand's horticulture sector, particularly through the Recognised Seasonal Employee (RSE) scheme. Skilled RSE workers from the Pacific are increasingly relied on by the horticulture and viticulture industries for their growth and export earnings.[31] For RSE workers themselves, the scheme gives the opportunity to make economic gains from the seasonal work, and use their earnings to improve living standards and livelihoods in their home countries, in addition to taking back and teaching new skills.[32]

Greater use of horticulture technology may give RSE participants the ability to further upskill, which could assist with improving horticultural product in their home countries.

While reduced reliance on manual labour is one benefit of horticulture technology, the sheer number of RSE workers required – particularly in New Zealand's tight labour market – means variety and volume of workers required will likely remain high.

[26] Analytical Paper 22/02: Background Paper to Te Tai Waiora: Wellbeing in Aotearoa New Zealand 2022: Trends in Maori Wellbeing - 12 December 2022 (treasury.govt.nz)
[27] Government investment to support growth of Māori businesses and jobs in the primary sector | Beehive.govt.nz
[28] https://www.tpk.govt.nz/en/o-matou-mohiotanga/whenua/maori-in-horticulture-2020-research-report
[29] Analytical Paper 22/02: Background Paper to Te Tai Waiora: Wellbeing in Aotearoa New Zealand 2022: Trends in Maori Wellbeing - 12 December 2022 (treasury.govt.nz)
[30] Analytical Paper 22/02: Background Paper to Te Tai Waiora: Wellbeing in Aotearoa New Zealand 2022: Trends in Maori Wellbeing - 12 December 2022 (treasury.govt.nz)
[31] https://www.immigration.govt.nz/documents/statistics/rse-impact-study-new-zealand-stream-report.pdf
[32] https://www.immigration.govt.nz/documents/statistics/rse-impact-study-pacific-stream-report.pdf

## Now is the right time to bolster the horticulture technology sector

### Consideration of the current economic and fiscal environment

Growing both our agritech and food and fibre sector are essential to both New Zealand's post-Covid economic recovery and future resilience, particularly as the possibility of global recession looms for 2023. As the country re-connects to the rest of the world, it is important its people and products continue to gain access to markets.

Since the launch of the Agritech ITP in 2020 during the Covid-19 pandemic, the domestic and international economies have changed dramatically. Supply chain disruptions throughout 2021 and 2022 were exacerbated by repeated manufacturing shut-downs in China, and the Russian invasion of Ukraine, and these impacts are still being felt.

The global market demand for horticulture technological innovations is strong and increasing due to the challenges facing the horticulture sector, both domestically and globally. Climate impacts are testing the resilience of crops to weather events and disease, labour shortages are impacting harvests, and rising costs are threatening the viability of businesses. In New Zealand, the farm expenses index (FEPI) has risen 15 percent in the year to 30 September 2022,[33] increasing the case for investing in horticulture technology solutions.

### Why the need to tap into the global market, rather than just focus on solving New Zealand horticulture challenges?

Compared to other countries, New Zealand's horticulture technology sector generally comprises relatively small firms, with a few large and internationally successful firms. Those successful firms show the sector can succeed in growing to a large, exporting stage, given the right conditions. However, firms in the horticulture technology sector have a relatively small (compared to international markets) and fragmented horticulture industry to support. There are few opportunities for horticulture technology firms to achieve significant domestic scale, without tapping into global markets and seeking out exporting opportunities. This can be challenging for companies to do unless they have the right support and advice, as well as help making connections and building relationships with key international players.

New Zealand's horticulture technology sector needs international markets for the appropriate level of opportunity to scale up. International connections and partnerships can provide the sector with the critical mass to become a successful and self-sustaining sector. An international outlook is a hallmark of globally successful agritech sectors.

Now is the time to support the horticulture technology sector to drive innovation and help the horticulture sector achieve its ambitious growth plans over the next decade. Without focused support, New Zealand's horticulture technology sector will miss a significant first-mover opportunity for expansion.

### Why must current arrangements change?

New Zealand's horticulture technology sector has significant potential for growth due to a high and increasing global and domestic demand for solutions to issues facing the horticulture sector (e.g. labour availability, climate change adaptation, strengthening consumer preferences). The horticulture technology sector currently has pockets of excellence, but faces constraints that mean the sector's growth is not as strong as it could be:

- The current horticulture technology ecosystem is disconnected, with a lack of relationships between growers, researchers, technology developers, and investors. This is reflected in duplication of efforts and research themes across academia and researchers.
- A shortage of skills for technology companies, particularly graduates with commercial skills. Further, a focused skill development approach is lacking across the sector.
- Research and commercialisation activity could be better connected, with opportunities not pursued and intellectual property (IP) not commercialised due to a lack of access/relevance to or understanding of global markets, limited public and private funding, and scaling challenges.

[33] https://www.stats.govt.nz/information-releases/business-price-indexes-september-2022-quarter/

- Businesses find it difficult to navigate existing public funding and feel there is limited assistance to achieve global scale.

The Catalyst, underpinned by global and local industry intelligence, would play a key role in filling a gap in the current ecosystem by driving collaboration and cohesion across the ecosystem, and facilitating strong regional connectivity.

### What is the connectivity gap in the market the Catalyst will fill?

- **Connect technology companies with growers** – The Catalyst will help provide a detailed understanding of the current makeup and growth of the horticulture technology sector, and enable participants to better understand what the key challenges the horticulture sector is facing and what solutions are already available. Technology companies need to understand pressing issues across various horticulture sub-industries, and growers need up-to-date awareness of what products are available that could make existing operations more effective and efficient.
- **Connect research sector with growers** – The Catalyst's reach into the research community will be to help 'unblock' the problems research close to the market could be facing – in terms of support with project facilitation, and helping to find early adopter growers to test solutions. Providing this connection will give researchers new opportunities to solve commercial issues facing growers today.
- **Facilitate international market relationships** – The Catalyst will assist in connecting both researchers and technology companies in the commercialisation stage, helping to showcase solutions and products to the global economy, providing a channel to the global markets.
- **Connect firms with services and help navigate funding channels** – The Catalyst will bring parties together and provide leadership and support services to enable projects to reach commercialisation critical mass.

**Potential impact**

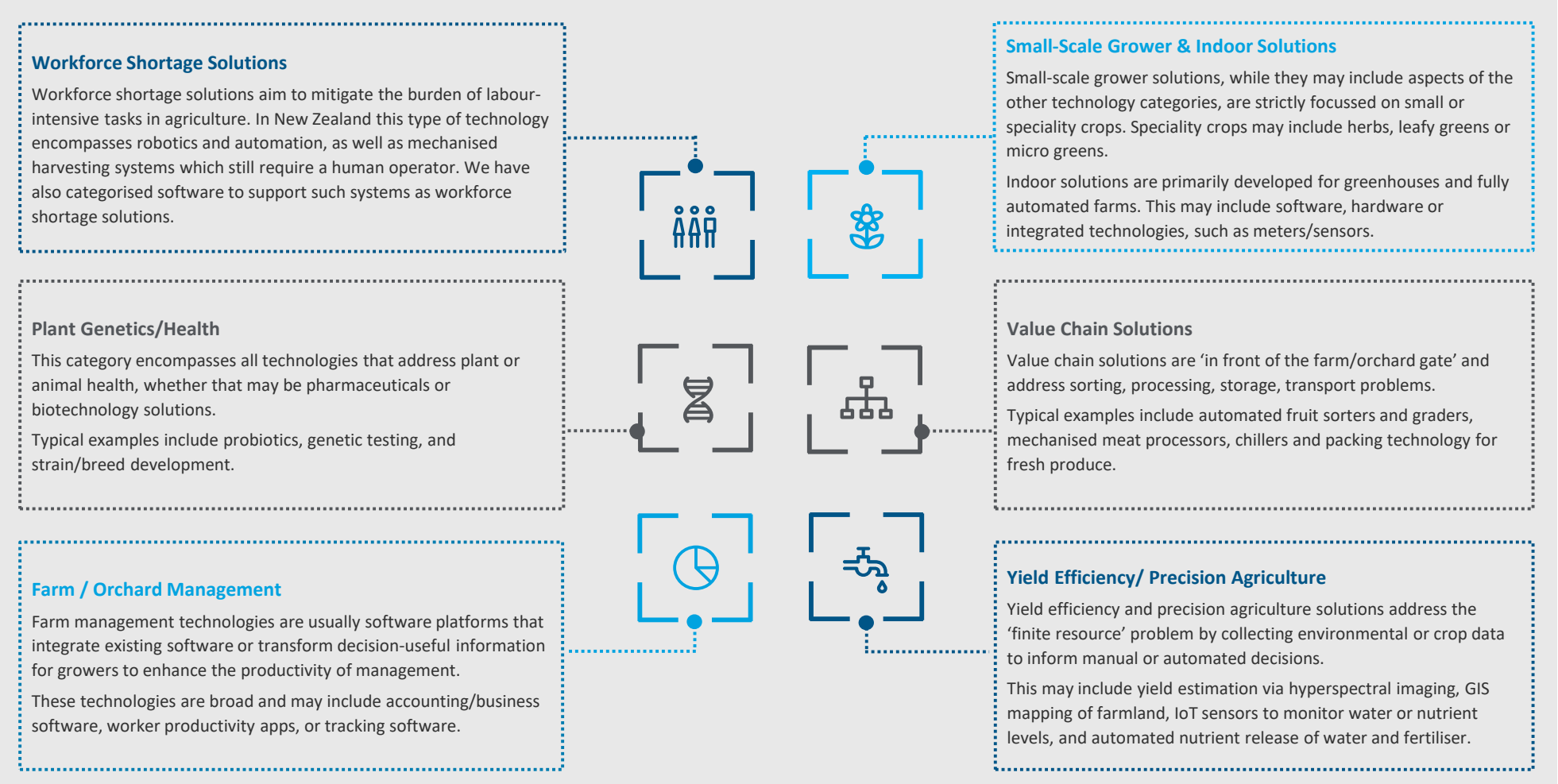
The need for the Catalyst is also supported by the economic impact assessment outlined on page 78, which shows the value to New Zealand the Preferred Option could generate, across GDP impact, export growth and job creation. The CGE modelling indicated that the Catalyst could contribute between $141 – $347 million to national GDP, including $46 – $ 94 million to exports from establishment of the Catalyst until 2035.

Even under the "low" scenario modelled, the Catalyst's potential impact is sizeable ($141 million increase in GDP in present value terms), sufficient to justify its development, and is more than the whole of life cost of the Preferred Option.

## Solution-driven horticulture technology

There are number of different ways technology can be used to improve horticulture production. While pockets of excellence exist in New Zealand, there is a wide range of opportunity types to support the market with.

**Figure 12: Horticulture technology opportunities**

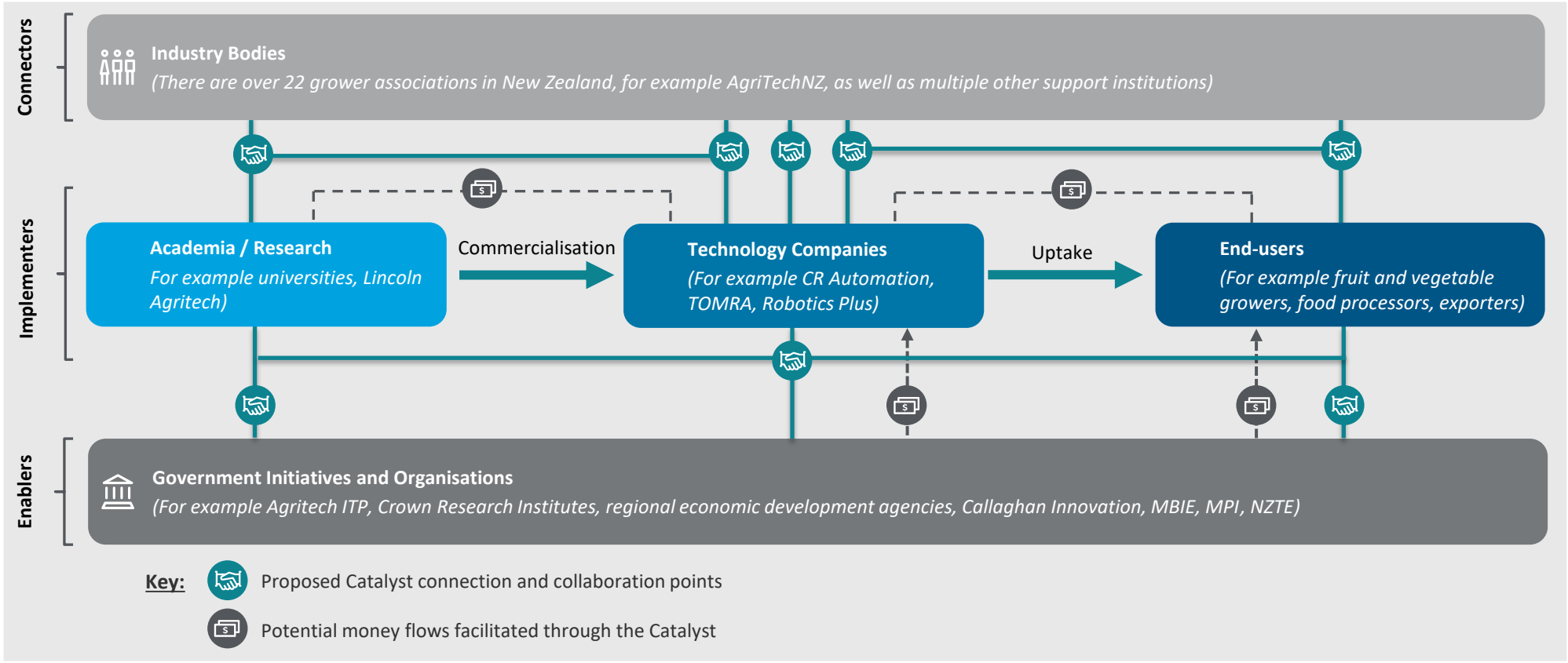


## Connecting The Ecosystem

New Zealand's horticulture technology ecosystem is a combination of implementers, connectors, and enablers. While each plays a clear role in advancing the development of the sector, more could be done to connect these actors.

Illustrated in the figure below, the Catalyst, underpinned by global and local industry intelligence, could play a key role in filling a gap in the current ecosystem by driving collaboration and cohesion across the ecosystem, and facilitating strong regional connectivity.

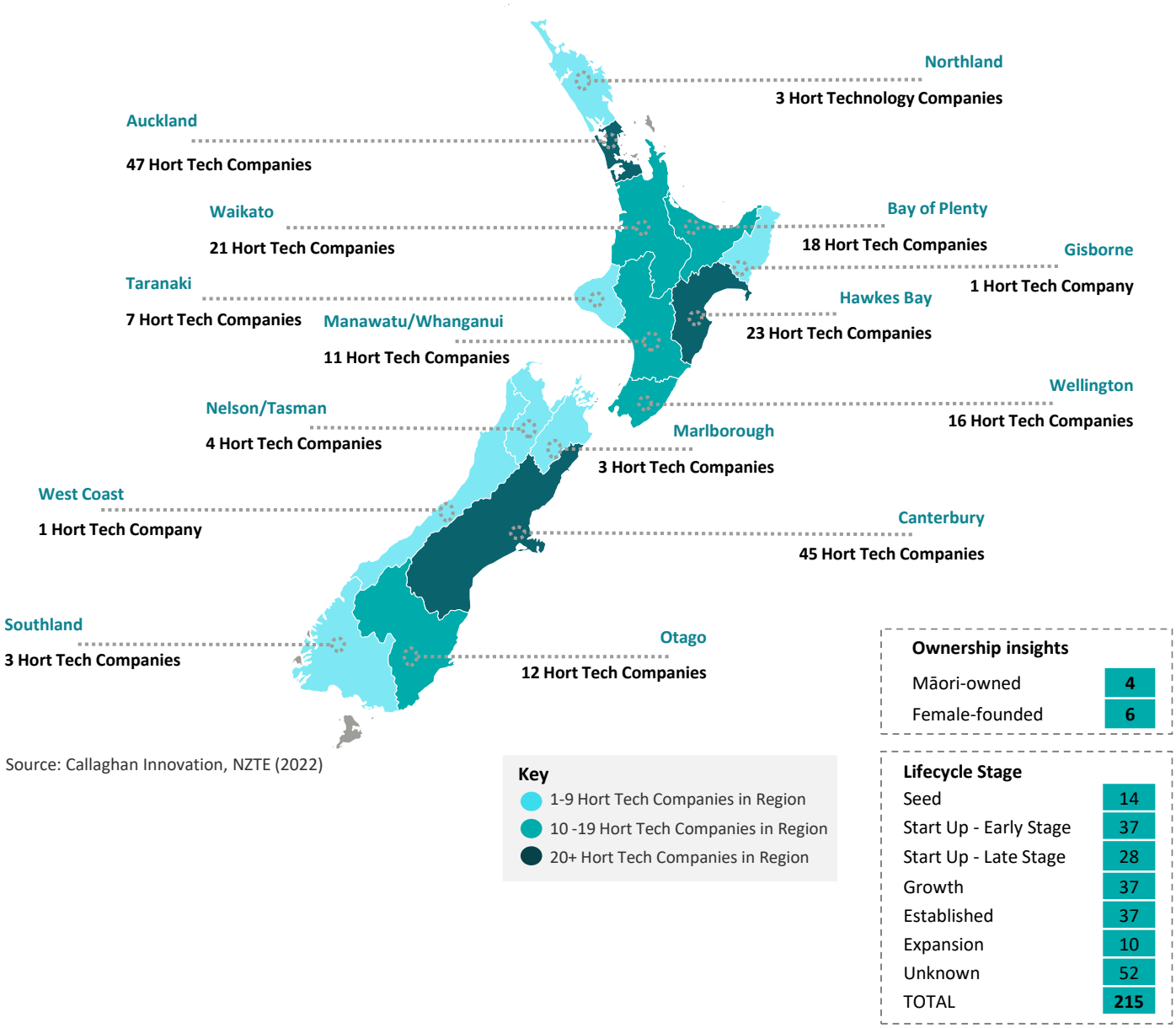
**Figure 13: Technology in the Horticulture Ecosystem**



## Using regional presence to connect the industry

Below is a snapshot of Callaghan Innovation and NZTE data that illustrates horticulture technology companies by region, life cycle stage, Māori-owned, and female-founded.

**Figure 14: Horticulture technology companies by region**




Source: Callaghan Innovation, NZTE (2022)

## Service Validation Journey: From market gap analysis, to service design and piloting of programmes

*How can we be sure that the Catalyst will deliver the support the market needs most?*

A range of activities have been undertaken over the past 18 months to scope, validate and refine the core services needed to meet the needs of the market. This includes:

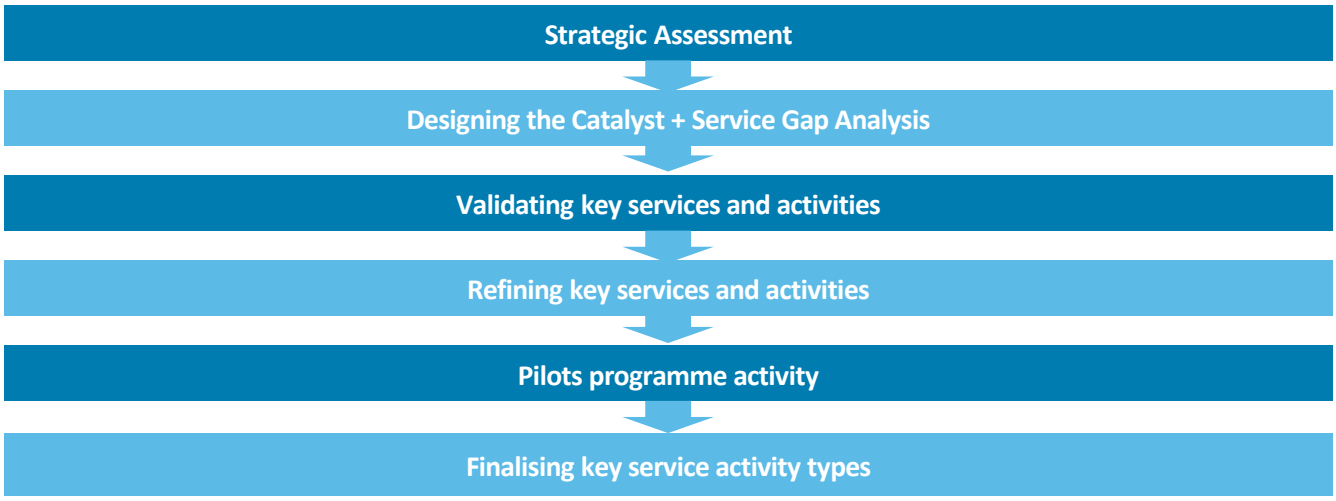
1. **The market gap analysis and service validation process:** designing and validating the services
2. **Market engagement:** engaging the market throughout the service validation process
3. **Pilot programmes:** running pilots to test proposed types of services and activities, and refining service offerings based on feedback provided

### The Market Gap Analysis and Service Validation Process

For the Catalyst to be a high-impact project, it must deliver in the space where it is most needed. This process helped to identify, refine and validate the Catalyst service offerings and activity types, from a broad list of possibilities, down to a refined set of priority high-value offerings.

Stepping through the process, the potential services of the Catalyst were refined. Throughout this process, key stakeholders were engaged to ensure the Catalyst continued to represent sector needs.

**Figure 15: Service Validation Process**




Key stakeholders within the market have been engaged throughout the service validation process, as outlined in the timeline in the following table.

**Table 9: Catalyst engagement timeline**

| Timeline | Engagement | |
|---|---|---|
| March 2020 – May 2020 | Strategic Assessment - stakeholder survey, interviews and workshops | Strategic assessment commences, with growers, technology companies, supporting agencies and research organisations.<br><br>A questionnaire was sent to 15 organisations participating in the Strategic Assessment on the purpose, services of focus of the Catalyst (previously Horticulture Robotics Academy).<br><br>A total of 35 individuals from 25 organisations engaged in strategic assessment through questionnaires, interviews, and workshops (see Appendix 1). |

| Timeline | Engagement | |
|---|---|---|
| **July 2020 – October 2020** | Indicative Business Case – early engagement | IBC development commences with Industry Reference Group, with five workshops to develop scope, services, and governance (see Appendix 1). |
| **January 2021** | Establishment Steering Group | Establishment Steering Group appointed to guide and advise on core establishment tasks (see Appendix 1). |
| **September 2021 – October 2021** | Indicative Business Case (IBC) and Economic Impact Assessment (EIA) | Refinement of the IBC developed in 2020 together with development of an Economic Impact Assessment. |
| **From November 2020** | Wider Ecosystem Engagement and Service Test Pilots | Service providers Callaghan Innovation and NZTE have been piloting activities in collaboration with wider Agritech ITP initiatives. These pilots have helped gain momentum for the Catalyst, providing a starting platform towards achieving its objectives, while also providing valuable industry feedback and learnings on what works well. Overall, these pilots provide confidence in the value and buy-in of the activity types the Catalyst will seek to run and offer.<br>Further detail on the pilots is provided below. |

## 2.4 Activity pilot programmes

Callaghan Innovation and NZTE have been piloting activities in collaboration with wider Agritech ITP initiatives. These pilots have helped gain momentum for the Catalyst, providing a starting platform towards achieving its objectives, while also providing valuable industry feedback and learnings on what works well. Overall, these pilots provide confidence in the value and relevance of the activity types the Catalyst will seek to run and offer.

*Community Building Events* were highlighted by the Industry Reference Group as sorts of activities that could be high-impact for the Catalyst, as they bridge the gap between the needs of the horticulture sector and technology companies' ability in providing innovative solutions. *Agritech in the Vineyards* was a community building event, run in collaboration with Bragato Research Institute and AgriTechNZ, which showcased technology 'makers' in viticulture in Marlborough. It brought together the wine industry, technology companies, and enablers including govt agencies to drive the success of homegrown agritech.

The following tables provide a summary of some of the pilot activities run to-date and the companies that participated. While these companies are mostly in horticulture technology, they vary across their company lifecycle and whether they are exporting their products.

There is a wide spectrum of specialist technology focuses within current market providers, with proven applications in pest management, crop estimation, GHG Emissions Management, water management and more.

Confidentiality

Confidentiality

Confidentiality

## Activity Types

Outlined in the table below are some of the activity types identified for delivery, but do not necessarily represent all activities that could be delivered by the Catalyst. These were developed in collaboration with the Industry Reference Group, and refined based on the pilot programmes tested to-date.

**Table 11: Service activity types**

| Activity Types | Industry Connector | Industry Talent Development | Project Facilitation |
|---|---|---|---|
| | International Immersions | Co-ordinate Workforce Placements | Horticulture Technology Workshops & Webinars |
| | Broad, Mixed Sector Industry Events | Business Basics & Hygiene | Technology Product Commercialisation Advice |
| | Technology Applications Showcase | Capability Programmes | Funding and Investment Access Support |
| | Communications & Community Building | Industry Secondments | |
| | Inward Missions | Facilitating Mentoring Support | |
| | Targeted Industry Events | | |
| | Industry Intelligence and Insight Reports | | |

## Priority activity types

While all these activity types are important to the industry, the Industry Reference Group has provided views on which should be prioritised in early delivery based on demand and potential impact (refer Appendix 5). These include enabling international immersions, providing industry intelligence and insights, facilitating workforce placements and secondments, and providing an inroad to specialist technology and product commercialisation advice. These reflect the sector's view of activities that can be provided in the near-term to address current needs and add significant value to the industry.

**Table 12: Key pilots delivered to-date**

| Service Types | Activity Type | Pilot | Target Audience | Number of attendees | Description | Impact / Feedback |
|---|---|---|---|---|---|---|
| Industry Connector | Inwards Missions | **US Agritech Discovery Tour /Discovery Day** | Gowers, technology providers, government and institutions from NZ and US. | 22 organisations | The Agritech Discovery Day was a great opportunity for California based growers and institutions to visit a premier New Zealand agricultural region, to interact with like-minded growers and technology providers and to gain a better understanding of opportunities between California and New Zealand. | • Started to create grower-to-grower network and provided a good channel for connections between technology companies and NZ growers.<br>• Showcased and demonstrated NZ Hothouse FTECH technology using automated spraying system.<br>• Created potential channel for technology companies through grower-to-grower network.<br>• Letter of cooperation initiated between the Californian State Govt and Ministry of Primary Industries. |
| | | **Walt Dufolk, Western Growers (Aug and Nov 2022)** | NZ Growers, Government Agencies and Technology Companies with a US focus. | 3 companies came to engage with New Zealand market | In August Walt Dufolk was guest speaker for the Apple and Pear Conference, and enroute to Australia they engaged with companies to discuss their market strategies in-depth.<br><br>In November, Western Growers held a virtual meet with NZ companies hosted by Callaghan Innovation as a follow up. | • Created links with Josh Ruiz across Callaghan Innovation. Potential to co-fund 50% of NZ companies rent that setup in Western Growers Centre for Innovation and Tech Centre for up to 6 months as part of Market Immersion Trips.<br>• Discussed potential opportunities, challenges, and insights in both regions.<br>• Opportunity for New Zealand start-ups and start-ups from other countries with US to include various locations to align with FIRA USA events in Salinas. |
| | | **Australia WineTech 27-29 June 2022** | NZ Wine Growers and technology companies | 50 companies | The Mini-Market Discovery Programme was a light-touch programme designed to support the New Zealand organisations that were attending WineTech in Adelaide.<br><br>Engaged deeply with the innovation, investor, and grower communities in that market to help the companies identify product-market fit. Allowed NZ companies and Australian counterparts to meet with hand-selected and relevant sector experts prior to attending the conference. | • Helped NZ agritech innovaters, researchers and technology companies make the right introductions in market.<br>• Created conversations and enabled access to experts who deeply understand the market.<br>• Identified unsolved issues that NZ's capability and knowledge may solve.<br>• Put NZ companies on the radar of Australian investors.<br>• Piloted initiatives that will be built upon for evokeAG 2023 Market Discovery.<br>• Provided opportunities to connect, in-person, with the evokeAG team.<br>• Attendees thought it was great event to meet key players of the NZ wine industry, and helpful to meet people pre-conference to develop relationships as an NZ cohort, and set a positive and collaborative intent. There was a diverse range of attendees across agritech, horticulture technology and viticulture. |

| Service Types | Activity Type | Pilot | Target Audience | Number of attendees | Description | Impact / Feedback |
|---|---|---|---|---|---|---|
| Industry Connector | Targeted Industry Events | **Agritech in the Orchards 24 August, 2022** | Agritech companies and research institutions | 115 delegates from 11 organisations | A day-long exploration session in Nelson, focused on accelerating the development and adoption of Agritech within the apple and pear industries of NZ. | • The event was valuable for networking opportunities. Great spread of industry enabling varied and diverse interactions.<br>• Great opportunity for technology providers to actively collaborate with users and makes affordability of new technology more accessible. |
| | Broad, Mixed Sector Industry Events | **Offshore Events** | | 30+ | Opportunity to grow NZ horticulture technology sector presence in global markets through event leveraging and attendance for companies who want to understand market opportunities or grow current market share. Includes events such as evokeAG, FIRA and Forbes AgTech. | • 'Hort Connections', UK-Ireland Market Immersion, Brazil Accelerator Programme and 'Cherry Connection' in Chile all generate connections, identify partnerships, validate product and market propositions and provide real and current insights in potential markets.<br>• Increased company capabilities and helped to develop commercial opportunities. |
| | | **NZ Industry Events Fieldays 30 Nov- 3 Dec, 2022** | | All access | **Connecting NZ's Airborne Agritech Seminar /Tour**<br>The seminar brought together key players for new connections, collaboration, and discussion. The tour introduced attendees to industry groups articulating problems that remote sensing technologies may be positioned to solve. | • There is an accelerated emergence of remote sensing technologies, including drones and other technology used in horticulture; and although horticulture technology is not a primary focus of the agriculture focussed event, horticulture representation of companies and industry is present and include Zespri and NZ Avocadoes. |
| | Industry intelligence and insight reports | **Global Signals** | Agritech companies | 795 Subscribers | Global Signals is a monthly newsletter and workshop series designed to teach agritech companies how to identify global signals that can impact their business. | • Capability building and future looking. Helps companies think about opportunities before they become obvious. Develops a future thinking, long-term mindset. |
| | Technology Applications Showcases | **Early Adopter Network** | Agritech sector | 6 Hort Tech Companies | The Early Adopter Network aims to bring together experts from across the agritech sector, to work on common global problems, and open new opportunities to learn, collaborate, explore, and solve those problems. | • Working with NZTE the network has created opportunities for NZ agritech companies with leading grower groups in Australia, Latin America and North America. This has enabled early-stage and scaling businesses to access a network of engaged growers for testing technology.<br>• Hectre secured a trial with Copefrut in Chile as a result of this and other support. |
| | | **Agritech in the Vineyards** | Wine industry, tech companies, and enablers. | 5 technology companies | Showcase of technology 'makers' in viticulture in Marlborough, in collaboration with Bragato Research Institute and AgriTechNZ. | • Pernod Ricard Winemakers working with Smart Machine has resulted in the development of autonomous vineyard tractor called OXIN. |

| Service Types | Activity Type | Pilot | Target Audience | Number of attendees | Description | Impact / Feedback |
|---|---|---|---|---|---|---|
| Industry Connector | Communicat-ion and community building | **Agritech Knowledge Hub** | Technology companies | All access | The Agritech Knowledge Hub is a digital platform, aggregating technology businesses developing agritech and horticulture technology solutions as a single point to find collaborators and competitors. | • As a prototype, this tool has been developed in response to industry demand to understand technology solutions available. Recently launched but well utilised to date according to digital data. |
| Industry Talent Development | Capability Programmes | **Scale for Global Growth** | Horticulture technology companies | 8 companies | Scale for Global Growth is a programme run by Callaghan Innovation and NZTE, designed to help NZ agritech businesses pursue commercial success in international markets. | • Identified market entry opportunities, governance requirements, regulatory and compliance requirements, investment needs, identification of use cases, sales strategies, partnership opportunities, brand strategies, business model refresh, financial modelling. |
| Project Facilitation | Horticulture Specific Workshops & Webinars | **CCA & Remote Sensing Regulation Workshops** | Remote sensing community | TBD | An online webinar, working with remote sensing research community to help them better understand regulations and commercial opportunities in agriculture. | • Early days – Bringing research community closer to the technology community. |
| | | **Industrial Hemp & Medicinal Cannabis** | Industrial hemp and medicinal cannabis market | TBD | Working with the new and emerging Industrial Hemp and Medicinal Cannabis market to assist with innovation opportunities, such as whole plant utilization to reduce waste and increase return. | • Supporting industry with knowledge and capability (not commercial activity), but with a 5-year time horizon. |
| | Technology and Product Commerciali-sation Advice | **Global Insights** | | TBD | Provides Callaghan customers access to global experts per one hour phone call, to help them make pivotal or strategic decisions. | • Confidentiality<br>• It was an opportunity to access those insights directly, which they otherwise would not have been able to access a conversation with that level of experience very easily, and has accelerated their work to enter that market. |
| | Funding and Investment Access Support | **Agritech Support Explorer** | | All access | A digital information tool for companies to navigate the rapidly evolving funding and support landscape in agritech and horticulture technology. | • This is a tool that the industry had identified as useful, and Callaghan Innovation are still piloting to understand the uptake. |

Below is information on related ITP activity also underway in the wider agriculture and agritech sectors. These activities could be leveraged for use by horticulture technology specific companies, if appropriate.

**Table 13: Related ITP Activity**

| Service Type | Pilot | Target Audience | Number of Attendees | Description | Impact / Feedback |
|---|---|---|---|---|---|
| **Related ITP Activity** | **Product Market Fit (FY22/23)** | Supporting the transition point between early entry and growth rapidly increasing indicating future organic growth potential. In growth phase or established model. Not start up, horticulture technology companies. | Will be piloted with select companies by June 2023. | An NZTE prototype framework to help Agritech customers better understand their product market fit to make better decisions early; to reduce risk, time and cost; and work to bring together existing services and support from both NZTE and other ITP partners | • A prototype available to pilot with a small number of agritech customers.<br>• Agritech customers get into new markets more successfully via better decision making, and the NZTE customer team can better support agritech customers at varying stages of their growth journey. |
| | **Agritech Accelerator Programmes (FY22/23)** | To help companies build robust value propositions to be matched to high value international partnerships, seek mentorship and identify their 'ownable markets'. | Select companies TBD | Select suitable customers to engage delivery partners and relevant in market teams.<br>Run 2x accelerator programmes (6 months) and where possible, relevant immersion opportunities. | • Companies need more capability building and understanding of their product market fit to meet international partner expectations and align with their needs. Better identification is required from agencies early on.<br>• Companies are typically time poor and these programmes need to offer a strong value proposition and outcome for them. |
| | **Global Insights Report (FY22/23)** | Agritech Companies | Underway | Scope and develop a research report into Global Opportunities / Target Markets to steer the sector with insights for the next 3-7 years by delivering a report detailing target opportunities and markets for agritech and recommendations for implementation. | • Work to be completed. |

## Case study – Agritech in the Orchards

Agritech in the Orchards is an example of a pilot event and represents a key type of activity for which the Industry Reference Group wanted to see more of: targeted industry events. Agritech in the Orchards built off a previous pilot event held, Agritech in the Vineyards, learning from its model and adapting to what provided the best outcomes for the attendees.

Agritech in the Orchards was held in Nelson, bringing together 115 companies and potential customers, with a focus on accelerating the development and adoption of agritech within the apple and pear industries. There was resounding positive feedback from those who attended this event.

The morning session featured expert presentations on agritech technology and its use in the orchards. This included two panels: *Automation in the Orchard* and *Digital Future of Sustainability*.

At Vailima Orchards in Nelson, seven industry companies and groups demonstrated their achievements by showcasing their agritech to the industry, including potential customers. This ranged from large-scale machinery, like autonomous tractors by Agri Automation, to intangible technology, such as Landkind's software for orchard management. The Industry Reference Group highlighted a key barrier to adopting new agritech is often the lack of awareness of its existence, and so providing an opportunity for technology providers to actively collaborate with potential users is an important step in bridging the information gap on the scope and affordability of these products.

The feedback from the event re-affirmed the importance of in-person demonstrations of agritech products, and highlighted the value of building connections and networking within in the industry. All respondents of the post-event survey indicated they made new connections, with plans to follow up on these. With both the success of Agritech in the Orchards and Agritech in the Vineyards, these events show promise across multiple subsectors of horticulture technology and agritech.

**A demonstration of new technology at Vailima Orchards, Nelson**


*"[The event was an] excellent opportunity to be surrounded by your peers, expand your network and understanding of how you can help agritech unlock some of the opportunities facing our agri sector."*

*"A great event for all participants in the horticulture industry, lots of excellent networking and knowledge sharing. Very well managed."*

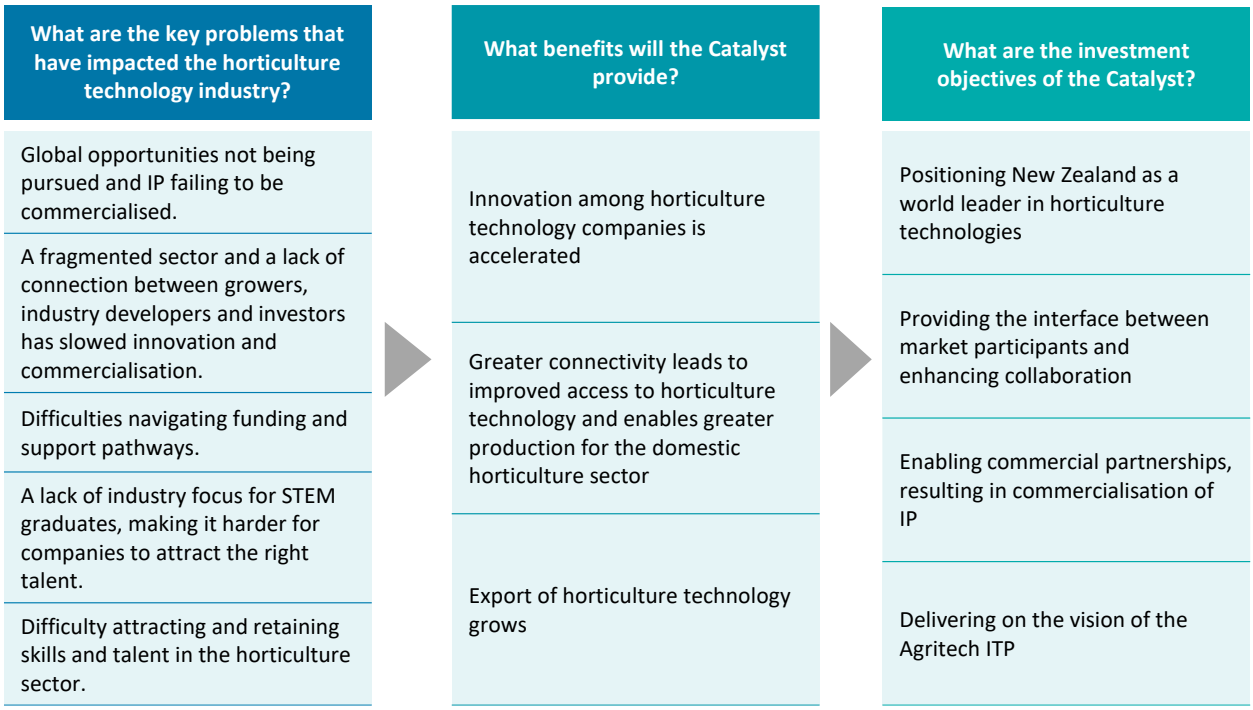
*"This event had a great spread of the industry present, enabling really fruitful and varied interactions, networking at these types of events is just so much easier than in normal settings."*

***Reviews from delegates who attended the event, 24 August 2022***

## 2.5 Problems, benefits and objectives

The Catalyst will address a number of problems affecting the horticulture technology industry. These were identified through the engagement process with the horticulture technology ecosystem.

**Figure 16: Catalyst benefits and objectives**




## 2.6 Problem statements

Key issues in the local horticulture technology sector are driving the case for change, which has helped shape what the Catalyst should be and how it can support the industry. New Zealand has a number of challenges and barriers to developing technology solutions at scale and realising commercialisation opportunities.

### What are the key problems that have impacted the horticulture technology industry?

- Opportunities not being pursued and IP failing to be commercialised, due to lack of access to global markets, limited public and private funding, and scaling challenges.
- A fragmented sector and lack of connection between growers, technology developers and investors has reduced access to on-the-ground, lived experiences, slowed the speed of innovation and resulted in a disconnected flow of commercialisation activity.
- Difficulties navigating pathways to existing public funding, grant schemes, and other business support, provided through a range of government agencies.
- A lack of industry focus for STEM graduates, resulting in a disconnect between technical expertise and practical, commercial outcomes and ultimately difficulties for technology companies to attract the right talent.
- Difficulty attracting and retaining skills and talent in the horticulture technology sector.

**Is there a need for the Horticulture Technology Catalyst?**

*"Strong IP and talent in horticulture robotics would have flow on effects to supporting industries and adjacent technology sectors. This would not only spur high-quality job growth, but build a complete industry around robotics and automation. The flow on effects would include further talent acquisition and investment."*

***– Industry Stakeholders from Strategic Assessment (see Appendix 1)***

## 2.7 Investment objectives

*The Horticulture Technology Catalyst will assist in positioning New Zealand as a beacon for horticulture technology globally.*

The Catalyst's intended purpose is:

- To build a collaborative approach to solving big problems in the sector, and to make it easier for industry participants to navigate the web of funding and assistance available.
- To help industry participants have a clearer view of global commercialisation opportunities and where local firms might capitalise.
- To facilitate training for the next generation of thinkers and innovators who want to get 'dirt on their hands' understanding the sector and working closely with those growing and packing produce. This will help generate high-paying, high-skilled jobs in a sector traditionally reliant on low-wage labour.
- To facilitate partnerships – through introductions, advice and project support – to break down barriers to commercialising IP and enhancing the maturity of the industry.
- To shine a deliberate light on New Zealand's horticulture technology industry and, through this, attracting international investment and talent to the country.

**What is the purpose of the Horticulture Technology Catalyst?**

*"The Horticulture Technology Catalyst will assist in positioning New Zealand as a beacon for horticulture technology globally. It will have an end-to-end purpose, providing the interface between research and training, investment and commercialisation, and end-user uptake."*

***Purpose Statement – Industry Stakeholders, Strategic Assessment (see Appendix 1)***

The purpose statement has helped shaped what this initiative is seeking to achieve, its investment objectives.

### Investment Objectives

The industry needs investment and government backing to tap into and activate the true potential of the industry. The Horticulture Technology Catalyst's objectives reflect what this initiative is seeking to achieve and what success looks like if it was accomplished.

The four investment objectives were developed through discussions with key stakeholders, including the Industry Reference group.

**Figure 17: Investment objectives**

| | |
|---|---|
| 1 | Positioning New Zealand as a world leader in horticulture technologies |
| 2 | Enabling commercial partnerships, resulting in the commercialisation of IP |
| 3 | Providing the interface between market participants and enhancing collaboration |
| 4 | Delivering on the vision of the Agritech ITP |

These investment objectives are detailed further in the Economic Case. They have been used to help evaluate the options and validate the short-list of options taken forward.

## 2.8 Benefits

The Horticulture Technology Catalyst will provide benefits across the technology and horticulture sectors.

**Figure 18: Catalyst benefits**

| | |
|---|---|
| 1 | Innovation among horticulture technology companies is accelerated |
| | KPI 1: Number of companies using the Catalyst<br>KPI 2: Number of companies commercialising innovation |
| 2 | Greater connectivity leads to improved access to horticulture technology and enables greater production for the domestic horticulture sector |
| | KPI 1: Number of horticulture growers using technology solutions<br>KPI 2: Domestic horticulture production |
| 3 | Export of horticulture technology grows |
| | KPI 1: Number of horticulture technology companies exporting<br>KPI 2: GDP contribution of horticulture technology |

*These benefits align and contribute to the Living Standards Framework.*

Higher living standards for all New Zealanders is the goal of many government investments, and the basis for effective central funding and policy decisions. Investment in the Catalyst will contribute to New Zealand's wellbeing domains – specifically, those of knowledge and skills, jobs and earnings, and income and consumption.

Additionally, the broader agritech sector makes a strong contribution to the infrastructure underpinning an open, free trade-based economy, by enabling greater production in, and value from, the food and fibre sector.

**Table 14: Catalyst benefits and living standards framework**

| Domain | Benefit |
|---|---|
| **Knowledge and skills** | Upskilling and education: Focusing on one discrete aspect of agritech – horticulture technology – will help not only upskill graduates and employees in those companies, it may also increase the cohort of young people and rangatahi interested in pursuing a career in the sector. |
| **Jobs and earnings** | High-skill opportunities: Accelerating the horticulture technology sector's growth will require an increase in employees in the sector. These will be highly-paid and productive jobs, creating opportunities for increased wellbeing. |
| **Income and consumption** | Production and exports: Increasing successful commercialisation of horticulture technology will increase exports and therefore the revenues and resulting earnings and consumption of firms and employees. The Catalyst will also improve the horticulture sector's production and efficiency, increasing yields and export volumes and therefore the consumption capacity of its employees. |

## 2.9 Current arrangements and business needs

### Investment Objective One: Positioning New Zealand as a world leader in horticulture technology

#### Helping local companies succeed globally

**Current Arrangements**

Many horticulture technology companies are 'born local', responding to a particular need they observe in their regional industry. From there, some are able to 'go global' by understanding the regulatory and environmental conditions of particular overseas markets, the applicability of their own technology to those markets, and the demand – which takes time, effort, connections and resources. This is in contrast to other types of technology companies outside horticulture technology, which may think from a global standpoint immediately.

**Business Needs**

Local horticulture technology companies need assistance in two areas – making the transition from local to global, and more broadly being able to think globally from the outset. While the latter may be easier for start-ups, both new and established companies often need help understanding global markets, accessing the right people, and getting in front of investors, users, and influencers. Demonstrating an understanding of what markets require – and having the confidence and commitment to face off to those markets – is an area where companies need assistance, and is where the Catalyst can help through its focused insights and connection services.

### Generating high-quality job growth in a range of engineering, technical, scientific and commercial areas across the horticulture sector

#### Current Arrangements

Growing uptake of technology on-farm, as well as the increasingly important role of genetics, means the horticulture technology industry needs strong technical expertise more than ever. However, the regional concentration of horticulture activities, and increased urbanisation, means the industry has struggled to attract talent.

#### Business Needs

The Catalyst through increased business activities will inject the horticulture technology sector with high-quality, high skilled jobs, which will attract people into the industry throughout New Zealand. Through mentoring, coaching and advisory for innovators and entrepreneurs, the Catalyst will also help in developing industry talent.

These jobs will bring more people into rural areas where the horticulture technology is adopted. An average salary of an those working in the agritech industry is substantially higher than those of traditional farm workers.

## Investment Objective Two: Enabling commercial partnerships, resulting in the commercialisation of IP

### Fostering commercial relationships; enabling the creation of world class transferrable IP

#### Current Arrangements

While partnerships or collaborative ventures are formed in New Zealand to commercialise agritech, there is no single dedicated mechanism to bring together people with common interests, to truly collaborate on a venture; not only for a commercial return, but also for the betterment of the industry.

#### Business Needs

Business planning needs to drive IP strategies, rather than IP being a roadblock to commercial partnerships – often a hurdle collaborator finds difficult to overcome. Technology companies and growers need specialist assistance and advice in relation to the commercial and operational complexities of managing new ventures and partnerships. For example, commercial and legal advice would help organisations to navigate and manage complex IP rights when co-developed by multiple parties, ultimately helping to drive technology commercialisation in New Zealand.

### Access to market analysis and insights so the industry can understand what is already being done and what is needed (e.g. research or commercialisation)

#### Current Arrangements

Often local technology companies do not understand what overseas investors are looking to support or bankroll, or what they may currently lack. It requires a change in mindset – from creating solutions to local problems and exporting them when there happens to be a niche, to thinking globally from the start.

#### Business Needs

A database of local and international trends and information to inform the domestic industry. This will help broaden the industry's knowledge of what's happening globally. In a world with limited travel opportunities, the ability for New Zealand to stay connected virtually has taken on renewed importance.

Government already plays a key role in building and expanding international connections, such as through agencies like MFAT, NZTE, and MPI maintaining a presence in key markets. Linking and collaborating with these agencies allows firms to leverage off these official connections and therefore amplify New Zealand's presence overseas and continue to strengthen existing relationships with investors and initiatives.

### Helping companies navigate commercial complexities which slow innovation

#### Current Arrangements

While New Zealand might be the easiest country in the world to register and start a business, sustaining a business and making it profitable, particularly as a founder, is no easy feat. Unique challenges around intellectual property management, commercial partnerships, raising capital, and market entry are all hurdles that technology companies face early on – challenges that may slow or sabotage the innovative process completely.

#### Business Needs

Companies need to connect with a range of vendors, both public and private, that can help solve these problems. An organisation providing commercial support and which may lead, facilitate or participate in projects, will lift the burden of project management for smaller organisations. Participating companies need help making the right decisions early on, to avoid roadblocks and expenses such as legal pursuits relating to intellectual property.

## Investment Objective Three: Providing the interface between market participants and enhancing collaboration

### Facilitating access to global markets and investors, and furthering export opportunities

#### Current Arrangements

Some organisations struggle to navigate, access and draw interest from investors, particularly in the venture capital space. It is important to drum up interest in commercial opportunities to help generate innovative automation solutions. The industry needs hands-on business support to develop the value proposition for each project, and developing solutions that can be adopted in international markets to ensure sufficient demand for end products.

#### Business Needs

The industry needs to build connections with domestic and global capital markets, which will support businesses looking for growth capital for commercial and exporting opportunities.

While the Catalyst cannot create investor demand, it can help technology developers connect into local and global capital markets. It will leverage available relationships and provide the platform to showcase new technology or promote early-stage investment opportunities that are looking for financial backing or proof that there is sufficient demand for technology solutions before progressing commercialisation.

### Fostering technology solutions, to overcome challenges, encourage and enable innovation, and create a more resilient industry

#### Current Arrangements

There are currently a range of players, institutions and organisations in the horticulture technology ecosystem. While pockets of collaboration exist, there are also diffuse agendas and objectives, which hamper the ability to ‘pull in the same direction’.

#### Business Needs

To provide a cohesive offering that supports New Zealand organisations, that also links with, and provides inroads to, global markets, and to amplify New Zealand’s small but growing reputation as a producer of quality agritech, collaboration and unity among the industry is vital. There will always be commercial imperatives and competing agendas at play – but the Catalyst can bring together participants collaboratively and with transparency, which will help the industry grow and mature.

The collaborative operating model of the ITP underpins the Catalyst. This seeks to bring together key government and industry stakeholders to understand the industry’s current state, its aspirations, and map out

actions to move towards this long-term future. This deliberate approach will increase the resilience of the industry and give investors' confidence to invest in and work with the New Zealand agritech industry.

By lifting the industry's eyes over the horizon to the problems and opportunities that exist overseas, participants will be able to be better connected to grower challenges and investment and research, which could assist with paths to market for locally developed innovations

### Attraction of global partners/companies who may establish an operational presence in New Zealand

#### Current Arrangements

With a relatively small domestic market, New Zealand technology companies will need to think globally to build a viable horticulture technology export industry. While domestic growers can provide a good test-ground and some revenue, international growers have significantly more scale and therefore agglomerated demand for horticulture technology solutions, tapping into which will enable our horticulture technology industry to grow more successfully. Equally, international investors will provide a higher scale of investment – some in New Zealand's agritech industry have noted that investments here can be difficult to find, while also being for less money and greater shares of ownership than overseas. As well as needing a global perspective and globally-relevant innovation (as discussed above), the industry needs the presence and interest of international capital through long-term relationships. Developing this interest will require a concerted and long-term effort.

#### Business Needs

Validating the overseas 'investment case' for horticulture technology companies, attracting capital and captivating further innovation interests is vital. New Zealand's profile needs to be raised internationally by demonstrating the quality of technology being developed, the seamless nature of commercialisation pathways, and a deep talent pool. These factors, along with a strong counter seasonal testing environment, will hone the international perception of New Zealand as ideal for technology development, capital raising, testing and market deployment.

## Investment Objective Four: Delivering on the vision of the Agritech ITP

### A step towards transforming the industry

#### Current Arrangements

The integrated nature of developing the Horticulture Technology Catalyst, as a partnership between the government and researchers, technology companies, growers, industry bodies and government enablers, is a significant step in bringing together an industry which, to many, has been fragmented and diffuse – both from the industry side and the government side.

#### Business Needs

One of the key aspects of the Catalyst is bringing together a range of services under a single offering for various participants. This is a clear entry point for anyone in the industry – local or overseas – to filter through in order to meet other parties, understand and contribute to research, and to see the 'critical mass' of New Zealand's horticulture technology industry. It's the key first step in presenting a cohesive and united story about the importance of the industry to New Zealand's economy.

### Utilising cultural knowledge and growing existing Māori assets to the benefit of New Zealand

#### Current Arrangements

Cultural knowledge of land and natural resource management is widely acknowledged as a valuable contributor to lifting performance and productivity within New Zealand's agriculture sector. Research with Manaaki Whenua – Landcare Research to better understand Māori cultural perspectives, identified provisional indicators around soil health.[34] This is an example of how cultural knowledge can be integrated with, and be complementary to, New Zealand's horticulture technology efforts. Currently, Māori and iwi have considerable interests in horticultural land, and comprise around 17 per cent of the sector's workforce. The Māori population is young, and there is an opportunity to open pathways for them in horticulture technology, which would benefit their horticultural land, provide the opportunity to grow in to high-skilled, well-paying jobs, and contribute cultural knowledge to technology and innovation.

#### Business Needs

Māori organisations are often innovative, aim to incorporate Māori values and have the potential to support outcomes in a culturally grounded way. However, there are few Māori/iwi founded or owned horticulture technology companies, despite the significant Māori interests in productive land. The Catalyst could provide an opportunity to tailor services specifically to encourage uptake and interest in horticulture technology, with a focus on talent development for rangatahi Māori.

### Provide clear pathways to government funding, and support companies accessing capital markets

#### Current Arrangements

There is a need to provide clear pathways to existing government funding. However, the process to access Government funding sources, meet required criteria, and understand what the capital can and cannot be used for, is difficult to navigate and is currently stifling potential industry growth.

There is a variety of Government R&D funding available to the wider food and fibre sector, though the industry lacks targeted investment for engineering and innovation which could help support technology initiatives, resulting in a lesser amount of IP ready for commercialisation.

#### Business Needs

Companies need help demystifying government funding mechanisms, and gaining transparency over what is available and how to access it.

[34] Analytical Paper 22/02: Background Paper to Te Tai Waiora: Wellbeing in Aotearoa New Zealand 2022: Trends in Maori Wellbeing - 12 December 2022 (treasury.govt.nz)

## 2.10 Key Service Requirements

Key service requirements help illustrate the scope of different choices available for key variables under consideration. These are used as a starting point for creating a scope that is used in the development of the long-list options.

The table below identifies the key service requirements of the Catalyst.

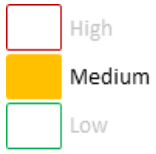
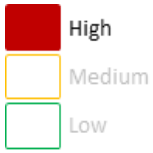
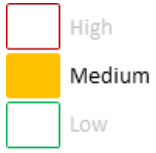
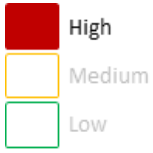
**Table 15: Key service requirements**

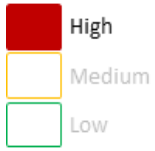
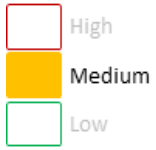
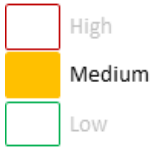
| Service Requirement | Scope Assessment | | | |
|---|---|---|---|---|
| | **Minimum** | **Intermediate** | **Maximum** | **Out of Scope** |
| **Catalyst entity:** Structure and Catalyst staff | Use existing MBIE resources; no new staff | New team and staff within MBIE | New stand-alone public entity, including new staff | Private company |
| **Establishment services:** resources required to undertake pre-implementation and establishment activities | Use existing MBIE resources | Contracting establishment team | Outsourcing branding, marketing, and service design activities | N/A |
| **Advisory services:** resources required to design and deliver core services to the market | Contracting of existing services offered by partnering organisations | Contract the design and delivery of new services to meet market gaps | Hire new FTEs within the Catalyst to deliver services | Full in-house delivery of services; no contracted services |
| **Digital presence:** technology which allow the Catalyst to fulfil objectives and deliver services | Website as the entry point of the Catalyst, to access core information | Plus, promotional video content | Accessible data platform to store a variety of industry information and research insights | N/A |

## 2.11 Key risks

Material risks for investment in horticulture technology and establishing the Horticulture Technology Catalyst are outlined below. The likelihood and impact of each risk has been assessed as low, medium or high, and a high-level strategy for mitigating the risk has been considered.

**Figure 19: Key risks**

| Growth option risk | Risk likelihood | Risk impact (if unmitigated) | Mitigation strategy |
|---|---|---|---|
| **Lack of sustainable customer demand:** There is the risk of a lack of enthusiasm from the New Zealand market and limited utilisation of the Catalyst's free services.<br><br>The current proposal is that some services will have a charging mechanism attached, depending on interest during the in-depth market testing phase of the Detailed Business Case development. The market may be interested in these services, however, there may be resistance from customers to agree to the charging mechanism. |  |  | • Extensive stakeholder engagement. A gap analysis of the proposed list of services was undertaken to support stakeholders in the decision of which services to take forward.<br>• Conduct market testing during the development of the Detailed Business Case.<br>• Continue to test developing services with industry groups, including service validation piloting in establishment. |
| **Lack of enduring government support:** The Horticulture Technology Catalyst will be publicly funded and require ongoing financial support from the government. There is the risk it will not receive adequate funding to enable a sustainable model. This risk could be compounded with potential government spending decisions, as a long-run impact from Covid-19. |  |  | • Seeking ongoing funding through Budget 2023<br>• The Catalyst itself will not draw private investment, however the projects or commercial venture will likely draw interest from the private market in time. There may be opportunities to draw returns from investment in commercialisation ventures if the government invests capital through existing public funds or a new fund if one were established as a separate initiative under the ITP. However, this would flow to the investing agency, which is not necessarily the Catalyst itself. |

| Growth option risk | Risk likelihood | Risk impact (if unmitigated) | Mitigation strategy |
|---|---|---|---|
| **Multi-agency delivery risk:** The proposed delivery partners, Callaghan Innovation and NZTE, would deliver this initiative in partnership with MBIE, with all agencies having responsibilities in ensuring its success.<br><br>If the agencies withdraw support or lower the priority of this initiative, it will be more difficult for the Catalyst to develop international relationships and support investment initiatives by connecting New Zealand market participants to potential buyers or investors overseas.<br><br>With multiple agencies, all of which have different operating models, working collaboratively, there is a risk accessing various Catalyst-funded activities will not be a seamless customer experience. |  |  | • Maintain a strong relationship with agencies including MBIE, Callaghan Innovation, MPI and NZTE, building on the success and lessons learned since the ITP was established.<br>• Develop an agreement outlining expectations, responsibilities and roles, access to global networks and how the agencies will work together.<br>• Project has joint ministerial leadership from the(Minister for Economic Development) and the Minister of Agriculture.<br>• A shared resourcing plan in place, and a collaborative pilot between Callaghan Innovation and NZTE is being undertaken as part of establishment.<br>• Management oversight from MBIE Senior Management will mitigate the risk that agencies maintain a strong relationship and meet the terms of their agreement. |
| **Not achieving desired impact or scale of change within the industry:** The Horticulture Technology Catalyst requires experienced governance, skilled management, effective marketing, buy-in from stakeholders and uptake from the market. There is the risk that lack of buy-in from stakeholders or demand from the industry will fail to transform the industry and will not deliver on key benefits. |  |  | • A targeted approach is being adopted, based on sector needs and growth potential. The initiative will initially focus on horticulture, and opportunities in technology. This will ensure the Catalyst has a clear focus and target audience, and enable a more efficient setup of the facility and its services.<br>• There is the intention to broaden the scope of the target market to achieve scale and support the wider agritech sector. |

## 2.12 Dependencies and Constraints

The proposal is subject to the following constraints, dependencies and assumptions. These dependencies will be carefully monitored during the project.

**Table 16: Dependencies and constraints**

| Dependency | Notes |
|---|---|
| **Ecosystem Collaboration** | The Horticulture Technology Catalyst relies on ecosystem participants (researchers, innovators, growers, enablers and connectors) to remain willing and open to collaboration to be generate the most benefit from its envisaged connector role. |
| **Constraint** | **Notes** |
| **Funding** | The ability of the Horticulture Technology Catalyst to provide services will be limited by the ongoing operational budget it is able to secure. |

## 2.13 Summarising the need and benefits of the Horticulture Technology Catalyst

**Figure 20: Intervention logic for establishment of the Catalyst**

| Problem / Opportunity | Inputs | Activities | Outputs | Outcomes |
|---|---|---|---|---|
| **The Opportunity**<br>NZ as a global leader in horticulture technology<br><br>**The Problem**<br>- Global opportunities not being pursued and IP failing to be commercialised.<br>- A fragmented sector and a lack of connection between growers, industry developers and investors has slowed innovation and commercialisation.<br>- Difficulties navigating funding and support pathways.<br>- A lack of industry focus for STEM graduates, making it harder for companies to attract the right talent.<br>- Difficulty attracting and retaining skills and talent in the horticulture sector. | **Funds**<br>Establishment funding is required over four years to establish and support early operations of the Catalyst.<br>Thereafter ongoing operational funding will be required.<br><br>**People**<br>We expect that by year four, the Catalyst will employ a number of FTEs to deliver projects across the country. | **Connectivity and Collaboration across the ecosystem**<br>Enabling relationships between industry investors, researchers, innovators and government.<br><br>**Knowledge base and thought leader**<br>Building a knowledge base of national and global ideas, technology, problems and potential markets and stimulating future based thinking and engagement on potential opportunities for NZ.<br><br>**Pathways to commercialisation**<br>Enabling and supporting the commercialisation of horticulture technology research and innovation through the delivery of trusted and integrated services to facilitate and support horticulture technology projects.<br><br>**Industry Talent Pipeline**<br>Facilitating the development of an industry ready talent pipeline to support the growing industry and value based employment opportunities.<br><br>**Global opportunities**<br>Facilitating global connections and export opportunities for NZ horticulture technology. | **Ecosystem Connection**<br>Development of a nationally connected and cohesive ecosystem, focused on globally relevant opportunities.<br><br>**Technology Commercialisation**<br>Facilitating and supporting technology commercialisation and growing the number and size of companies in the industry.<br><br>**Talent Development**<br>Developing a pipeline of industry ready talent to support the growing industry and creating high value jobs.<br><br>**Internationalism**<br>Assisting with internationalisation and shifting along the volume/value chain. | **Short-term (12 months)**<br>- Improved awareness, alignment and collaboration within the industry<br>- Increased understanding of available funding streams<br>- Detailed market scan to support detailed service design<br>- Clear definition of the skills and talent gap within the industry<br><br>**Medium Term (1-3 years)**<br>- Connectivity and collaboration increasing across regions and ecosystem participants<br>- Reduction in the fragmentation of the support mechanisms for horticulture technology<br>- Uptake of available funding streams increasing, inter-agency connectivity increasing and discussions underway on gaps in funding support<br>- Commercialisation metrics and risk profile starting to improve<br>- Increased engagement between tertiary providers and industry to solve the 'industry ready' gap. Initiatives underway to provide real world experience.<br>- Greater global connectivity<br>- Improved alignment between industry and research providers on potential projects to solve real world problems<br><br>**Long term (3+ years)**<br>- Measurable improvement in connectivity and cohesiveness across the ecosystem<br>- Increase in investment in horticulture technology resulting in the acceleration of commercialisation of new technologies<br>- The Catalyst is a trusted facilitator of successful projects<br>- A growing pipeline of industry ready talent<br>- NZ's reliance on a migrant labour force reducing and a lift in the number of high value jobs in the industry<br>- Enhanced global reputation and technology export opportunities are being realised |

# 3 Economic Case

## 3.1 Introduction

The Economic Case explores the potential of the Horticulture Technology Catalyst, what it offers and how it would benefit key stakeholder groups. It sets out the process undertaken to arrive at the Preferred Option – establishing the Catalyst with a targeted set of services.

Cabinet endorsed the indicative business case and the Preferred Option in April 2022. Since the approval of the business case, there have been significant shifts in both the economic and fiscal environment, nationally and internationally. This is increasingly placing pressures on public sector spending decisions, particularly in an environment of increasing interest rates and inflation. In between the indicative business case approval and commence of detailed business case development, the Preferred Option was modified in recognition of these fiscal pressures. While the core service and focus remain unchanged, the Catalyst has moved to a more agile, virtual delivery approach, accommodating staff in existing facilities, rather than leasing new premises. This also makes Option C (Catalyst Plus) unattractive given the wider scope of services which is far more expensive to establish and deliver.

### Long-list Options

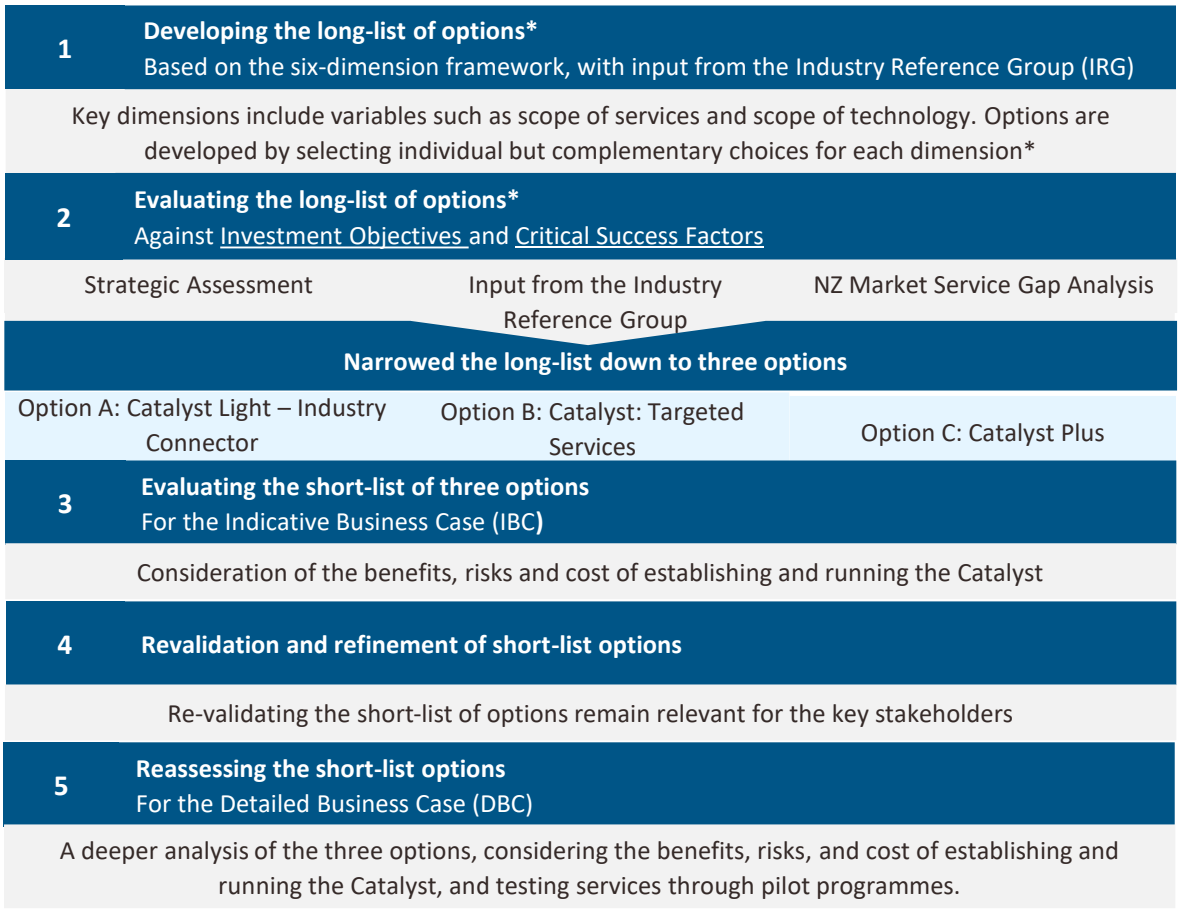
A long-list of options was developed in the indicative business case using a six-dimension framework, with consideration of the Government's role in enabling the future state of New Zealand's horticulture technology industry. Options were assessed against investment objectives and critical success factors to reach a short-list of options. The long-list options and the short-listing process are outlined in Appendix 2.

### Approach to validating the preferred option

The short-list options include the Status Quo, which assumes the Catalyst is not established and its services are not provided by government or industry, and that the pilot programmes undertaken to-date cease. The Economic Case outlines the short-list options under consideration, how the options were evaluated and the results, and identifies the preferred investment option to optimise value for money.

The Preferred Option is outlined in further detail, outlining how it best achieves the investment objectives. The approach to determining Preferred Option is set out in Figure 21.

**Figure 21: Approach summary***




*See Appendix 2 for further information on developing and evaluating the long-list options

## 3.2 Defining the short-list option

The purpose of the Catalyst was developed through the Strategic Assessment and indicative business case, and confirmed in the Strategic Case above. The short-list options explore remaining choices around the scope of services the Catalyst could offer, and activities it could perform. It is vital the Preferred Option addresses market gaps, avoids service duplication and is sustainable over the long term, both from operational and funding perspectives.

### Status Quo

A Status Quo scenario would represent a missed opportunity for New Zealand to grow a strategic high value-add export sector. Without the Catalyst, there will be no entity to deliver dedicated horticulture technology-focused services. If funding is deferred or not approved, the credibility of the Agritech ITP and the broader ITP programme may suffer, as industry may question the commitment to transformation by its government partners. This may make it more difficult for government to gain industry buy-in to broader involvement with, and specific action and priorities delivered through, the Agritech ITP programme. If the Catalyst is not funded the pilot programmes tested to-date will not continue in their collective form, as Agritech ITP funding, currently supporting the pilots, ceases in June 2024. Activities to be funded through the ITP's FY2023/24 contingency are yet to be scoped up, agreed, and procured.

Industry impact will be difficult to achieve, given there will be no priority focus on horticulture technology. New Zealand technology companies with the capability and initiative to develop technology solutions to benefit the horticulture sector will likely struggle to connect with growers to tailor and test ideas, achieve scale and attract investment.

### Option A: Catalyst Light – Industry Connector

Industry connector services and activities are offered by a light-touch Catalyst – essentially a do-minimum option. The Catalyst would better connect existing government services and play a facilitating role between technology companies, funding providers, and domestic and international commercialisation partners. The Catalyst would be delivered virtually but would still have a presence in key growing regions through working alongside industry players.

### Option B: Catalyst – Targeted Services

The Catalyst would deliver more expanded services than Option A. It is more than a connector – it would deliver a range of services across industry talent development and in relation to project facilitation and commercialisation support. Stakeholders have indicated industry talent development is key to building resilience and skills, and targeted project facilitation and workshops would assist directing organisations to the right support. Per Option A, this would focus on the horticulture technology sector and would be delivered virtually.

### Option C: Catalyst Plus

This option delivers the widest range of services to horticulture technology companies, and duplicates some services already existing in the market. In this option, the Catalyst would also be directly involved in owning commercialisation activities, and hold intellectual property, as well as house a full education academy. In addition to entering leasehold arrangements with current like-minded companies and organisations in key regions, the Catalyst would also develop a purpose-built facility, which would act as the central hub. The services scope, one of the key differentiator dimensions, is compared across the options below:

**Table 17: Services under each option**

| **Service Groups** | **Key Services** | | **Option A** Catalyst Light: Industry Connector | **Option B** Catalyst: Targeted Services | **Option C** Catalyst Plus |
|---|---|---|---|---|---|
| **Industry Connector** | Industry Connector | | ✓ | ✓ | ✓ |
| **Industry Talent Development** | Delivering industry placements and student development opportunities | | | ✓ | ✓ |
| | Formal post-graduate qualification | | | | ✓ |
| | Executive commercialisation training for technical staff | | | | ✓ |
| | Real-world horticulture training programmes for technical graduates | | | | ✓ |
| **Project facilitation and commercialisation** | Project Facilitation | Facilitation of technology workshops and specialist support | | ✓ | ✓ |
| | | Funding and investment access support | | ✓ | ✓ |
| | | Commercialisation advice | | ✓ | ✓ |
| | Ownership of IP and the commercialisation process | | | | ✓ |
| | Incubation & accelerator services | | | | ✓ |

### Counterfactual

The Counterfactual provides a likely 'future state' if decision-makers decide not to proceed with the Preferred Option. This option provides a comparator for testing the public value of the Preferred Option.

The Status Quo has been adopted as the counterfactual. If the Catalyst is not funded the Catalyst is not established and its services are not provided by government or industry, and the pilot programmes tested to-date will not continue in their collective form as Agritech ITP funding, which has helped to support the pilots over the 2022 calendar year, is available only until June 2024. While there may be some funding available in FY2023/24, this funding has yet to be allocated across the broader set of Agritech ITP initiatives, therefore there is no allocated funding from June 2023. This was determined through the long-list assessment to not be a viable option, as it does not contribute to the investment objectives. It would mean there is no new cost to cover and no net-new benefits. The Status Quo has been included as a comparator for other options in the short-list.

## 3.3 Identifying the Preferred Option

The short-list options were assessed to determine a Preferred Option. Each short-list option was assessed against its ability to meet investment objectives, realise benefits, and mitigate risks, alongside the whole-of-life cost (WOLC).

The assessment weights investment objectives, benefits, and risks equally, to generate a numerical score. Options were ranked according to this.

#### Investment Objectives Assessment

The investment objectives are used in the long-list and short-list assessments. At this step of the assessment, they are used to explore more nuanced features of the options, and the extent to which each option delivers on the objectives sought, compared to the Status Quo. All investment objectives are weighted equally.

#### Benefits Assessment

The short-list options were tested against the three, non-monetary benefits identified in the Strategic Case. These were agreed to have an equal weighting of 33.3%. Each option was assessed as to how well it provided a benefit compared to the Status Quo.

**Table 18: Benefits**

| # | Benefit | Description |
|---|---|---|
| 1 | Innovation among horticulture technology companies is accelerated (33.3%) | Accelerated innovation will lead to horticulture technology being developed, brought to market, and scaled quicker, leading to growth in horticulture technology companies and the sector. |
| 2 | Greater connectivity leads to improved access to horticulture technology and enables greater production for the domestic horticulture sector (33.3%) | Greater connectivity and collaboration enable innovators to create new and more bespoke technology. The Catalyst will also build knowledge and awareness of existing and opportunities for new innovations across the horticulture ecosystem, to drive technology developers to match industry problems with solutions. |
| 3 | Exports of horticulture technology grow (33.3%) | Technological skills and knowledge are learned and shared more effectively between different players in the industry, helping to drive innovative technology solutions, and ultimately resulting in higher export opportunities.<br>More opportunities will increase horticulture technology revenue, and help create jobs opportunities through company growth and improved earnings for those involved. |

## Risk Assessment

Five risks were identified in advance of the short-list assessment. These have been assessed and rated for each option to determine a risk profile as part of the overall assessment. All risks are weighted equally and are captured in the assessment table.

These risks are:

- Low levels of industry uptake and buy-in
- Investment risk – lack of public funding (long-term and seed)
- Lack of skill
- Delivery risk
- Duplication of, competition between, and/or lack of coherence across services and providers

## Short-list Assessment Summary

Table 19 shows the net-value assessment of the short-list options, against investment objectives, benefits, and risks. This is quantified as a Net-Value Score in Table 20.

**Table 19: Short-list Options**

| Short-list Options | Status Quo | Option A **Catalyst Light:** Industry Connector | Option B **Catalyst:** Targeted Services | Option C **Catalyst Plus** |
|---|---|---|---|---|
| **Investment Objectives** | | | | |
| Positioning New Zealand as a world leader in horticulture technology | Does Not Meet | Somewhat Meets | Strongly Meets | Strongly Meets |
| Enabling commercial partnership, resulting in the commercialisation of IP | Does Not Meet | Partially Meets | Strongly Meets | Strongly Meets |
| Providing the interface between market participants and enhancing collaboration | Does Not Meet | Strongly Meets | Strongly Meets | Strongly Meets |
| Delivering on the vision of the Agritech ITP | Does Not Meet | Somewhat Meets | Strongly Meets | Strongly Meets |
| **Benefits** | | | | |
| Exports of horticulture technology grow | Nil Contribution | Low Contribution | Moderate Contribution | Moderate Contribution |
| Innovation among horticulture technology companies is accelerated | Nil Contribution | Low Contribution | Moderate Contribution | Moderate Contribution |
| Greater connectivity leads to improved access to horticulture technology and enables greater production for the domestic horticulture sector | Nil Contribution | Low Contribution | Moderate Contribution | Moderate Contribution |
| **Risks** | | | | |
| Low levels of industry uptake and buy-in | N/A* | Low Risk | Low Risk | Moderate Risk |
| Investment risk – lack of public funding (long-term and seed) | N/A* | Low Risk | Moderate Risk | High Risk |
| Lack of skill | N/A* | Low Risk | Moderate Risk | High Risk |
| Delivery risk | N/A* | Low Risk | Low Risk | High Risk |
| Duplication of, competition between, and/or lack of coherence across services and providers | N/A* | Moderate Risk | Moderate Risk | Moderate Risk |
| **Net Value Ranking** | - | 3 | 1 | 2 |

* The status quo was not assessed against risks, as they are applicable to a future state with a Catalyst, rather than without

## Net-Value Assessment

The Net-Value Assessment was used to calculate a Net-Value Score for each short-list option. Short-list options were assessed against their ability to:

- Meet ***investment objectives*** on a scale of score of 0 to 4, where zero means an option does not meet investment objectives and four means the option meets investment objectives to the greatest extent.
- Realise ***benefits*** on a scale of 0 to 4, where zero represents no contribution to the benefit, and four represents maximum contribution to the benefit.
- Pose ***risks*** on a scale of 0 to 3, where zero represents a high risk, and three represents no risk. Risk scoring was then converted to a 0-to-4 point estimate to align with investment objectives and benefits scoring.

Overall scoring has then been converted to a 0 –100 range. The Net-Value Score for each option is shown in the table below, where 0 is the lowest possible score an option could generate and 100 is the highest possible score.

**Table 20: Net-value assessment**

| Net-value Assessment | Status Quo | Option A<br>Catalyst Light: Industry Connector | Option B<br>Catalyst: Targeted Services | Option C<br>Catalyst Plus |
|---|---|---|---|---|
| **Investment Objectives** | 0 | 19 | 33 | 33 |
| **Benefits** | 0 | 8 | 25 | 28 |
| **Risks** | N/A | 29 | 21 | 8 |
| **Net-Value Score** | **0** | **56** | **79** | **69** |
| **Qualitative Assessment Ranking** | **4** | **3** | **1** | **2** |

From a net-value perspective, Option B delivers the highest overall score and is the most favourable option. Option B provides services where there are gaps in the market and prioritises collaborative working across key areas to best support the industry as a whole. This in turn improves industry connectivity and amplifies the connector function to help companies commercialise ideas and work alongside growers to solve real-world problems. Option B meets the greatest market need, while also being an affordable and achievable option in the short and long-term.

Option C ranks lower than Option B, largely because the broader scope of services is likely to add risk of more duplication and confusion for companies in the market – and might not be effective engendering collaboration. In addition, this option requires greater resourcing and expertise to provide the range of services, and the size of the investment required.

Further, as Option C includes construction of a building to act as the flagship site and main office of the Catalyst, the scale of the investment is less attractive, particularly in the current inflationary environment where government funding is constrained. Option C also has a greater risk in relation to delivery and achievability as it requires more specialist knowledge and expertise to deliver a wider range of services. While infrastructure construction and standing up new services are a core part of government business and not outside the realms of possibility, Option C may be less likely to be self-sustaining in the long-term, compared to Options A and B.

While Option B and Option C both contribute significantly to the Investment Objectives, Option C (offering significantly more services) would be challenging to deliver in a cohesive manner in the short-term.

Some of the services outlined in Option C, if offered, would likely lead to duplication and overlap within the existing ecosystem. Under Option C, housing an institution offering formal qualifications would also be a large undertaking, and require significant investment: tailored post-graduate training may be best suited to an established provider.

Since the endorsement of the indicative business case, there have been significant shifts in both the economic and fiscal environment, nationally and internationally. This is increasingly placing pressures on public sector spending decisions, particularly in an environment of increasing interest rates and inflation giving further justification for Option C being discounted as it requires greater funding to deliver.

The Status Quo option performs poorly in comparison with the other options, as it will not contribute further towards the investment objectives and does not contribute to identified benefits.

## Whole of Life Cost

The public value delivered for the scale of investment is an important consideration in determining the Preferred Option. The whole-of-life cost (WOLC) of each short-list option was assessed in regard to cost to deliver. The estimated WOLC and capital expenditure required (relevant for Option C) for each option is shown in Table 21.

**Table 21: Estimated WOLC and capital expenditure**

| **Options** | **Status Quo** | Confidential advice to Government | **Option B Catalyst: Targeted Services** | Confidential advice to Government |
|---|---|---|---|---|
| Operating Expenditure (nominal) | - | | $29.9m | |
| Capital Expenditure (nominal) | - | | - | |
| **Total Expenditure** (nominal) | **-** | | **$29.9m** | |
| **WOLC*** | **-** | | **$56.5m** | |
| **Cost Ranking** | **-** | | **2** | |

* WOLC has been discounted and expressed as a present value in 2023 dollars

The estimated WOLC for each short-list option is the discounted cash costs of the investment over its useful life which covers:

- A four-year period, aligned with establishment of the Catalyst and ramp up in operations.
- A steady-state of operations from year 5 onward, over a 10-year period overall (until 2032/2033).

Cash costs included in this investment comprise:

- One-off operating expenditure to establish the Catalyst.
- Ongoing cash operating expenditure.
- Capital expenditure and ongoing allowance for capital maintenance of the Catalyst building, under Option C.

A discount rate of 5% has been used to calculate WOLC in present value terms.

## Assessment results

Option C has the highest cost, as a result of the large number of FTEs required to provide the range of services, and it also requires significant capital outlay in building a bespoke facility.

Capital expenditure cost for Option C is driven by the construction of a new central hub – as opposed to leasing or co-sharing – and technology and talent required for delivery of services. While a new, purpose-built facility could be advantageous – a key feature of Option C – an infrastructure investment of this nature could limit the Catalyst's ability to deliver more nuanced, targeted, and appropriate services to users. The project team has taken on board feedback from stakeholders regarding the need to work closely with existing businesses, and to collaborate as much as possible. A single, new facility could run counter to this and, in addition, is a significant capital outlay.

This also means that while Option C (Catalyst Plus) is included in the short-list options, there is a stronger justification for this is not considered the value for money option, given the higher cost to deliver in this constrained, inflationary environment.

Option A still incurs costs, including FTEs to deliver the connector function and support the establishment operations, the set-up of a digital presence and tools as enablers of the service, in addition to stakeholder engagement and brand development.

The difference in operating expenditure between Option A and Option B is driven by the higher Catalyst FTE resources under Option B, as well as the contracted services needed to deliver the additional two service areas. While the WOLC of Option B is greater than Option A, it delivers a higher net-value score based on the qualitative assessment of the outcomes and benefits it would achieve (offset by identified risks), and is more affordable than Option C. While Option A is cheaper, stakeholders indicated the Connector function alone is unlikely to achieve the benefits to the same degree as Option B and would not offer enough differentiation from other market participants.

The intended services were tested in the Service Validation process and through engagement with the Industry Reference Group and ITP Māori Advisory Group, helping validate key services and refine the services scope of the Preferred Option. This process is outlined in Appendix 5.

**Table 22: Overall assessment summary**

| **Options** | **Status Quo** | **Option A** Catalyst Light: Industry Connector | **Option B** Catalyst: Targeted Services | **Option C** Catalyst Plus |
|---|---|---|---|---|
| **Net Value Score** | - | Confidential advice to Government | 79 | Confidential advice to Government |
| **WOLC** (discounted) | - | | $56.5m | |
| **Ranking** | - | | **1** | |
| **Result** | **Discounted** | | **Preferred Option** | |

Under the Status Quo, there is no cost, as no funding is allocated to establish and operate the Catalyst. The net-value score of each option (refer Table 20) needs to be weighed up against costs (refer Table 21) to provide an overall assessment, summarised in Table 22.

## 3.4 The Preferred Option

Option B (Catalyst – Targeted Services) is the Preferred Option. Option B meets investment objectives, delivers the desired benefits, and is comparatively affordable. It is considered to optimise public value for the Horticulture Technology Catalyst.

As summarised in the Service Validation (refer Appendix 5,) Option B, and the services it offers, has been endorsed by industry stakeholders as the Preferred Option.

The need for the Catalyst is also supported by the economic impact assessment outlined in section 3.5, which shows the value to New Zealand the Preferred Option could generate, across GDP impact, export growth and job creation.

### Uncertainty and risk

The project team has considered uncertainties when developing cost estimates. The Financial Case describes the cost risks considered across:

- Procurement
- Design specifications and scoping
- Complexity and innovation

The Financial Case also describes how these have been accounted for through appropriate levels of contingency. Material risks, beyond those normally experienced from establishment and procurement perspectives are outlined in detailed in the Management Case.

### Benefits optimism bias

There is also the potential for optimism bias in relation to benefits. An economic impact assessment was conducted in 2021 (refer section 3.5 and Appendix 6), that analysed the GDP impact the Catalyst could have. This catered for bias by developing three scenarios for the Catalyst's impact – low, medium and high. Even under the "low" scenario, the Catalyst's potential impact is sizeable ($141 million increase in GDP in present value terms), sufficient to justify its development, and is more than the whole of life cost of the Preferred Option.

The risks around optimism bias are not considered to have any impact on the relative rankings of the short-list options.

## 3.5 Economic impact of the Catalyst

To understand the economic impact of the Catalyst on the New Zealand economy, economic modelling was undertaken in 2021, to support the indicative business case and provide a view of the value the Catalyst could generate. While the scope of the Preferred Option remains broadly the same, some assumptions and aspects of the delivery scope have been refined since modelling was undertaken (e.g. a virtual delivery mode and the scale of the future service contracts).

Economic modelling was based on a possible set of future scenarios. A Computable General Equilibrium (CGE) model was used to estimate the potential impact of the Horticulture Technology Catalyst based on three scenarios out to 2035.

Based on the information and assumptions provided by the Catalyst project team, the CGE modelling showed the Catalyst has the potential to generate substantial positive economic impacts for New Zealand's economy, and could contribute between $141 – $347 million to national GDP, including $46 – $ 94 million to exports from establishment of the Catalyst until 2035.

**Table 23: Potential economic impact**

| Catalyst Scenario | National GDP | | National Exports | | National Employment | |
|---|---|---|---|---|---|---|
| | Present Value 2022-2035 | Peak year GDP (year 2035 $m) | Present Value 2022-2035 | Peak year GDP (year 2035 $m) | Average FTEs | Peak year FTEs |
| **Low** | $141.0 | $48.8 (2035) | $46.6 | $24.7 (2035) | 128 | 307 (2035) |
| **Medium** | $217.5 | $78.8 (2035) | $68.8 | $36.5 (2035) | 184 | 457 (2035) |
| **High** | $347.1 | $126.1 (2035) | $94.0 | $49.8 (2035) | 271 | 672 (2035) |

The Catalyst management could seek to retest the actual to-date and forecast economic impact, periodically over the of the Catalyst as a measure of performance. More information on the scenario and results is outlined in Appendix 6.

## 3.6 Horticulture Technology Catalyst – What will Option B deliver?

The Catalyst will enable stronger collaboration across the industry, empower the industry to be innovative and support organisations in their drive towards technology adoption and commercialisation opportunities. The diagram below shows the three key groups of services the Catalyst will deliver.

**Figure 22: Key Services**

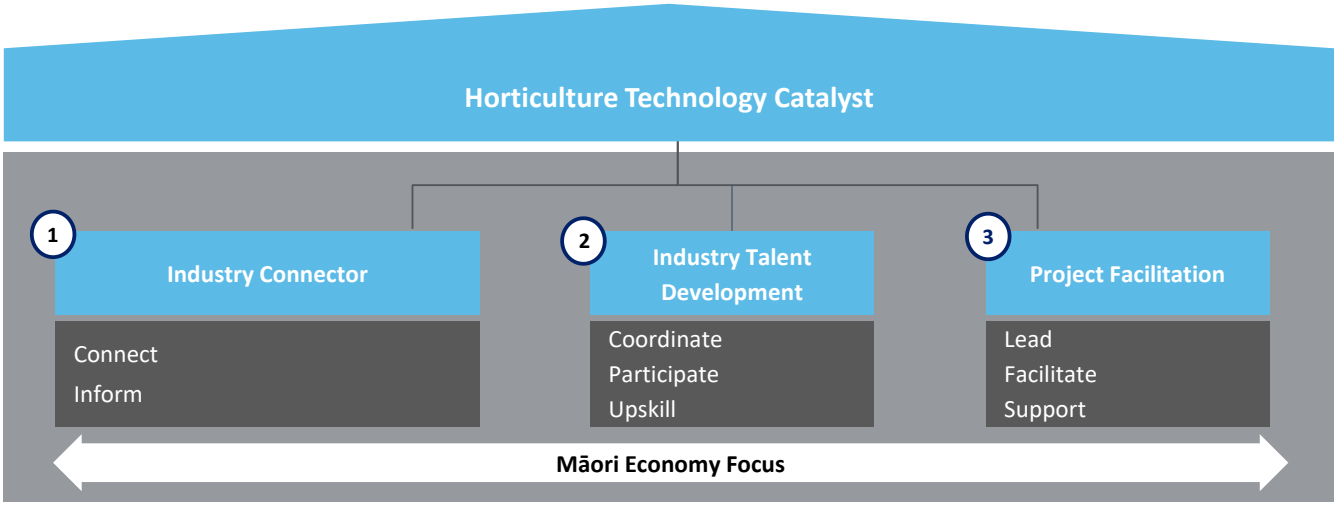


**Table 24: Purpose and scope of services**

| Service | Role | Purpose | Scope |
|---|---|---|---|
| **Industry Connector** | Connect & inform | To enable stronger collaboration and connectivity across the industry, and provide awareness of innovative solutions, while helping to match needs with solutions. This service will connect the New Zealand hort-tech ecosystem to global opportunities, helping to showcase products and prototypes to both the local and international markets. | Connector builds groundwork for and supports the development of local and international partnerships. It will run targeted industry events specific to the horticulture sector, and ultimately help build, and bridge, the horticulture technology community, and provide access to networks of early adopters of horticulture innovation and technology to support testing and piloting horticulture technology solutions, in addition to leveraging other technologies. The connector function will also develop and leverage tools (such as a funding navigator and industry directory) accessible online.<br>The scope will focus on providing industry intelligence and insights, through communicating information on global market demand and trends, research initiatives, technology solutions under development, and global insights to help create funding and research alignment. It will allow stories of capability across the sector to be shared and recognised, creating awareness of what technology is available, or will be in the near future. |
| **Industry Talent Development** | Coordinate, participate & upskill | To facilitate training for the next generation of thinkers and innovators who want to get 'dirt on their hands' understanding the industry and working closely with those growing and packing produce. This service will act as an interface between industry and education institutions to ensure educational alignment. | The Catalyst will work with the industry to facilitate secondment opportunities; it will not establish and run these workplace or internship roles. The Catalyst will also work with higher education and tertiary institutes to guide students into horticulture technology opportunities, both on- and off-orchard, potentially through commercialisation trials when available. Capability programmes and business training, relating to either technology relevant to growers or basic business hygiene support, will be designed and prioritised during the establishment phase. |
| **Project Facilitation** | Lead, facilitate & support | To facilitate partnerships – through introductions, advice, and project support – to break down barriers to commercialising innovation and technology and enhancing the maturity of the industry, and to make it easier for industry participants to navigate technological challenges and the web of funding and assistance available. | This can include providing advice on best practice commercial arrangements for future partnerships, and helping organisations access public funding and navigate capital raise challenges by directing them to existing funding support pathways. It will ensure there are technology workshops and webinars specifically targeted to the sector.<br>The Catalyst does not aim to duplicate the activities of existing accelerators, incubators, or university-led commercialisation programmes. It will not lead commercialisation ventures or own commercialised technology or intellectual property, and it is not seeking to offer grants or funding directly.<br>Project facilitation will also build off the other two service pillars, leveraging connections to global investors, technology companies and growers as customers. |

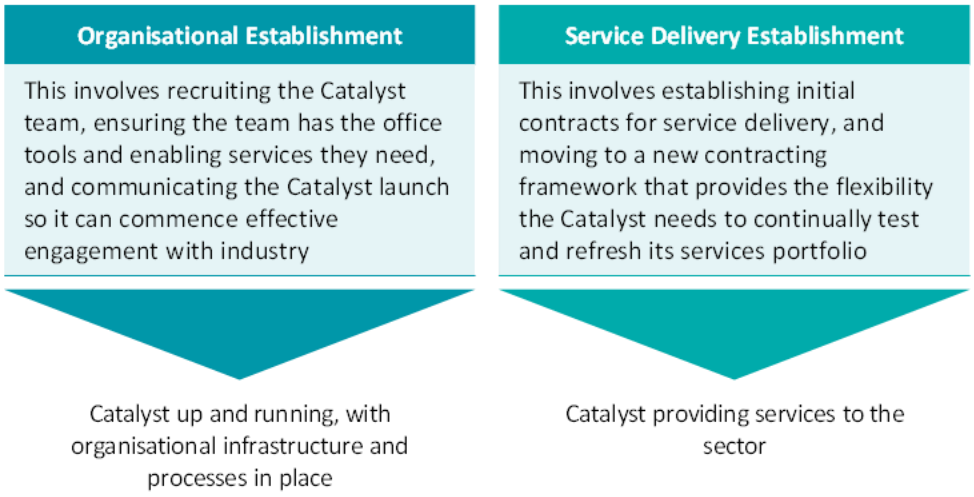
# 4 Commercial Case

## 4.1 Procurement Overview and Approach

### Overview

This Commercial Case outlines the commercial approach for the investment. There are two distinct streams of procurement:

**Figure 23: Procurement model**




### Overarching principles, approach and policies

All procurements will be carried out in alignment with the principles of government procurement, as set out in the Government Rules of Sourcing and Procurement Guidelines.

MBIE's own specific procurement policies will be applied and followed as appropriate. This includes leveraging MBIE's organisational procurement teams and established supplier panels where practical.

The procurement strategy for Catalyst service delivery is to collaborate and partner with a range of Crown entities that already have specific experience and track records in delivering similar services, and particularly those already involved in the ITP. This is expected to cover the majority of services over the first 12-18 months of Catalyst operations and would be supplemented by further procurements and commercial relationships as required.

The strategy and approach are intended to optimise the Catalyst's responsiveness and agility, so it can:

- Be established with an operational team by the second quarter of 2023/24
- Provide a modest level of service delivery to industry during its establishment phase, building on (and continuing) pilot activities that have already been delivered through the ITP
- Rapidly design, develop, pilot and test service activities as it builds (and continually refreshes) its services portfolio

## 4.2 Organisational Establishment

### Professional Services

Establishing the Catalyst may require a range of professional services, such as:

- Recruitment and talent search
- Financial, accounting, economic and legal advice
- Communications, branding and design
- Service planning and design
- Digital presence: channel and online services platform

Any such services will firstly be provided by incumbent MBIE arrangements, or procured via MBIE's existing All of Government and preferred provider panels, and in consultation with relevant MBIE functional teams.

### Office equipment

Team accommodation, office and ICT equipment/infrastructure will be sourced through MBIE's normal processes and providers, led by relevant MBIE functional teams.

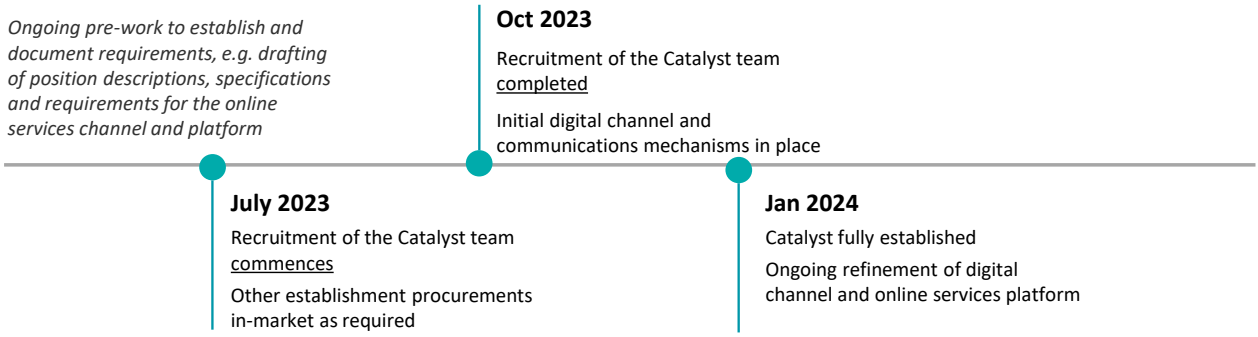
### Digital channel and online services platform

The initial scope and requirements for this will be developed collaboratively within the multi-agency ITP team. This includes consideration of similar platforms being used in other economic development settings (e.g., the Health Tech Activator) to ensure learnings are taken into account.

There are existing agritech related tools, such as the Agritech Knowledge Hub and Agritech Support Explorer, which could be added to and customised for Catalyst customers.

All initial procurements required for organisational establishment are expected to be below $500,000 in value.

**Figure 24: Organisational establishment timing**



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# 5 Financial Case

## 5.1 Investment Summary

*This Financial Case summarises the affordability and funding arrangements for implementing the Preferred Option - Option B: Targeted Services.*

### Approach to Financial Analysis

Financial modelling and analysis underpinning this case was developed to forecast annual operating expenditure.

- A financial model was developed to support the business case and provide a consistent approach to determining operating requirements. The financial model includes cashflow forecasts for the implementation period.
- The financial model was developed using a four-year time horizon, commencing 1 July 2023 and ending on 30 June 2033, for ongoing costing purposes.
- The Financial Case forecasts focuses on the first four years of Catalyst establishment and operations, where years three and four reflect the steady state. The WOLC in the Economic Case is based on a 10-year lifecycle.
- The project team's key drivers and assumptions determined the scale of operations required, including a small but dedicated team to manage the Catalyst, as well a range of contracted services and other costs such as establishment activities, and developing a digital presence.

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- All costs are assumed to be operating costs, including those related to technology, such as website development. Therefore, there are no Balance Sheet impacts from this investment. There is no depreciation or capital charge expense.

### Total Expenditure Summary

The total cost of the Preferred Option is estimated at $29.9 million over four years. The below table outlines expenditure of this investment over time.

**Table 25: Total expenditure ($ millions nominal)**

| Investment Expenditure ($m) | 2023/24 | 2024/25 | 2025/26 | 2026/27 & outyears | Total |
|---|---|---|---|---|---|
| **Operating costs** | | | | | |
| Leadership and Management | 1.31 | 1.81 | 1.86 | 1.90 | **6.88** |
| Contracted Services | 3.73 | 5.43 | 5.52 | 5.61 | **20.28** |
| Digital Presence and Tools | 0.4 | 0.05 | 0.05 | 0.05 | **0.5** |
| **Capital costs** | – | – | – | – | – |
| **Contingency** | 0.52 | 0.56 | 0.57 | 0.59 | **2.24** |
| **Total** | **5.91** | **7.85** | **8.00** | **8.15** | **29.9** |

## Drivers of Key Costs

Net-new Catalyst personnel roles and service-based resourcing requirements are some of the key drivers used to estimate costs.

The key cost categories considered from a financial perspective are outlined in the table below. As per short-list option costs in the Economic Case, these include personnel costs and related operating costs, and upfront costs relating to digital presence, as well as ongoing costs to maintain this. Costs in the Financial Case have been presented on a phased basis and are shown in nominal terms.

**Table 26: Key cost categories**

| Cost Category | Description |
|---|---|
| **Leadership and Management** | Catalyst Personnel and Overheads: This cost provides for 7.0 FTEs required to manage, operate and ensure the successful planning and contracting of Catalyst services and activities. |
| **Contracted Services** | Cost of delivering services outlined in the Strategic and Economic Cases, through service-based contracts with third parties eg. NZTE, Callaghan Innovation. The scale of collective contracted services is based on an assumed resource proxy – that is, the equivalent number of FTEs needed to provide sufficient resourcing to deliver a service in its entirety. This estimate was then benchmarked against existing inter-agency contracts, such as KiwiSaaS, and the HealthTech Activator, as they deliver services of a comparable nature and scale, to provide an appropriate sense check. The resource/FTE proxy and quantum was also considered a valid approach, based on cost-recovery service agreements in place to deliver pilot services under the ITP. |
| **Digital Presence and Tools** | This includes an interactive web-based platform, as well as promotional tools such as video-based materials. It is assumed the cost to deliver this is relatively small, and again has been benchmarked against digital investments of a similar nature (e.g. Agritech Knowledge Hub, Agritech Support Explorer). |

### Cost breakdown

Total costs are illustrated in further detail in the following table. Core contracted services represent the bulk of the cost to deliver the services and are based on a proxy scale of FTE resources required to deliver the service scope. Supporting operating costs include those outside of the day-to-day time applied to service delivery, including ongoing activity design, planning and evaluation costs, new overhead costs, administration, and other support costs. Other costs include establishment costs, such as brand set-up and initial communications, to be delivered under the Industry Connector function, as well as specific event costs which may include venue hire and travel costs.

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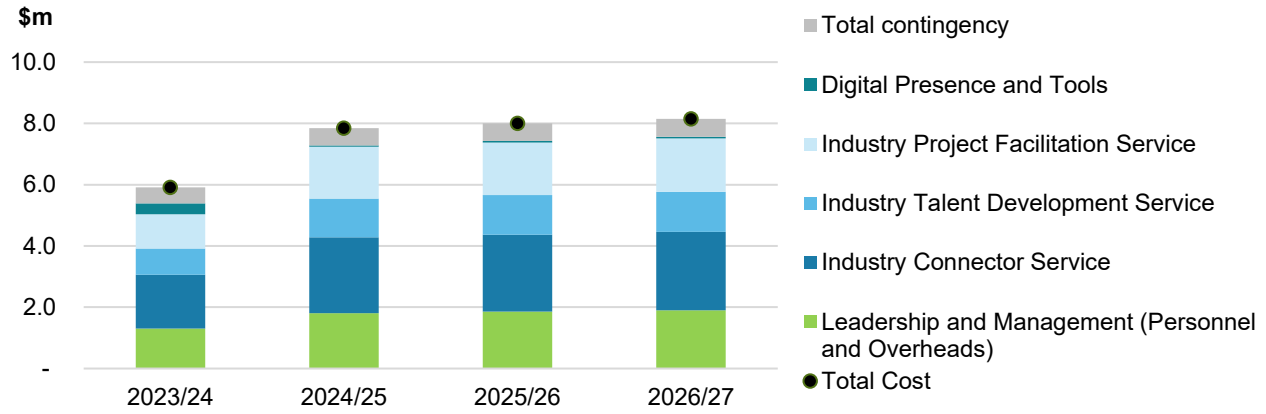
### Phasing

Service delivery drives cost phasing, and is illustrated on the chart below. Operations are to ramp up over the first two years and move into a steady operating rhythm thereafter.

**Table 28: Expenditure phasing ($ millions nominal)**




## 5.2 Key assumptions

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## 5.3 Funding and Affordability

Total funding required to deliver the Preferred Option is currently estimated at $29.9 million for both upfront establishment costs and ongoing operational costs for the period July 2023 to June 2027. This funding is to support net-new activity with a horticulture technology focus, not currently delivered by the organisations which have developed and/or supported this business case. The Horticulture Technology Catalyst Budget bid is also seeking baselined funding for outyears.

## 5.4 Funding Sources

New funding required over the first four years for establishment and early years of operations is currently estimated at $29.9 million.

Through the Agritech ITP, Government and industry committed to develop this business case to explore the worth of a Horticulture Technology Catalyst. The Catalyst is a high impact project under the Agritech ITP, which makes it a flagship project to measure the ITP's impact and success. The Catalyst's development has been funded through the ITP's broader funding provided through Budget 20 ($10.4 million across the ITP to enable its delivery).

While this funding enabled the development of the Catalyst (through delivery of this business case as well as piloting potential service activities), the Catalyst is one of a number of priorities across the ITP to be delivered through the ITP's funding and the ITP's expectation from the outset has been that, if the Catalyst were to be established, it would require new Government funding. A Budget 23 bid has therefore been submitted to seek ongoing funding for the Catalyst.

At this point, this investment is not expected to result in any cost savings for MBIE, Callaghan Innovation, NZTE or MPI. Even though the Catalyst will help streamline services, and direct customers to existing service pathways, the service activities will be designed to ensure there is no duplication, meaning activities conducted are net-new to the current ecosystem in relation to services targeted at the horticulture technology industry.

**Table 29: Operating required ($ millions nominal)**

| Operating required | 2023/24 | 2024/25 | 2025/26 | 2026/27 & outyears | Total |
|---|---|---|---|---|---|
| New operating required ($m) | 5.91 | 7.85 | 8.00 | 8.15 | **29.90** |

At this stage, core services will be provided directly through new government funding. While industry participants will meet some costs (e.g. in relation to travel and events) no cost recovery from industry for core services is being recommended, particularly due to the profile of firms in the horticulture technology sector, which is mostly comprised of relatively small firms. In line with similar events run by participating agencies, the Catalyst will seek to charge nominal fees for customers to attend industry events. These will be set at an appropriate price to enable affordable access, and with the aim of understanding event size and ensuring good behaviour (e.g. organisations not pulling out last minute) and will only provide a very small scale of income to contribute towards the cost of running the event. All costs captured in the cost model are assumed over and above that which could be recovered through nominal event fees.

The Catalyst will continually identify opportunities to develop and deliver new services, and this may include consideration of services fully or partially cost-recovered in the future.

## 5.5 Approach to quantification of risk and uncertainty

As a low risk and small-scale business case, BBC guidelines require a light analysis approach to quantify risk and uncertainty. The recommended approach is a single-point probability analysis; however, for the purpose of this business case, a more sophisticated Optimism Bias approach has been used. This approach applies separate risk profiles for cost categories and for various risks factors.

### Key drivers

Quantification of risk and uncertainty has been determined with consideration of key contributory factors driving optimism bias, from both a cost and timeframe perspective, as per UK guidance (*Supplementary Green Book Guidance: Optimism Bias*, HM Treasury UK).

In addition to the identification of risks for the purposes of determining the preferred option, the following key drivers have been considered:

**Table 30: Key factors driving uncertainty and risk**

| Key factors | Description | Explanation |
|---|---|---|
| **Procurement** | Contracting complexities, supplier capabilities and information management | While public sector staffing benchmarks have been used to Catalyst personnel costs, sufficient budget is required to ensure the right talent can be attracted into key leadership roles to drive Catalyst activities.<br>MBIE has ample experience in contracting providers for services of this type. While these are known service providers, the preferred provider to contract for the development of the Catalyst's digital presence and tools is yet to be determined. |
| **Design specifications and scoping** | Nature and scope of services and IT-based design, and detailed developed to date | Detailed specification and design for the digital presence and tools that will support the Catalyst will be completed during the implementation phase. However, the risk of cost escalation due to poor scoping is relatively small given there isn't a large digital component to this investment, and comprises less than 2% of the overall investment. |
| **Complexity and innovation** | Complexity of the planning, piloting, evaluation and implementation work to be completed | There is some complexity in relation to sourcing and hiring the right people to lead and manage the Catalyst, given current labour market shortages across most industries in New Zealand. These are the core roles which would undertake the scoping of the contracted services, as well as performance evaluation. In relation to the services themselves, cost or demand pressures are expected to be managed by trading off and prioritising activities across all three services. |

### Contingency

Contingency of 8.1% has been applied on total costs, comprising risk profiles for the Catalyst personnel, contracted services, and investment in digital presence. The following contingency rates were applied to cost categories:

**Table 31: Applied contingency rates**

| **Leadership and Management** (Catalyst personnel and overheads) | **Contracted Services** | **Digital Presence and Tools** | **Relative Contingency Rate** (To total cost) |
|---|---|---|---|
| **15 %** | **5%** | **40%** | **8.1%** |

## 5.6 Other considerations

### Funding industry projects

The Catalyst is not expected to either fund industry projects or take the role of an investor. While part of the Catalyst's budget will be allocated to support projects, this spend could entail the procurement of specialist services such as financial modelling to support the development of business cases or information memoranda to attract investors. It could also be used to support the industry to connect with early adopter networks to enable product testing, which could incur transportation costs to ship technology throughout the country or overseas. These costs may be incurred as part of the process of supporting commercialisation, however the Catalyst is not expected to directly fund the research or development of technology solutions.

An agritech venture capital fund has been established as a separate initiative under the Agritech ITP to address the gap in early-stage capital funding for the sector.

# 6 Management Case

The Management Case demonstrates the achievability of implementing the Preferred Option (Option B: Catalyst – Targeted Services) and summarises arrangements for successful delivery.

## 6.1 Introduction

The project has been assessed as low risk through the Risk Profile Assessment process. The scale and scope of the Catalyst is well within existing capabilities of MBIE and partner agencies involved in the ITP. However, it does represent change and success of the Catalyst will require effective establishment planning and activities, and collaboration between MBIE, the service providers and advisory groups.

## 6.2 Catalyst Governance, Management & Delivery Structure

### Governance, Management & Delivery Model

The Catalyst project structure, outlined in the following figure, is designed to ensure decisions are made at the appropriate level and provide continuity through the establishment and delivery of the Catalyst. In general, the ITP Steering Group sets the long-term strategic direction for the ITP, including the Catalyst. MBIE Senior Management provides governance and oversight for the Catalyst and holds ultimate accountability for the Catalyst's operational and financial decision making. MBIE Senior Management delegates operational decisions to the Catalyst Director, who in turn delegates to the Programme Manager.

An Establishment Working Group (EWG) will operate through the pre-establishment phase, and into the establishment phase of the Catalyst, and is responsible for standing up the Catalyst. The EWG will comprise key officials and project staff from MBIE and ITP partner agencies. It will evolve through the establishment process to be replaced by the Catalyst team, once recruited.

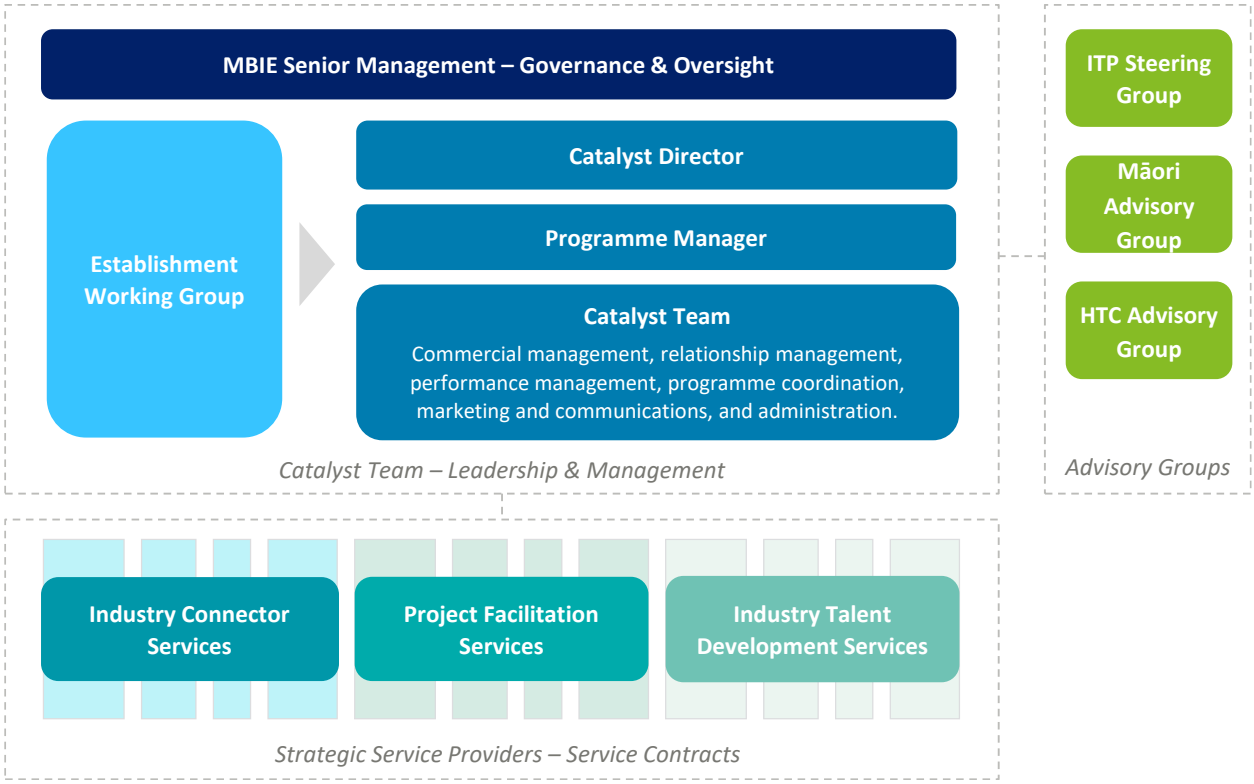
The EWG and Catalyst team will draw on MBIE's existing organisational infrastructure including:

- Programme, Evidence and Insights team
- Policy teams
- Strategic Communications
- HR and Recruitment

Throughout the establishment and delivery phases of the Catalyst, the ITP Steering Group will have input on key decisions that are longer-term and strategic in nature. The group will receive reporting on service scoping and prioritisation, to test strategic fit.

The two advisory groups will provide input into the strategic direction of the Catalyst, helping to ensure this takes account of their respective stakeholder perspectives and needs. This will be across service demand, priorities and design, evaluation / feedback on services and the Catalyst's customer experience. The Māori Advisory Group provides appropriate Māori representation on the interests of Māori in relation to agritech and horticulture technology. This group has been in place since October 2022, and the Māori Engagement approach is summarised in more detail in section 6.5 below. The HTC Advisory Group will bring broad industry representation to the Catalyst.

**Figure 28: Catalyst governance and management structure**




The structure is illustrated in the diagram above, showing MBIE Senior Management with overall governance accountability through pre-establishment and ongoing operations, the EWG transitioning to the Catalyst team once recruited/appointed, and the three advisory groups that will provide input through pre-establishment and ongoing operations.

Appendix 9 summarises the refinement of the Catalyst Delivery Model since the IBC.

## 6.3 Catalyst Service Design & Life Cycle Management

The following diagram shows the process to support planning of Catalyst activities to deliver, prioritise and refine over time through ongoing feedback and impact assessment.

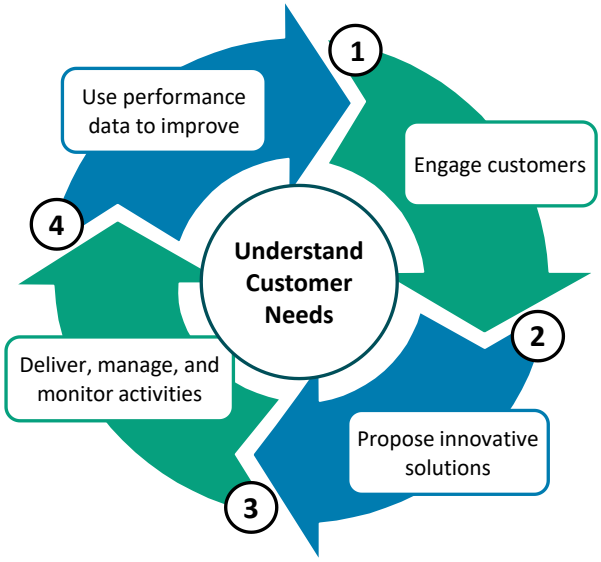
The Catalyst team will be responsible for the commercial, relationship, and performance management of the Catalyst. Partnership agreements will be developed and maintained with service providers, and the Catalyst team will work collaboratively with the service providers and advisory groups to identify, prioritise and scope the services through statements of work.

The service providers and advisory groups will collaborate with the Catalyst team on the continual evaluation and refinement of services through performance data and feedback. This process is detailed further in the Commercial Case.

**Figure 29: Catalyst service design process**

| | |
|---|---|
| 1 | Through collaboration and engagement with key industry participants, the Catalyst team will better understand the most important and unmet needs of its customers |
| 2 | The Catalyst management team will work collaboratively with Strategic Service Providers and partner agencies to design activities that provide innovate and long-term solutions to the needs of its customers |
| 3 | Delivery of Catalyst activities will involve continual management and monitoring to optimise achievement of outcomes |
| 4 | Performance data and impact assessment will give insight into what activities need to be adjusted, added, or removed from the Catalyst |

This process will be continual, meaning constant refinement of the Catalyst through ongoing feedback and impact assessment.



## 6.4 Catalyst Project Plan

*What are the key steps for moving this project forward and establishing the Catalyst?*

The project plan is structured across three phases: pre-establishment, establishment, and operations.

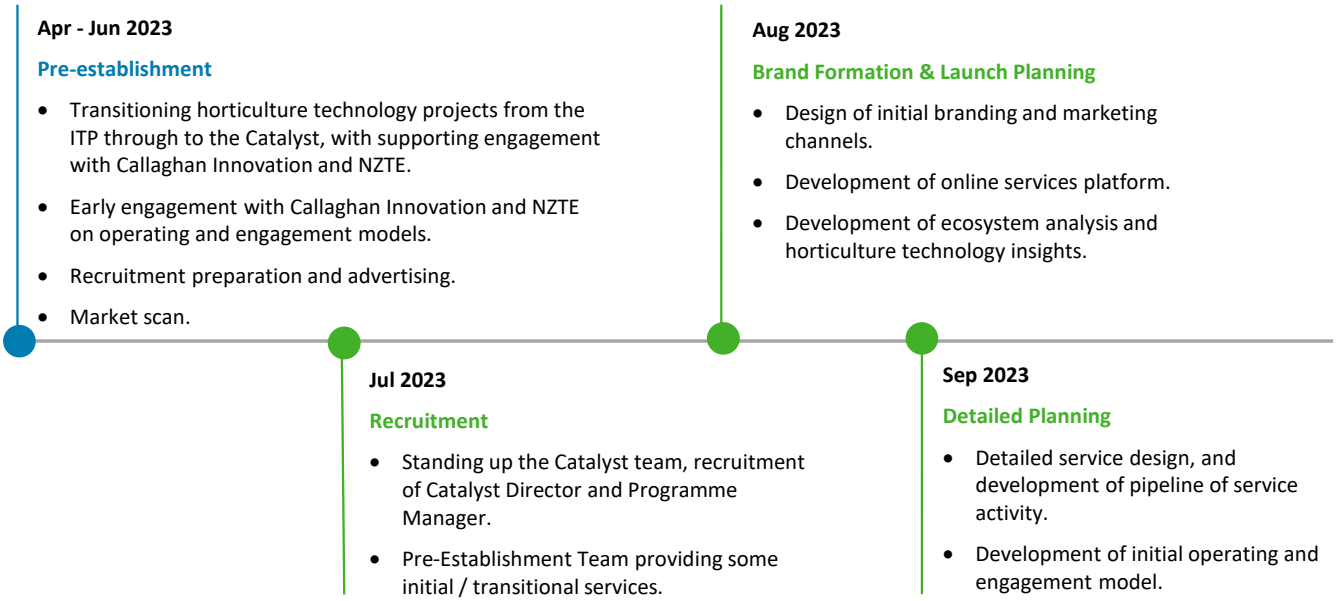
Pre-establishment follows endorsement of this Business Case and approval of funding, with full establishment and operation commencing in July 2023 with the receipt of funding. Detailed planning is anticipated to be complete by the end of 2023, with the Catalyst fully established as an entity by January 2024.

As described in the Commercial Case, initial / transitional services that can be delivered from "Day One" will be identified and agreed during pre-establishment.

The timelines presented are subject to Cabinet decisions and availability of funding. The high-level project plan including key milestones is shown in the following figures.

| | |
|---|---|
| **Pre-establishment** | The remainder of the current financial year, to 30 June 2023. Refer **Error! Reference source not found.**. |
| **Establishment** | The first six months of the Catalyst, to 31 December 2023. Refer **Error! Reference source not found.**. |
| **Operations** | The "steady state" period commencing 1 January 2024. Refer Figure 31. |

**Figure 30: Pre-establishment and Establishment Timeline**




## Pre-establishment

Current arrangements for the delivery of pilot services as part of the ITP will end on 30 June 2023. Following budget approval for the Catalyst, some of these pilots and services can be transitioned into the Catalyst, with supporting engagement with Callaghan Innovation and NZTE. This ensures there is no 'down-time', as pilots will continue to run while the Catalyst is in pre-establishment and establishment phases. Ongoing market scanning activity will begin, ensuring an up-to-date view of the ecosystem is known, in terms of key customers and available market services.

The Catalyst will have its own distinct operating model and customer experience. This requires alignment across service providers, so that Catalyst services operate together effectively. Work to continue to define and refine the operating model will continue with Callaghan Innovation and NZTE during pre-establishment, focused on understanding how to best leverage their existing operating and engagement models, and where changes are needed to provide consistency and the right experience for Catalyst services.

During this time, preparation for recruitment of the Catalyst team will be undertaken including draft role descriptions for the Catalyst team members and advertising for the Catalyst Director role. Consideration will be given to the scale of the Catalyst Director role, experience required, and the potential to fill this role on a temporary basis through an internal appointment or contractor resource.

## Establishment

From July 2023 the process to stand up the Catalyst team will commence, beginning with the appointment of the Catalyst Director, who will work with the EWG to appoint the Programme Manager and the remainder of the Catalyst team.

Development of the Catalyst brand and narrative, and communications plan will closely follow the recruitment stage, including development of the online service platform and digital tools.

To prepare for detailed service design and planning, ecosystem analysis and development of horticulture technology insights will be undertaken.

Through detailed planning, the service providers will be identified and the process of scoping the services will begin, resulting in a developed service activity pipeline.

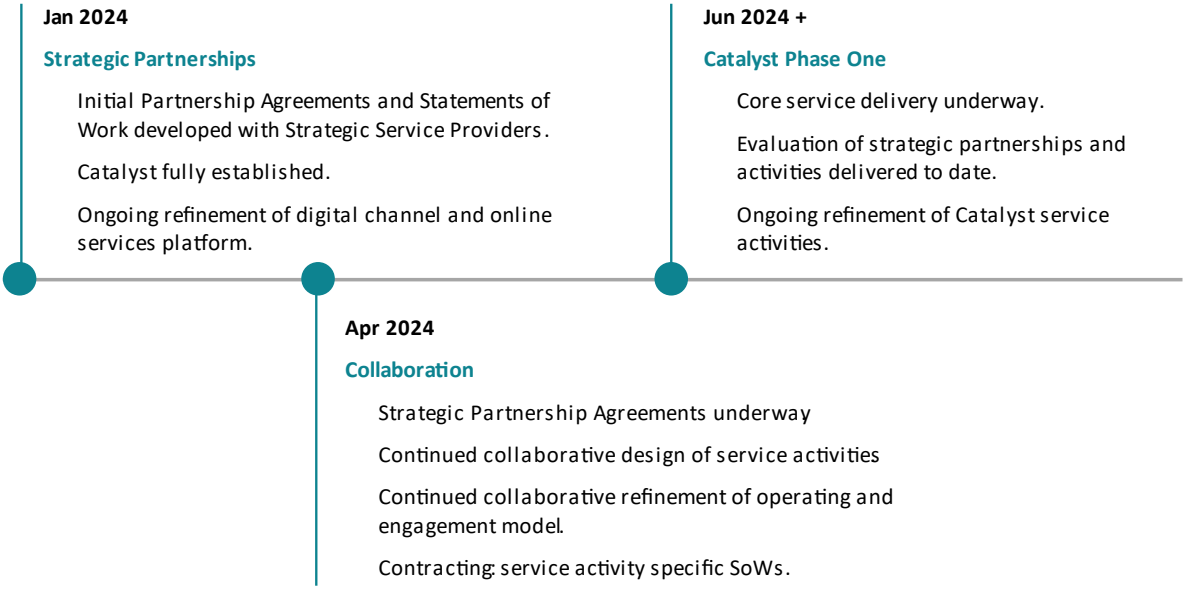
As discussed in the Commercial Case above, it is expected some service delivery will continue (following on from ITP pilots) during this transitional / initial period.

## Operations

The service pipeline developed through the detailed planning phase will shape the development of partnership agreements, and the first Statements of Work (SoW) for Catalyst activities, to be in place with the service providers by early 2024.

By the end of year one of operations, the portfolio of services will be initiated and in progress. As highlighted in the life cycle management, the strategic partnerships and service activities will continually be evaluated and refined throughout the life of the Catalyst, with ongoing refresh and maintenance of digital channel and tools.

**Figure 31: Operations Timeline**



## 6.5 Change Management

The impact of the Catalyst will bring change to the horticulture technology industry most effectively when the change is coherently managed between its stakeholders. The table below summarises the change impacts for MBIE – the Leadership and Management Team, the Catalyst Service Providers, and Catalyst customers.

**Table 32: Change impacts**

| Group | Description | Change Impact |
|---|---|---|
| **MBIE Catalyst Team** | This grouping comprises directly affected staff at MBIE, existing and new, involved in the pre-establishment, establishment, and operation of the Catalyst, as the as well as indirectly affected staff such as the Programme, Evidence & Insights team. | The key change for this group is the establishment of a new team within MBIE, to be included within MBIE's existing management structure.<br>Beginning with the Establishment Working Group, through recruitment/appointment of the Catalyst Director, Programme Manager and remainder of the Catalyst team, to establishment of partnership agreements and commencement of services, the size and focus of the Catalyst team will change. The Catalyst will draw on different parts of MBIE's business during these phases and will look to MBIE's Senior Management for enabling decision making. |

| Group | Description | Change Impact |
|---|---|---|
| **Customers** | This grouping comprises horticulture technology companies; those that are existing, future new companies, and existing companies that move into the horticulture technology space. | The key driver of change for this group is the change in services available and how to access them.<br>Horticulture technology companies currently engage with existing service providers for the support they require. The Catalyst will add new services to what is available.<br>The Catalyst launch will be important for communicating this change to customers and distinguishing the services of the Catalyst from those on offer elsewhere in the market. Development of a strong brand and communications plan with collaborative input from the service providers and advisory groups will be key to an effective launch.<br>MBIE will apply its internal processes for communicating changes to government services for businesses, and helping companies navigate to the right services, e.g. through the Regional Business Partner network and its online channels and information.<br>The EWG and Catalyst team will also leverage the ITP infrastructure and advisory groups to help ensure the change (and opportunity) for industry is communicated effectively. |

## Māori Engagement

Acknowledging the strong connection between Māori and their whenua, the Māori Economic Resilience Strategy recognises the Agritech ITP as an enabler of future economic prosperity, resilience and whānau wellbeing.

Engagement with iwi/Māori is a focus area of the refreshed Agritech ITP and, in October 2022, a dedicated ITP Māori Advisory Group was established, to work with the ITP to co-design initiatives under this focus area.

While the ITP's detailed approach to Māori engagement is still being developed, considerations around timeliness, inclusiveness and scope are front of mind and have already begun.

Initial thoughts on areas for further exploration for the ITP, and which could form a blueprint for Māori engagement include:

- Increasing opportunities for partnership between Māori agribusinesses and agritech businesses, and indigenous to-indigenous ventures
- Identifying future-focused Māori agribusinesses and collectives interested in utilising technology to building the knowledge base of Māori in the food and fibre sector
- Supporting Māori skills development through technology to encourage workforce opportunities and increase subject matter expertise across Māori trusts and agribusinesses
- Supporting the understanding and transfer of Māori agribusiness (including mātauranga Māori / Māori knowledge systems) across the sector
- Promoting Māori excellence in the Agritech sector.

Developing a robust work programme will require ongoing discussions with a range of Māori partners and stakeholders across the food and fibre sector. This acknowledges the varied and different roles and perspectives that Māori play in relation to agritech, and the ITP's intention to reflect and weave in Māori aspirations from these different roles. throughout the ITP's actions and outcomes.

In addition to being guided by the ITP and the Māori Advisory Group, the Catalyst is expected to engage in ways consistent with Te Arawhiti's *Crown Engagement with Māori* framework and other frameworks that appropriately support the engagement process.

The kaupapa of engagement will likely span Social, Environmental and Economic domains:

**Social** – understanding the needs of communities, particularly rangatahi, and how the Catalyst can develop pathways for education and employment.

**Economic** – understanding the aspirations of Māori horticulture technology companies and horticulture businesses, and how the Catalyst can amplify and contribute to realising those aspirations.

**Environmental** – understanding how the Catalyst can assist with furthering aspirations for environmental protection and enhancement of whenua.

The spectrum of the Catalyst's engagement will likely vary, depending on the partners and stakeholder/s being engaged, the topic discussed and the activity being undertaken. At this stage, it is anticipated engagement will range across Informing, Consulting and Collaborating, in accordance with the definitions described in the *Crown Engagement with Māori* framework.

## 6.6 Benefits Management

*How will we manage the benefits of the catalyst?*

### Benefits Management Model

The benefits described in the business case relate to how the Catalyst will deliver on the investment. From a benefits management perspective this means that all benefits of the investment will be considered at an eco-system view rather than a programme view. Benefits measures have been selected based on relevance to the investment objectives and outcomes within the Catalyst's scope, while recognising broader strategic influences on these (and in fact all) measures of its effectiveness.

### Benefits Realisation Plan

The benefits described in the Business Case relate to how the Catalyst will deliver on the investment objectives and ultimately on its purpose and strategic outcomes. Therefore, the benefits measures have been selected to maximise their relevance to the investment objectives and outcomes within the Catalyst's scope.

The benefit management map describes the anticipated benefits, the current baselines and how achievement will be measured and reported.

The Catalyst will manage benefits delivery in accordance with published Treasury guidance. The Programme Manager will:

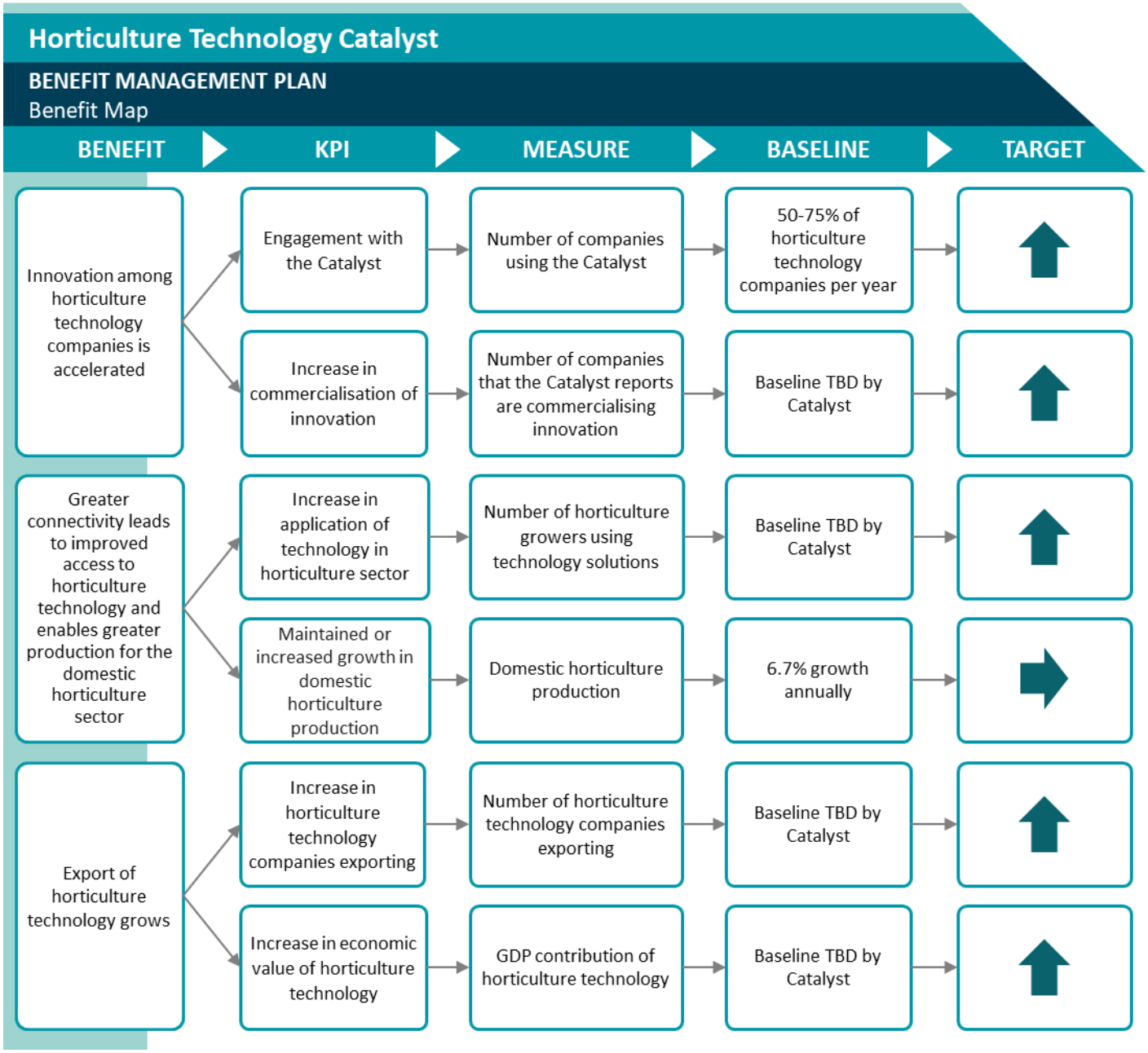
- Set up the benefits management and monitor delivery against these until the programme concludes.
- Maintain a Benefits Register which details the progress of achievement of benefits included in the business case.
- Report back to Cabinet within 12 months after the establishment date on the actual level of benefits achieved compared with those approved in the DBC and expected within that timeframe.
- Provide information to Treasury at agreed intervals on the actual level of benefits achieved compared with those identified in the DBC.

The Catalyst Director will:

- Be accountable overall for achievement of the benefits and performance against the Catalyst's intended benefits.
- Be supported by the Catalyst team to produce annual reporting to provide visibility of its achievement of the benefits and performance.

The benefit profiles provided in Appendix 7 details further how baselines and targets will be set, and the measuring and reporting of achievement.

**Figure 32: Benefits management map**



## 6.7 Risk Management

*Framework to support essential risk management through identifying, mitigating, and monitoring key risks*

Effective risk management is essential for the project's success, and MBIE's Programme team already has established processes and frameworks for risk management. Risk management will include a formal working session and review at least once every quarter.

**Figure 33: Risk management process**

## Key Risks

Table 33 summarises the key risks that have been identified for the Catalyst and their associated mitigations.

**Table 33: Key risks**

| Risk Area | Risk Description | Risk Mitigation |
|---|---|---|
| **Service coherence – service providers** | There is risk of duplication of services, lack of coherence, or competition between service providers.<br>For example, while Callaghan Innovation and NZTE have traditionally serviced different customer segments for the most part, there is now some overlap or blurring within the technology space, with NZTE often providing services to technology customers that are smaller / earlier stage than its traditional customers.<br>There are also many other organisations in the eco-system, and they too will continue to evolve the services they provide and customer segments they are targeting. | - By adopting a contracting model, the Catalyst will have line of sight across the market. This, along with the collaborative identification and prioritisation of services between the Catalyst team and service providers, enables the Catalyst to avoid duplication of services and competition between service providers.<br>- The Catalyst team (supported by advisory groups) will also be continually reviewing the eco-system of services available, and customer needs, to maintain a relevant and cohesive portfolio of services. |
| **Service change – service providers** | There is risk the Catalyst services are not well-integrated with service providers' existing operating and engagement models. | - Effective engagement with the service providers during pre-establishment and establishment phases to transition existing services and establish ways of working. |
| **Service coherence – customer experience** | There is a risk customers face confusion on which organisation (Callaghan Innovation, NZTE, MBIE, others) to get which services from and how to navigate the system. | - Effective engagement with the service providers during pre-establishment and establishment phases to develop a clear service offering and engagement model.<br>- Effective brand development, communications plan, Catalyst launch, and digital tools, so customers from across the spectrum are clear on the available services and how to access them. |
| **Lack of sustainable customer demand** | There is the risk of a lack of enthusiasm from the New Zealand market and limited utilisation of the Catalyst's free services. | - Strategic communications strategy.<br>- Continue to test developing services with industry groups. |
| **Lack of enduring government support** | The Horticulture Technology Catalyst will be publicly funded and require ongoing financial support from the government. There is the risk it will not receive adequate funding to enable a sustainable model. | - Through Budget 2023, seeking the first four years of establishment and operations funding, with operational costs funded from baseline thereafter. |

| Risk Area | Risk Description | Risk Mitigation |
|---|---|---|
| **Talent and recruitment risk** | There is risk that filling key roles for the Catalyst, such as the Catalyst Director and Programme Manager, will require long lead times in the current employment market. Appointment of these roles is a key dependency for the remainder of the establishment activities and long lead times could delay the launch of the Catalyst. | - Consideration will be given to the scale of the Catalyst Director role and the potential to fill this role internally, permanently or temporarily.<br>- A combination of fixed term contracts and permanent positions will be considered for shaping up the Catalyst team and mobilising quickly. |
| **Insufficient support or resource availability from identified partnership agencies** | To reach global markets and support investment initiatives, the Catalyst will need support from partnership agencies. If the agencies withdraw support or lower the priority of this initiative, it will be more difficult to develop international relationships. | - Maintain strong relationships with partnering agencies.<br>- Develop partnership agreements outlining expectations, responsibilities and roles, access to global networks and how the agencies will work together. |
| **Not achieving desired impact or scale of change within the industry** | There is the risk that lack of buy-in from stakeholders or demand from the industry will fail to transform the industry and will not deliver on key benefits. | - A targeted approach is being adopted, based on sector needs and growth potential, with ongoing collaboration with industry via the advisory groups to ensure services are aligned to need and demand. |
| **Joint-delivery** | There is the risk a party could pull support from the initiative, if priorities shift or one party assumes more of the risk beyond its tolerance threshold. | - The strategic partnership approach, including regular relationship management and evaluation, and ability to flex through individual SoWs provides the Catalyst with line of sight across providers and agility. |

## 6.8 Quality Management

This initiative has been assessed as low risk through the Risk Profile Assessment process. As such, there are no formal Gateway reviews or similar requirements.

MBIE's organisational infrastructure, including practices and resources from the Programme, Evidence & Insights team will be leveraged to provide Quality Management for the Catalyst. The Programme Manager, with the support of the Catalyst and Programme, Evidence & Insights teams, will establish a quality management plan.

The Catalyst delivery approach includes a range of quality management features summarised in the table below.

**Table 34: Quality management features**

| Key Quality Management Features | |
|---|---|
| **Catalyst** | Performance of the Catalyst against its objectives will be reported quarterly through MBIE's organisational senior management. |
| **Catalyst Service Pillars** | The operationalisation of the three service pillars (Industry Connector, Industry Talent Development, Project Facilitation) will be assessed quarterly, reported to the ITP Steering Group. |
| **Catalyst Strategic Partnerships** | The performance of the Strategic Service Providers will be evaluated as per the Partnership Agreements. |
| **Catalyst Activities (individual SoWs with Service Providers)** | Individual Catalyst activities will be assessed through their SoWs. Performance data and feedback will be used in an evaluation process to determine what activities need to be adjusted, added, or removed from the Catalyst. |

# Appendices

# Appendix 1 Governance, Reference and Advisory Groups

Over the course of this project there has been a range of groups supporting the development of the business cases, and overseeing the design of the Catalyst and its alignment with wider agritech initiatives.

## Industry Reference Group (IRG)

A group of industry leaders that have been engaged to test the direction of the Horticulture Technology Catalyst. Key aspects that have been tested across this group are:

- Activities and services that will add value to researchers, growers, and technology companies, as well as wider benefits the Catalyst would deliver
- Commercial and operating model
- Existing initiatives in the marketplace and how these will align and feed in alongside this
- Governance model
- Agreement on the vision for this initiative

Role:

- Input into workshops
- Reference point as validation work is worked through
- Being a part of creating the vision for the future of horticultural technology for New Zealand

The tables below list the members of the various groups involved during the development of the DBC and IBC, and those involved in advisory going forward.

**Table 35: IBC Industry Reference Group**

| Industry Reference Group for IBC (July – October 2020) | |
|---|---|
| **Simon Yarrow** | Callaghan Innovation |
| **Peter Barrowclough*** | Lincoln Agritech |
| **Geoff Furniss*** | TOMRA / BBC Technologies |
| **Steve Saunders*** | Robotics Plus |
| **David Downs** | MBIE |
| **Mike Duke*** | University of Waikato |
| **Roger Robson-Williams** | Plant & Food Research |
| **Juliet Ansell*** | Zespri |
| **Gary Wellwood** | T&G Global |
| **Helen Barnes / Karen Orr** | Horticulture NZ |
| **Nicky Molloy** | Callaghan Innovation |
| **Natasha Telles D'Costa** | MPI |
| **Lance Dear** | Deartech |

*Strategic Assessment interviewee

**Table 36: Establishment Project Steering Group**

| Horticulture Technology Catalyst Establishment Project Steering Group (February 2021 – June 2022) | |
|---|---|
| **Steve Saunders*** | Robotics Plus |
| **Dean Tilyard*** | Sprout |
| **Geoff Furniss*** | TOMRA Food |
| **Peter Barrowclough*** | Lincoln Agritech |
| **Simon Yarrow** | Callaghan Innovation |
| **Francene Wineti** | Independent Director |
| **Brendan O'Connell** | AgriTechNZ |
| **David Downs** (until August 21) | MBIE |

*Strategic Assessment interviewee

**Table 37: DBC Industry Reference Group**

| Industry Reference Group for DBC (November 2022 – Present) | |
|---|---|
| **Simon Yarrow** | Callaghan Innovation |
| **Peter Barrowclough*** | Lincoln Agritech |
| **Geoff Furniss*** | Edison Darby |
| **Steve Saunders*** | Robotics Plus |
| **Brendan O'Connell** | AgriTechNZ |
| **Kylie Horomia** | AgriTechNZ, Chair of ITP Māori Advisory Group |
| **Duncan Catanach** | NZTE |
| **Paul Johnstone** | Plant & Food Research |
| **Dean Tilyard*** | Finistere Investments |
| **Mark Begbie*** | (Formerly) PlantTech |

*Strategic Assessment interviewee

**Table 38: Agritech ITP Steering Group**

| Agritech ITP Steering Group (Present) | |
|---|---|
| **Kylie Horomia** | AgriTechNZ, Chair of ITP Māori Advisory Group |
| **Bridgit Hawkins** | CropX Technologies |
| **Lisbeth Jacobs** | Gallagher Group |
| **Steve Saunders*** | Robotics Plus |
| **Dean Tilyard** | Finistere Ventures |
| **Juliet Ansell*** | Zespri International |
| **Dan Taylor** | NZTE |
| **Craig Bunt** | University of Otago |
| **Mark Ennis** | Farm Source |
| **Clare Bradley** | AgriSea New Zealand |
| **Dean Ford** | MBIE |
| **Simon Yarrow** | Callaghan Innovation |
| **Brendon O'Connell** | AgriTechNZ |

*Strategic Assessment interviewee

**Table 39: Agritech ITP Māori Advisory Group**

| Māori Advisory Group (Established August 2022) | |
|---|---|
| **Kylie Horomia** | AgriTechNZ (Chair) |
| **Tasman Gillies** | Te Rūnanga o Ngāi Tahu |
| **Paki Nikora** | Tataiwhetu Trust |
| **Richard Laverty** | Te Puni Kōkiri |
| **Tina Ngatai** | Onuku Māori Land Trust |
| **Anaru Timutimu** | Māori Kiwifruit Growers Incorporated |
| **Guy Royal** | Tuia Group |
| **Vonese Walker** | Poutama Trust |

# Appendix 2 Long-list Options Summary

The investment objectives, used as part of the long-list assessment, are outlined in the Strategic Case.

The Economic Case explores the potential of the Horticulture Technology Catalyst, what it offers the industry and how it would benefit key stakeholder groups. It sets out the process undertaken to arrive at the Preferred Option – stepping through evaluating the short-list of options.

In reaching this short-list, five **Critical Success Factors** were chosen to evaluate a long-list of options, which were developed using a **Dimension Framework**. The options were scrutinised using these **Critical Success Factors** and the investment objectives discussed in the Strategic Case, ultimately refining down the list to the short-list of three options

## Critical Success Factors

1. Strong likely customer base for services

   *The ability of an option to attract and retain stakeholders and customers, and build an enduring local and international customer and partner base.*

2. Strategic fit with horticulture technology and meeting industry needs

   *The ability of the option to meet the needs of the industry stakeholders: innovators/companies, research institutes, grower bodies, horticulture companies, tertiary institutions, and relevant government agencies.*

3. Potential long-term sustainability and value for money

   *The ability of the option to achieve long-term success and continually provide value on investment received.*

4. Affordability

   *The likelihood of the option to gain access to public funding for establishment and ongoing costs, both capital and operating expenditure, to meet the assumed scale of cost.*

5. Potential achievability

   *The ability of the option to acquire and build the necessary capability and capacity to deliver the services (industry insights, business investment and commercial support services, project management for a niche interest area, draw investors and buyers).*

## Dimension Framework

A range of possible options for the Catalyst were considered. Table 40 summarises the dimensions used to demonstrate choices available when defining the long-list.

**Table 40: Dimension framework**

| | |
|---|---|
| **Scope of Service** | What are the type of services the Catalyst could offer? |
| **Scope of Technology** | What type of technology should the Catalyst focus on? |
| **Sector Focus** | Should the Catalyst have a narrow or broad sector focus? |
| **Service Delivery** | Should the Catalyst be fully virtual, a single physical location, split across regions or a mix? |
| **Governance** | What is the preferred mix of governance between government and industry representation? |
| **Building** | What type of building should be used for the Catalyst? |

# Appendix 3 Long List Options

The purpose of the Catalyst was established in the Strategic Assessment. The remaining key choice revolves around the scope of services it could offer and activities it could perform. It is vital the final proposed list of services addresses a market gap and are sustainable over the long term, both from an operational and funding perspective.

Below is a snapshot of the options that were defined in the IBC. Options A, B and C have been updated in the short list evaluation.

**Status Quo**

There is a small range of pilot programmes being undertaken by the Catalyst Establishment team. However, industry transformation will be difficult to achieve given the lack of scale of the pilots and the nascent stage of the Catalyst. In a world with growing populations and shifting consumer preferences, living standards, urbanisation rates and increasing pressures from labour shortages, horticulture technologies have the ability to assist growers and significantly increase production. New Zealand companies have the right technology, but the system requires some serious structural changes to assist them achieve scale. A Status Quo scenario would represent a missed opportunity for New Zealand to grow a strategic high value-add export sector.

**Option A: Catalyst Light – Industry Connector**

Industry connector services are offered by a light-touch Catalyst – essentially a do minimum option. Initiatives will better connect existing government services and play a facilitating role between early-stage technology companies, funding providers, and domestic and international commercialisation partners. The Catalyst will have a 'central' hub, but will have people present in key growing regions, sharing facilities and working alongside technology companies.

**Option B: Catalyst – Targeted Services**

The Catalyst will deliver more expanded services than the minimum. It is more than a facilitator – it will deliver a range of services across commercialisation support, talent development, and industry alignment. Sector focus is horticulture only, and will have a broad technology focus. Like the Catalyst Light, it will have a central hub and regional nodes, and will look to lease premises or share space with existing institutions or businesses.

**Option C: Catalyst Plus**

This option delivers the widest range of services to horticulture technology companies – far more enhanced and fulsome than the Catalyst – targeted services. In this option, the Catalyst would also be directly involved in commercialisation activities, and hold intellectual property, as well as house an education academy. In addition to entering leasehold arrangements with current like-minded companies and organisations in key growing technology regions, the Catalyst would also develop a purpose-built facility, which would act as the central hub.

**Option D: Broad Tech and Sector Focus**

Similar to Option C, but with a broader reach: This option lifts its gaze above horticulture and looks to the wider agriculture industry, and expands its technology focus by including genetics and other aspects of biology.

The expanded nature of technology and sector focus would require a similar, but larger, service delivery and building approach to Option C, with more regional nodes in order to expand to regions strong in aspects of agriculture beyond growing.

**Option E: Catalyst for Primary Sector**

This option would offer targeted support services for technology companies across the full primary sector, on land and at sea. It would operate across the country and, because of the range of regions in both the North and South Islands it would be of relevance to, there would be no 'central location'. Instead, existing facilities would be used, partnering or leasing where it makes sense to.

**Option F: Catalyst – Bold Play**

An agricultural technology behemoth springs from this option, with the creation of a single significant location, similar to the Gracefield Innovation Quarter. It will gather in one vast central location all the talent in agritech, and

provide state of the art, purpose-built facilities, which will serve a showcase for international visitors, investors, and partners.

With critical mass at one location, there will be limited outreach to the regions, and the Catalyst will be fully governed by the public sector.

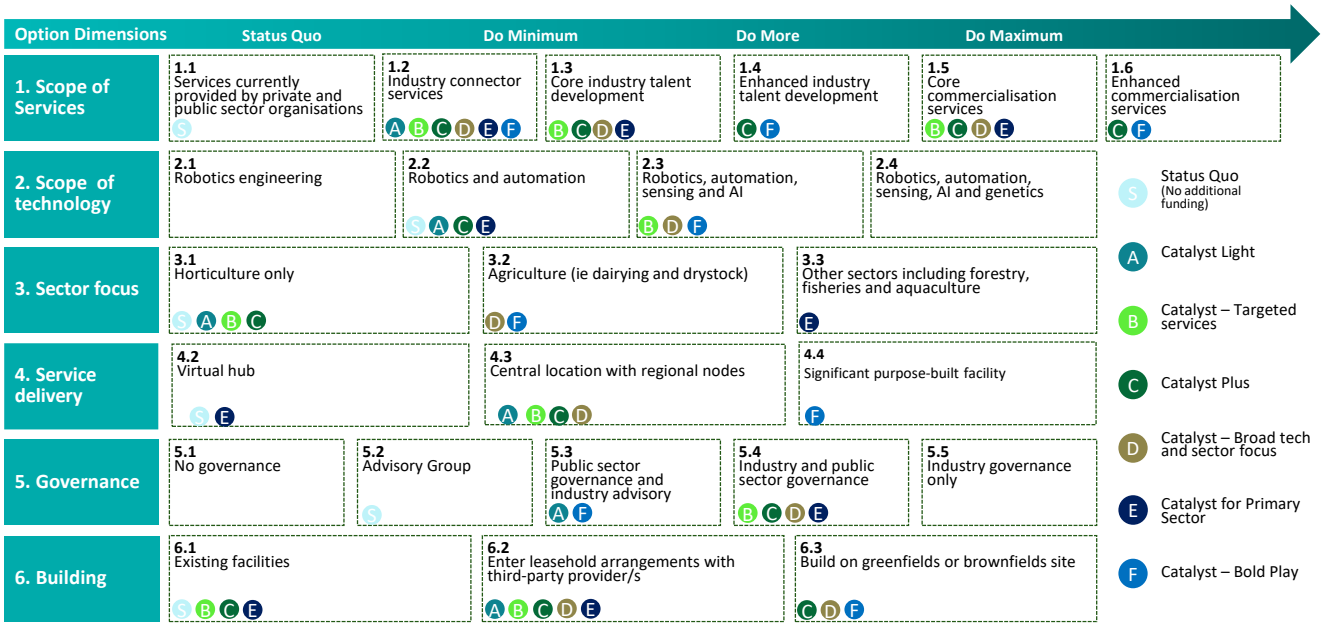
## Development of long-list framework

Within each dimension, there is a spectrum of choice, reflecting the status quo scenario, with smaller intervention choices building out to more larger change choices. Options are developed by selecting individual but complementary choices for each dimension. Some choices are not considered for any option as they were assessed as unrealistic to apply to this project.

No option takes a narrow approach to the technology focus, as there was a clear view the focus needed to be sufficiently broad to incorporate a range of technologies.

As the Catalyst would need both the buy-in of, and collaboration between, the private and public sectors, industry governance only was not considered viable.

**Figure 34: Long-list framework**



# Appendix 4 Long-list Options Assessment

## Approach

Table 41 summarises the long-list options assessment against the investment objectives and Critical Success Factors. The assessment uses a five-point measure to judge each option's ability to achieve the criterion, ranging from 'Does not meet' at the low end through 'Partially Meets', 'Somewhat Meets', 'Meets' and 'Strongly Meets' at the high end of the scale. 'Fails' means an option element does meet the criterion.

**Table 41: Long-list options evaluation**

| **Long-list Options** | **Status Quo** | **Option A** Catalyst Light: Industry Connector | **Option B** Catalyst: Targeted Services | **Option C** Catalyst Plus | **Option D** Catalyst: Broad Technology and Sector Focus | **Option E** Catalyst for Primary Sector | **Option F** Catalyst: Bold play |
|---|---|---|---|---|---|---|---|
| **Investment Objectives** | | | | | | | |
| Positioning New Zealand as a world leader in horticulture technology | Does Not Meet | Somewhat Meets | Strongly Meets | Somewhat Meets | Meets | Somewhat Meets | Strongly Meets |
| Enabling commercial partnership, resulting in the commercialisation of IP | Does Not Meet | Partially Meets | Strongly Meets | Strongly Meets | Strongly Meets | Meets | Strongly Meets |
| Providing the interface between market participants and enhancing collaboration | Somewhat Meets | Strongly Meets | Strongly Meets | Strongly Meets | Strongly Meets | Meets | Somewhat Meets |
| Delivering on the vision of the Agritech ITP | Partially Meets | Somewhat Meets | Strongly Meets | Strongly Meets | Somewhat Meets | Somewhat Meets | Partially Meets |
| **Critical Success Factors** | | | | | | | |
| Strong likely customer base for services | Meets | Meets | Meets | Meets | Meets | Meets | Meets |
| Strategic fit with hort tech and meeting industry needs | Fails | Meets | Meets | Meets | Meets | Fails | Fails |
| Potential long-term sustainability and value for money | Fails | Meets | Meets | Meets | Fails | Fails | Fails |
| Potential affordability | Meets | Meets | Meets | Meets | Fails | Meets | Fails |
| Potential achievability | Meets | Meets | Meets | Meets | Fails | Meets | Fails |
| **Conclusion** | | | | | | | |
| | **Discounted** | **Possible** | **Preferred** | **Possible** | **Discounted** | **Discounted** | **Discounted** |

## Outcomes of long-list assessment

Options A, B, and C are taken forward as short-list options. The Status Quo is taken forward as a comparator for the short-listed options. Under the Status Quo, limited pilot activities and establishment are taking place. There is light-touch advisory oversight, but the time-limited funding means establishing the Catalyst in earnest cannot commence. There is no scale of activities, nor ability to do so, which drive uncertainty in the sector. Funding ceases in June 2022 and, with that, the nascent Catalyst.

The contribution horticulture technology companies make to the economy without the Catalyst will likely grow incrementally, but there will be no 'surge' or boost in the number of exporting organisations.

**Figure 35: Long-list discounting outcomes**

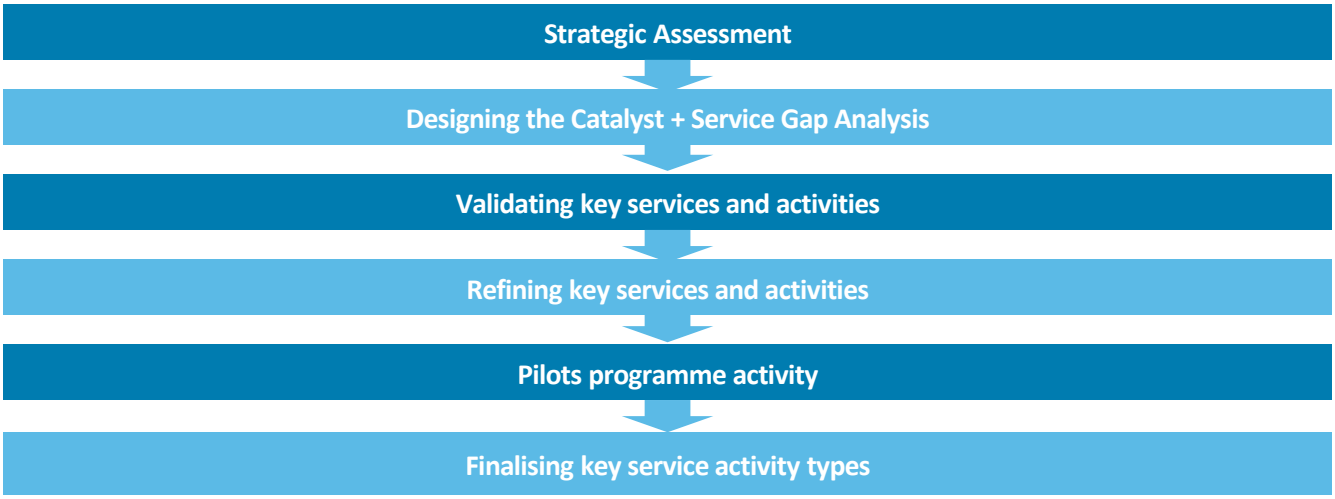
# Appendix 5 Service Validation Journey: From gap analysis, to service design and piloting programmes

## The Service Validation Process

For the Catalyst to be a high-impact project, it must deliver in the space where it is most needed. This process helped to identify, refine and validate the Catalyst service offerings and activity types, from a broad list of possibilities, down to a refined set of priority high-value offerings.

Throughout this process, key stakeholders were engaged to ensure the Catalyst continued to represent sector needs and refine the potential services of the Catalyst.

**Figure 36: Service Validation Process Overview**




The following pages step through the continual gap analysis and service validation process undertaken by the Catalyst team since 2020, and up until the present day. As the Catalyst progressed, the purpose, structure and services offerings were iterated by the Catalyst team and with the input of interviewees and Industry Reference Group members.

### Gap Analysis

A gap analysis was undertaken during the development of the indicative business case, to understand the range of existing service providers in the New Zealand market and the focus of these services. This information was then used to validate the readily available services and which therefore should not be duplicated by the Catalyst, and where the major gaps were, particularly in relation to service offerings targeting horticulture technology providers.

The following organisations or sectors are examples of service providers:

**Universities**

- Multiple universities in New Zealand offer short, industry-focused courses on core management and commercialisation skills. This includes the University of Waikato, the University of Auckland, Victoria University of Wellington, the University of Otago, and the University of Canterbury. Numerous horticulture and agriculture qualifications are offered in New Zealand; however, there are limited internships and workforce placements available, and students have limited visibility of what might be available to them. The Catalyst can help bridge the gap between education and workforce by helping organisations to facilitate internships or placement opportunities, and provide a platform to connect those seeking experience and those offering it.

**Researchers – CRIs, independent research institutions and universities**

- Both Plant & Food Research and Landcare Research are examples of New Zealand CRIs investing heavily in agricultural and horticultural science. CRIs, indepednent research institutions, and university-led commercialising hubs, represent some of the technology talent pool in New Zealand and, while the current innovation network in New Zealand is an excellent base, it lacks consolidation of efforts for targeting key areas of scientific knowledge required for advancing commercial outputs. The Catalyst will provide clear pathways to access industry insights and information, and help build connections and relationships between researchers and technology companies, solidifying what is currently considered a fragmented network.

**Government agencies and industry bodies**

- Many government bodies, regional economic development agencies and industry bodies advocate for horticulture technology and agritech more broadly. However, there does not appear to be a body responsible for coordinating research in this area, nor is there a standardised reporting system for data.
- There are organisations such as AgriTechNZ which is a purpose driven, membership-funded organisation connecting innovators, investors, regulators, and researchers to advance the development of agritech and on-farm uptake in New Zealand; and Callaghan Innovation, which offers research and development services, and funding and training initiatives to help businesses grow faster. The gap analysis has helped to ensure the Catalyst does not duplicate these service offerings but instead seeks to connect these services, directing customers to relevant providers, and provide services that are complimentary to those that exist in order to fill service and support gaps identified by stakeholders.

**Incubators and accelerators**

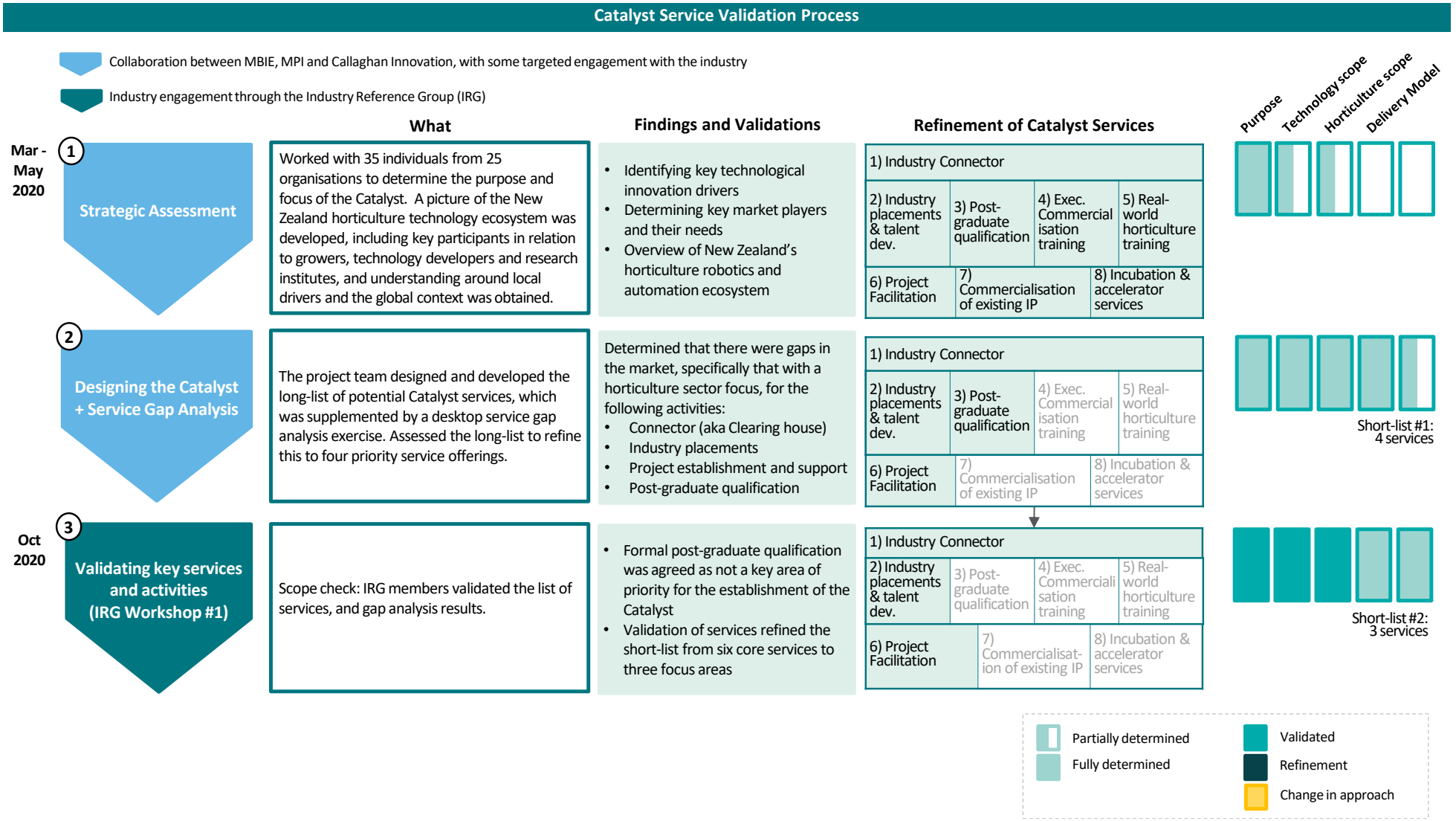
- Numerous incubation and accelerator programmes exist in New Zealand. These programmes are mostly funded by a mix of government grants and corporate sponsorships. Reputable incubators and accelerators include Icehouse (Auckland), Soda Inc. (Hamilton), and the Factory (Palmerston North). Other programmes are offered through regional councils and economic development agencies, including agencies in Whangarei, Auckland, Hamilton, Rotorua, Wellington, Queenstown, Christchurch and Auckland.
- Callaghan-funded founder incubator programmes and accelerator programmes are also offered. Sprout Agritech Accelerator, owned by The Factory, is the well-known agritech-specific accelerator operating in the New Zealand market. Therefore, the Catalyst will not seek to deliver this service, nor undercut existing providers, but instead have up-to-date knowledge of the ecosystem of service offerings and direct customers to the right pathways.

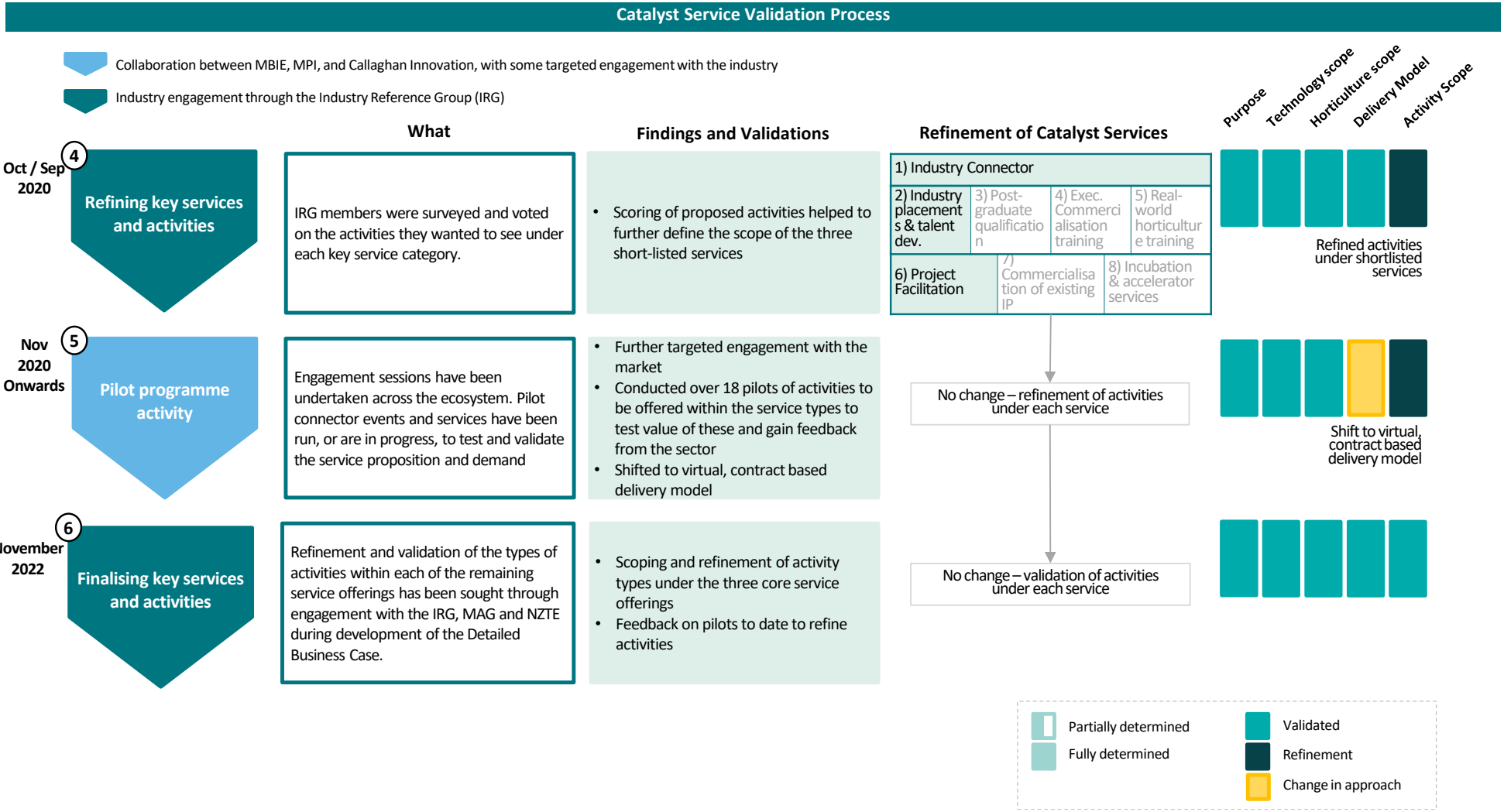
**Targeted service and activity providers**

- There are broader organisations with relevant initiatives whom the Catalyst can link in with, enabling the market to access targeted services, particularly in relation to Maori leadership programmes and talent development initiatives.
- For example, Te Ara Pōtiki is a Māori-founded national internship programme, with a focus on the agritech sector, and is in the process of seeking funding support from MBIE to establish the *Te Ara Pōtiki Trust*. The program seeks to place Māori into high-tech start-ups in the USA, New Zealand and other potential locations. The high-tech businesses Māori interns will be placed into are companies in Finistere Venture's portfolio, which includes those with a horticulture focus like Plenty (an indoor vertical farm). Plant & Food Research also hosts Māori students through its summer studentship programmes, increasing Māori involvement in the industry. The Catalyst will look to leverage existing and future partnerships, and help provide the pathway into such high-value programmes and create awareness of these opportunities.

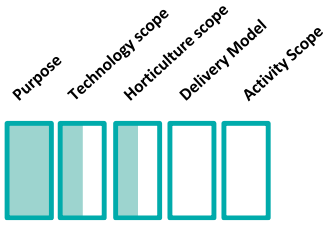
The summary below outlines the development of the Catalyst's service offerings.

**Figure 37: Detailed Service Validation process**





# Step 1: Strategic Assessment




## What did this step seek to achieve?

A strategic assessment was undertaken which included developing a view of New Zealand's horticulture technology ecosystem, understanding the key participants and their needs, and existing activity within the sector, as well as consideration of relevant international models with a similar service-based focus. This in turn provided a view of the key drivers of establishing a Catalyst, and helped shape what its core purpose would be.

## What was the process undertaken?

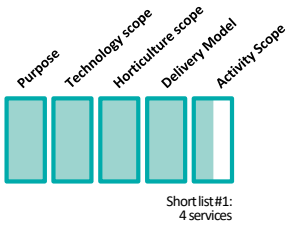
Industry research was conducted to determine key innovation drivers and existing market players. A number of participants and stakeholders involved in New Zealand's horticulture technology sector were interviewed to better understand the needs within the ecosystem.

## What were the key findings and validations?

The Strategic Assessment also:

- Gained an overview of New Zealand's horticulture technology ecosystem
- Conducted research which highlighted specific need in a targeted focus of the horticulture sector and identified key technological innovation drivers
- Research also identified a range of institutes overseas with a similar service-based focus, which use a mix of virtual and physical sites for agritech development

# Step 2: Designing the Catalyst + Service Gap Analysis




## What did this step seek to achieve?

This step sought to scope and design the Catalyst, including the potential services it could offer. The initial set of service offerings were refined by the working group, based on the known needs of the industry (drawing on the Strategic Assessment) and through a desktop market services gap analysis exercise.

## What was the process undertaken?

- The design of the Catalyst was progressed, as the technology and sector focuses were agreed, and the delivery model was developed through consideration of different options which were captured in the indicative business case. The delivery model at this stage was assumed to be a new team within Callaghan Innovation, made up of new FTEs, with some regional presence as team members would lease offices in regions horticulture technology. The delivery model was subsequently changed and refined in step five of this process.
- The list of eight services were developed, and assessed through a scoring process with the Catalyst project team.

## What were the key findings and validations?

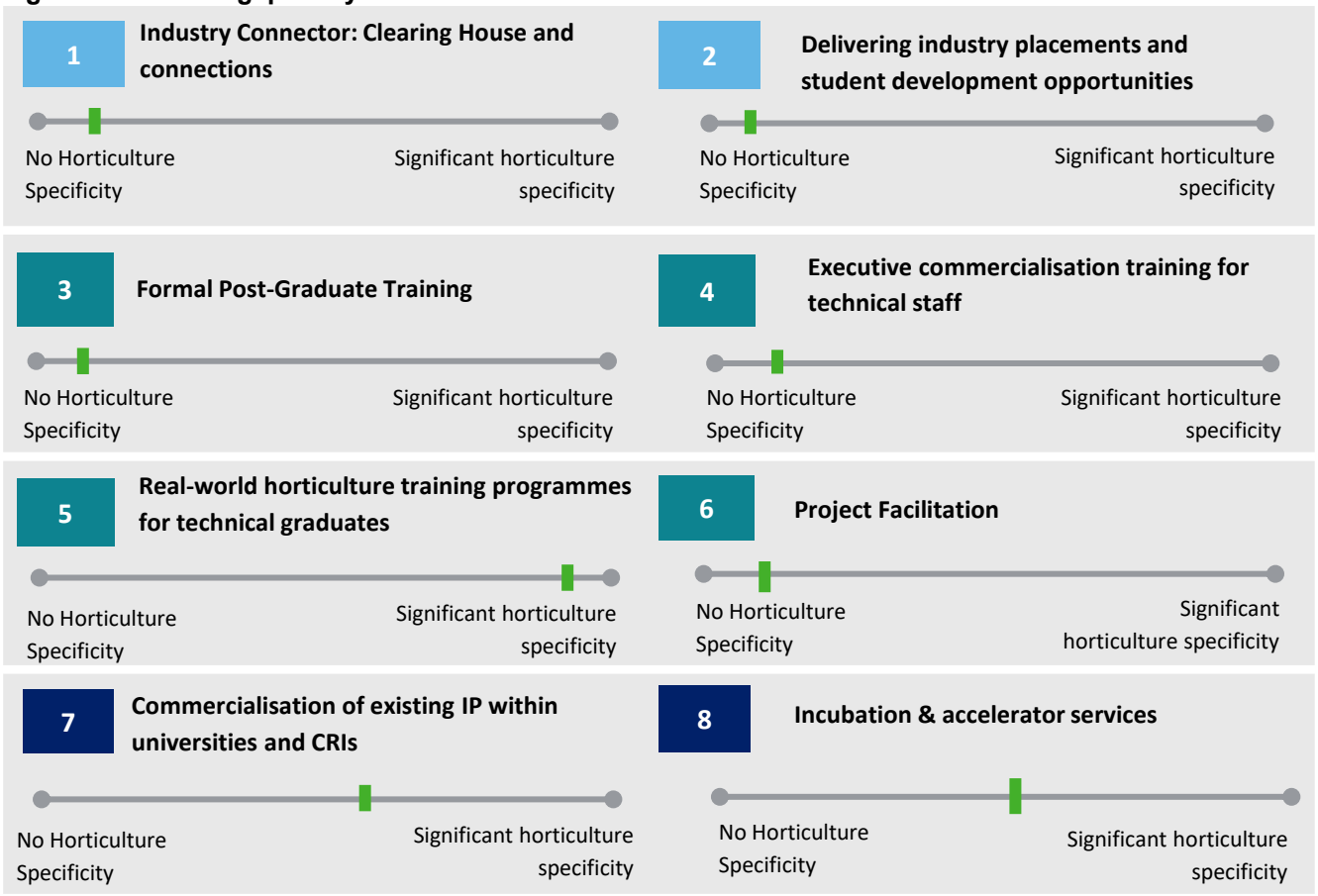
- The Catalyst will take a robotics and automation technologies focus
- The Catalyst will focus on the horticulture sector
- The long-list of 8 service offerings was developed, refined, and cut down
- Optioneering of the delivery model was undertaken

The findings from the service gap analysis assisted in shortening the list of services down to four potential services. Executive commercialisation training and Incubator accelerator services were removed from the list of services. Some of the findings are outlined below:

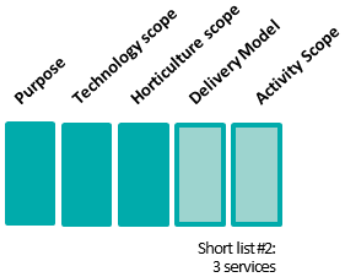
- New Zealand universities often require a minimum level of practical work experience in order to fulfil the requirements for undergraduate and post-graduate degrees. However, in most cases the onus is on the student to organise industry placements.
- Some smaller institutes, particularly in the ICT field, may organise paid industry placements, however, these are not agritech or horticulture technology related. KiwiNet also manages a commercialisation internship scheme.
- There are no existing examples of commercialisation vehicles in New Zealand with the same structure and purpose. This would represent a significant change in intent and structure of the market offering.
- There are networks to connect existing researchers, but these are not horticulture related, nor is there evidence they collaborate significantly with industry members.

Services four and five in the following diagram were not taken forward, as while there might be some gaps in the market in relation to these services when it comes to offerings specifically targeting the horticulture sector, these were not of highest priority of value in addressing the core needs of the industry, as understood through the Strategic Assessment. This was then validated by the IRG in the following step.

**Figure 38: Service gap analysis results**



# Step 3: Validating Key Services and Activity Types

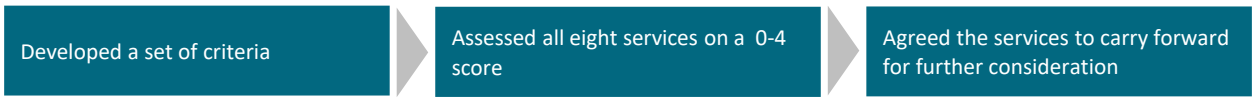



## What did this step seek to achieve?

This step sought to validate the long-list of services, as well as the results of the desktop market gap analysis.

## What was the process undertaken?

The proposed short-list services were validated with the IRG. During a workshop, members scored the services based on a set of criteria to illustrate which services were a priority to them.

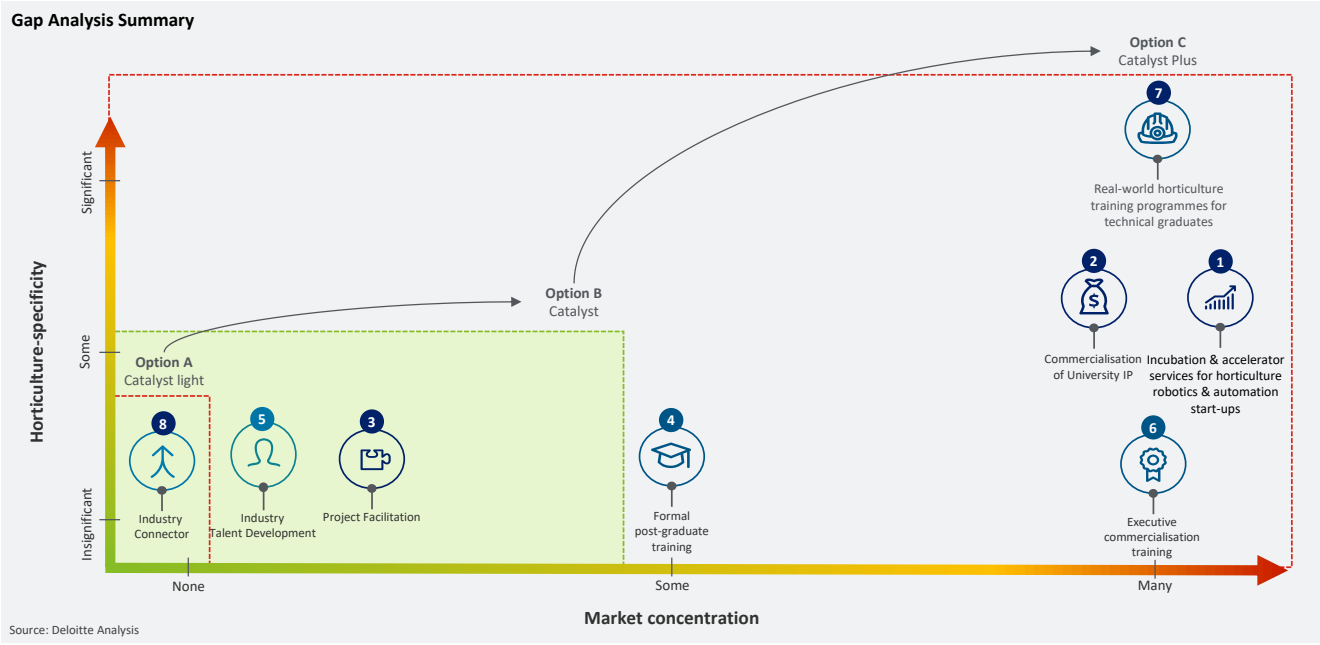



The service offerings were placed on a spectrum of services, with each option adding more individual services. This helped to identify options to consider within the indicative business case and support the long-list to short-list evaluation.

## What were the key findings and validations?

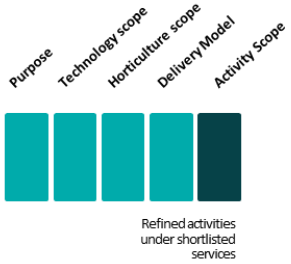
- Option C, while including the full suite of services, will include a number of services already offered in the market with a certain degree of horticulture specificity.
- Formal post-graduate qualification was agreed as not being a priority for the establishment of the Catalyst
- Option B endorsed as the 'sweet' spot for the Preferred Option

**Figure 39: Preferred option validation**




This process helped to refine and validate the scope of services to the three key focus areas within Option B, the Preferred Option.

# Step 4: Refining Key Services and Activity Types




## What did this step seek to achieve?

This step provided another layer of detail, as it considered the types of activities that could be offered for each of the three services under the Preferred Option. It sought to determine the types of activities considered a priority across the ecosystem, with respect to research organisations, technology companies and growers.

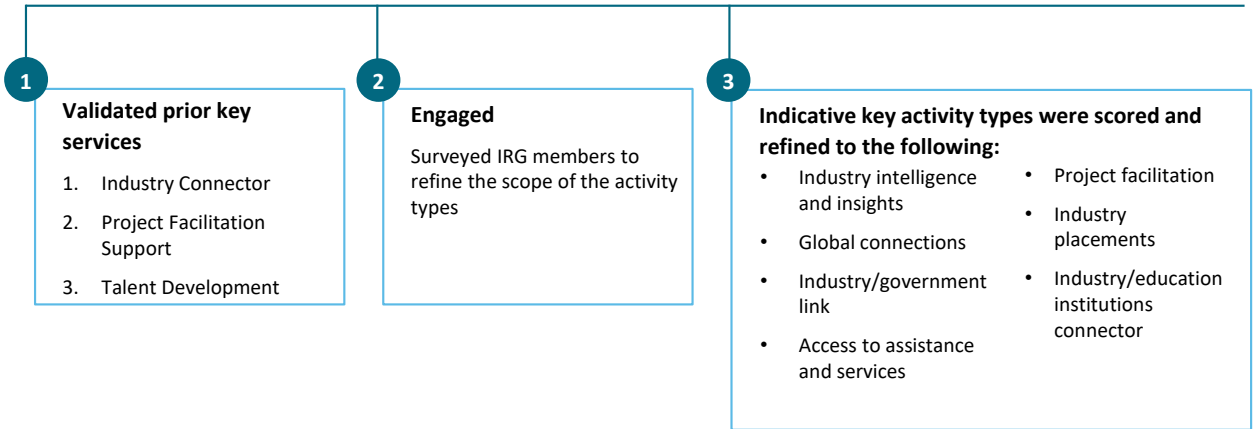
## What was the process undertaken?

IRG members were surveyed and asked to vote on the activities they wanted to see under each key service category. Voting was conducted through a scoring process.

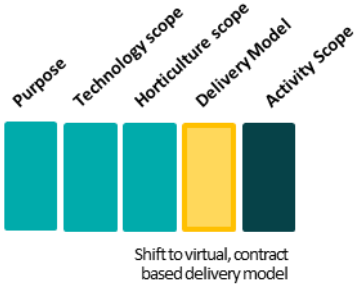
## What were the key findings and validations?

- Highlighted the activities considered of priority across research companies, technology companies and growers
- Scoring of proposed activities helped to further refine the scope of the three agreed services
- While the Catalyst will not directly offer formal qualifications, it will support hands-on, real-world training and talent development for students, bridging the gap between theory and practice, in intense commercial environments.

**Figure 40: Steps in refining key services and activities**



# Step 5: Pilot Programme Activity




## What did this step seek to achieve?

Engagement sessions and pilot events and activities were undertaken to test the validity, need and demand for a subset of the service proposition. The delivery model was also discussed further between the strategic partners and with IRG members, in order to ensure the model, which is proposed in the detailed business case, is one that will be successful and provide a cost-effective approach to operating the Catalyst.

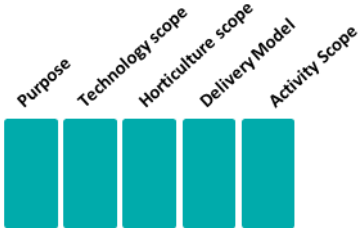
## What were the key findings and validations?

- The pilots are broad examples of the types of activity the Catalyst may deliver
- Events and activities were highly rated by participants
- Through discussions with the industry, and with consideration of affordability, it was determined the delivery model could be delivered successfully through a virtual model. This decision was validated with the IRG.

**Table 42: Pilots**

| | |
|---|---|
| **Industry Connector** | |
| **Inwards Missions** | US Agritech Discovery Tour / Discovery Day<br>Walt Dufolk, Western Growers (Aug and Nov 2022)<br>Australia WineTech (27-29 June 2022) |
| **Targeted Industry Events** | Agritech in the Orchards (24 August 2022) |
| **Broad, Mixed Sector Industry Events** | Offshore Events (evokeAG, FIRA and Forbes AgTech)<br>NZ Industry Events – Fieldays (30 Nov – 3 Dec 2022) |
| **Industry Intelligence and Insight Reports** | Global Signals |
| **Technology Applications Showcase** | Early Adopter Network<br>Agritech in the Vineyards |
| **Communications & Community Building** | Agritech Knowledge Hub |
| **Industry Talent Development** | |
| **Capability Programmes** | Scale for Global Growth |
| **Project Facilitation** | |
| **Horticulture Technology Specific Webinars & Workshops** | CCA & Remote Sensing Regulation Workshops<br>Industrial Hemp & Medicinal Cannabis |
| **Technology and Product Commercialisation Advice** | Global Insights |
| **Funding and Investment Access Support** | Agritech Support Explorer |

# Step 6: Finalising Key Services and Activity Types




## What did this step seek to achieve?

This step sought to finalise activity types through discussion on the level of impact and success from the pilots offered to date, how the proposed activity types help solve problems identified in the Strategic Case, and which activity types are priorities for the industry, as represented by IRG members.

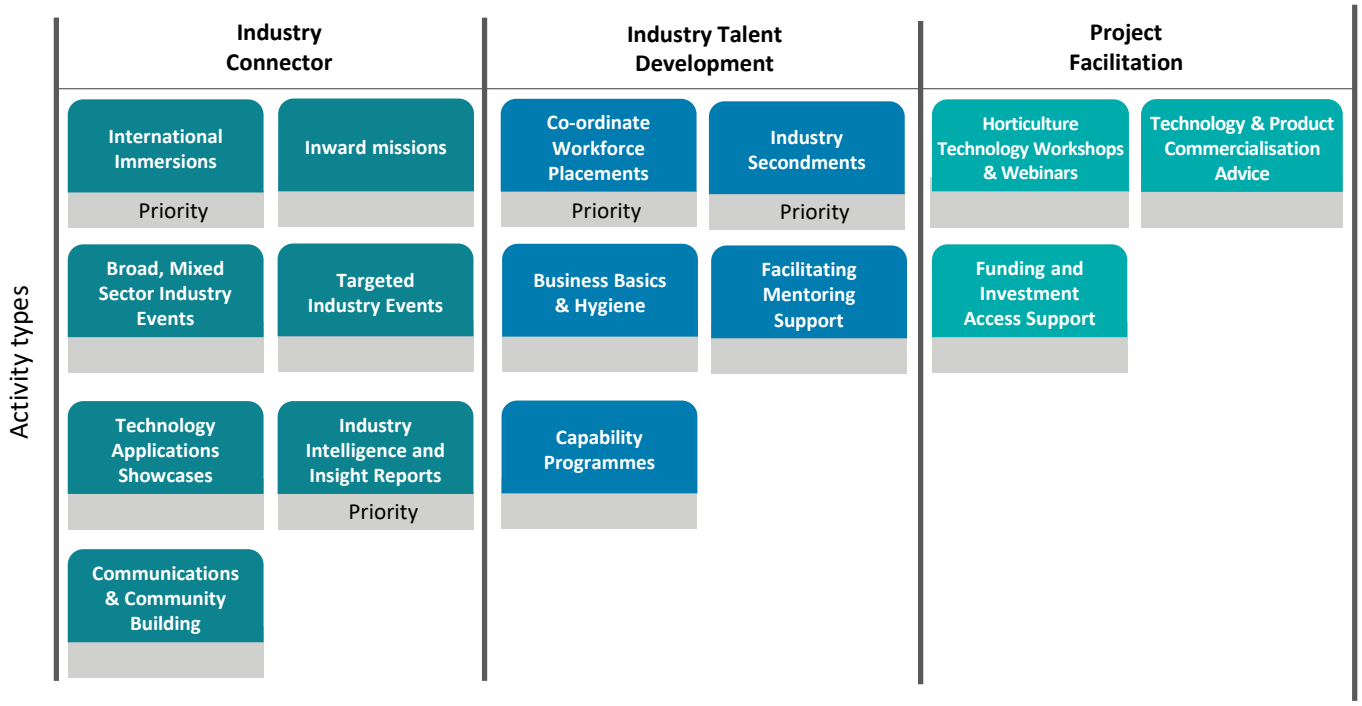
## What were the key findings and validations?

- Gathered feedback on pilots to date to further refine types of activities the Catalyst could offer.
- Activity types were further discussed and refined with the IRG to ensure these helped to reflect the scope and intent of the three core services under the Preferred Option.
- A collaborative exercise was conducted to determine what activity types the IRG would like to see less or more of through the Catalyst, to help inform a prioritised view of activity types to support implementation planning.

## What were the key findings / achieve?

- Validated service activity types with the IRG as appropriate for the Catalyst.
- Gained an understanding of what activity types the IRG sees as of most relevance and demand to the industry.

**Figure 41: Validating activity types**



# Appendix 6 Economic Impact of the Catalyst (2021)

To understand the economic impact of the Catalyst on the New Zealand economy, economic modelling was undertaken in 2021 to support the indicative business case and help provide a view of the indicative value that the Catalyst could help generate. Modelling was undertaken in 2021, and while the scope of the Preferred Option remains broadly the same, some assumptions and aspects of the delivery scope have since moved on (e.g. virtual delivery model; the scale of the future service contracts).

Economic modelling was undertaken in 2021, based on future scenarios. A Computable General Equilibrium (CGE) model was used to estimate the potential impact of the Horticulture Technology Catalyst based on two scenarios out to 2035:

- **A base case scenario:** Under the base case, the model assumes that the horticulture technology sector and the horticulture sector and related economic trends continue as we observe them today (i.e., a world without the Catalyst).
- **The Catalyst scenario:** This scenario models the New Zealand economy, assuming the Catalyst is established as per the Preferred Option (Option B), and its business activities commence. To account for the possible uncertainty of the magnitude of the impact of the Catalyst, modelled three Catalyst scenarios **- a low, medium, and high scenario.**

**Table 43: The catalyst scenario**

| Scenario | Effect of Catalyst's service | Outcomes on New Zealand economy |
|---|---|---|
| **Low** | • Industry Connector service is **less effective** at gathering industry intelligence and innovation insights, and connecting the industry, etc.<br>• Industry Talent Development result in **a smaller and limited** impact on the sector businesses.<br>• Project Facilitation service line is **somewhat effective** in providing impactful industry and commercial solutions. | • **Less effective** at growing New Zealand's horticulture technology sector<br>• **Limited growth** in labour productivity, exports, and number of firms exporting<br>• Smaller improvement in time to market<br>• **Smaller share** of businesses directly benefits from the Catalyst's services. |
| **Medium** | • Industry connector service is **effective** at gathering industry intelligence and innovation insights, and connecting the industry, etc.<br>• Industry Talent Development result in **a medium and expected** impact on the sector businesses.<br>• Project Facilitation service line is **effective** in providing impactful industry and commercial solutions. | • **Relatively effective** at growing New Zealand's horticulture technology sector<br>• **Some growth** in labour productivity, exports, and number of firms exporting<br>• Modest improvement in time to market<br>• **Moderate share** of businesses directly benefits from the Catalyst's services. |
| **High** | • Industry connector service is **more effective** at gathering industry intelligence and innovation insights, and connecting the industry, etc. | • **Most effective** at growing New Zealand's horticulture technology sector<br>• **Large growth** in labour productivity, exports, and number of firms exporting |

| Scenario | Effect of Catalyst's service | Outcomes on New Zealand economy |
|---|---|---|
| | • Industry Talent Development result in **a large and widespread** impact on the sector businesses,<br>• Project Facilitation service line is **highly effective** in providing impactful industry and commercial solutions. | • Large improvement in time to market<br>• **Greater share** of businesses directly benefits from the Catalyst's services. |

Based on the information provided, the CGE model indicates that the Catalyst has the potential to generate substantial positive economic impacts for New Zealand's economy.

If the Catalyst proceeds, the potential increase in GDP is estimated to fall within the range of approximately $141.9 to $347.1 million over 2022 to 2035 in present value terms (2019-20 dollars). These estimates include any reallocation of capital and labour from other regions and industries and therefore represent the net additional economic activity.

In total, the Catalyst would be expected to increase employment by between 128 and 271 FTEs on average each year (i.e. additional FTEs relative to the baseline). The estimates incorporate the movement of workers from neighbouring industries, thus reflecting net job creation. Estimated peak employment impacts from the Catalyst range from between 307 to 672 FTEs.

Importantly, the Catalyst also provides a benefit to exports, including from horticulture production and horticulture technology. In this context, between 2022 and 2035, the Catalyst adds between $46.6 million (low scenario) and $94.0 million (high scenario) to exports above the base case (in present value terms, discounted at 6%). It is assumed horticulture technology exports would rise to an annual peak ranging between $80.0 million (low scenario) and $160.0 million (high scenario) in 2035 as the Catalyst is rolled out. Horticulture exports from the Catalyst between 2022 and 2035 are estimated to be within the range of $16.5 million (low scenario) and $54.9 million (high scenario) (in present value terms).

**Table 44: CGE model**

| Catalyst Scenario | National GDP | | National Exports | | National Employment | |
|---|---|---|---|---|---|---|
| | Present Value 2022-2035 | Peak year GDP (year 2035 $m) | Present Value 2022-2035 | Peak year GDP (year 2035 $m) | Average FTEs | Peak year FTEs |
| **Low** | $141.0 | $48.8 (2035) | $46.6 | $24.7 (2035) | 128 | 307 (2035) |
| **Medium** | $217.5 | $78.8 (2035) | $68.8 | $36.5 (2035) | 184 | 457 (2035) |
| **High** | $347.1 | $126.1 (2035) | $94.0 | $49.8 (2035) | 271 | 672 (2035) |

# Appendix 7 Benefits Profiles

## Benefit 1: Innovation among horticulture technology companies is accelerated

| KPI 1 | Engagement with the Catalyst | |
|---|---|---|
| Measure | Number of companies using the Catalyst | |
| | Unit | Number of companies |
| | Baseline | 50-75% of horticulture technology companies per year |
| | Target | Increasing - Targets will be set by the Catalyst during the establishment phase and reviewed annually |
| | Source | Information to be provided by service providers engaged with customers of the Catalyst |
| Reporting | Forum | ITP Steering Group; MBIE |
| | Frequency | Collect quarterly, report annually |
| | Start date | July 2023 |
| | Reporting duration | Lifetime of the Catalyst |
| Responsibilities | Benefit Owner | Catalyst Director |
| | Measure Owner | Programme Manager |
| | Reporting | The Catalyst Team |
| | Other agencies involved | MBIE, MPI, NZTE, Callaghan Innovation, and other service providers |

| KPI 2 | Increase in commercialisation of innovation | |
|---|---|---|
| Measure | Number of companies that the Catalyst reports are commercialising innovation | |
| | Unit | Number of companies |
| | Baseline | Baseline TBD by Catalyst during establishment phase |
| | Target | Increasing - Targets will be set by the Catalyst during the establishment phase and reviewed annually |
| | Source | Tracked through the CRM systems of NZTE and Callaghan Innovation |
| Reporting | Forum | ITP Steering Group; MBIE |
| | Frequency | Collect quarterly, report annually |
| | Start date | July 2023 |
| | Reporting duration | Lifetime of the Catalyst |
| Responsibilities | Benefit Owner | Catalyst Director |
| | Measure Owner | Programme Manager |
| | Reporting | The Catalyst Team |
| | Other agencies involved | MBIE, MPI, NZTE, Callaghan Innovation, and other service providers |

## Benefit 2: Greater connectivity leads to improved access to horticulture technology and enables greater production for the domestic horticulture sector

| KPI 1 | Increase in application of technology in horticulture sector | |
|---|---|---|
| Measure | Number of horticulture growers using technology solutions | |
| | Unit | Number of companies |
| | Baseline | Baseline TBD by Catalyst during establishment phase |
| | Target | Increasing - Targets will be set by the Catalyst during the establishment phase and reviewed annually |
| | Source | Information to be collected through survey sent to horticulture growers |
| Reporting | Forum | ITP Steering Group; MBIE |
| | Frequency | Collect quarterly, report annually |
| | Start date | July 2023 |
| | Reporting duration | Lifetime of the Catalyst |
| Responsibilities | Benefit Owner | Catalyst Director |
| | Measure Owner | Programme Manager |
| | Reporting | The Catalyst Team |
| | Other agencies involved | MBIE, MPI, NZTE, Callaghan Innovation, and other service providers |

| KPI 2 | Maintained or increased growth in domestic horticulture production | |
|---|---|---|
| Measure | Domestic horticulture production | |
| | Unit | Percentage growth annually |
| | Baseline | 6.7% growth annually |
| | Target | Maintained or increasing - Targets will be set by the Catalyst during the establishment phase and reviewed annually |
| | Source | MPI quarterly SOPI reports, Statistics NZ reporting |
| Reporting | Forum | ITP Steering Group; MBIE |
| | Frequency | Collect quarterly, report annually |
| | Start date | July 2023 |
| | Reporting duration | Lifetime of the Catalyst |
| Responsibilities | Benefit Owner | Catalyst Director |
| | Measure Owner | Programme Manager |
| | Reporting | The Catalyst Team |
| | Other agencies involved | MBIE, MPI, NZTE, Callaghan Innovation, and other service providers |

## Benefit 3: Export of horticulture technology grows

| KPI 1 | Increase in horticulture technology companies exporting | |
|---|---|---|
| Measure | Number of horticulture technology companies exporting | |
| | Unit | Number of companies |
| | Baseline | Baseline TBD by Catalyst during establishment phase |
| | Target | Increasing - Targets will be set by the Catalyst during the establishment phase, and reviewed annually |
| | Source | Tracked through the CRM systems of NZTE and Callaghan Innovation |
| Reporting | Forum | ITP Steering Group; MBIE |
| | Frequency | Collect quarterly, report annually |
| | Start date | July 2023 |
| | Reporting duration | Lifetime of the Catalyst |
| Responsibilities | Benefit Owner | Catalyst Director |
| | Measure Owner | Programme Manager |
| | Reporting | The Catalyst Team |
| | Other agencies involved | MBIE, MPI, NZTE, Callaghan Innovation, and other service providers |

| KPI 2 | Increase in economic value of horticulture technology | |
|---|---|---|
| Measure | GDP contribution of horticulture technology | |
| | Unit | $ |
| | Baseline | Baseline TBD by Catalyst during establishment phase |
| | Target | Increasing - Targets will be set by the Catalyst during the establishment phase, and reviewed annually |
| | Source | Strategic service providers, and other industry reporting where available |
| Reporting | Forum | ITP Steering Group; MBIE |
| | Frequency | Collect quarterly, report annually |
| | Start date | July 2023 |
| | Reporting duration | Lifetime of the Catalyst |
| Responsibilities | Benefit Owner | Catalyst Director |
| | Measure Owner | Programme Manager |
| | Reporting | The Catalyst Team |
| | Other agencies involved | MBIE, MPI, NZTE, Callaghan Innovation, and other service providers |

# Appendix 8 Financial Assumptions

The purpose of this appendix is to detail the general assumptions that support the cost estimates within the Economic and Financial Cases.

Table **45** outlines the general assumptions used for both cases

Table **46** gives a description of the different expenditure groups

Confidentiality

**Table 46: Definition of expenditure groups**

| Expenditure Group | | Definition |
|---|---|---|
| Leadership and Management | | Relates to costs for the Catalyst Director, Programme Manager, other Catalyst staff, director fees, FTE driven operating costs, and travel provision. |
| Contracted Services | Industry Connector | Relates to the contracted services cost, supporting operating costs, industry events, and ongoing stakeholder engagement, communication and branding of the Catalyst. |
| | Industry Talent Development | Relates to the contracted services cost, supporting operating costs, and running events within this service. |
| | Project Facilitation | Relates to the contracted services cost, supporting operating costs, and the cost of external support and consultants. |
| Digital Presence and Tools | | Relates to the website build and video content for the Catalyst, ongoing operating expenditure, and a refresh of the website build and video content in 2028/29. |
| Contingency | | Relates to the relative amount of uncertainty in cost for each expenditure group in the model. |

[35] The discount rate has been sourced from Treasury financial reporting policies and guidance (https://www.treasury.govt.nz/information-and-services/state-sector-leadership/guidance/financial-reporting-policies-and-guidance/discount-rates)
[36] Labour cost index forecasted through Deloitte Access Economics macroeconomic view on labour inflation

Commercial information, Negotiations

Confidentiality, Negotiations