SCION™
FORESTS ▪ PRODUCTS ▪ INNOVATION

STATEMENT OF CORPORATE INTENT 2021 - 2024

Prosperity from trees - Mai i te ngahere oranga

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Scion profile

New Zealand Forest Research Institute Limited	New Zealand Forest Research Institute Limited – trading as Scion
Ownership	Crown owned entity (established under the Crown Research Institutes Act 1992)
Head Office	Tītokorangi Drive, Rotorua
Postal Address	Private Bag 3020, Rotorua 3046
Web address	www.scionresearch.com
Governance	Shareholder-appointed Board: Chair, Dr Helen Anderson QSO (2018); Directors Greg Mann (2017), Colleen Neville (2014), Dr Barry O'Neil (2012), Stana Pezic (2017), Dr Jon Ryder (2016), Steve Wilson (2016)
Executive Management	Chief Executive, Dr Julian Elder; Acting General Manager (GM) Finance and Corporate Services, Sharon Cresswell; GM Forests and Landscapes, Dr Tara Strand; GM Forests to Biobased Products, Dr Florian Graichen; GM Forests to Timber Products, Dr Roger Hellens; GM Marketing and Partnerships, Arron Judson; GM People, Culture and Safety, Cameron Lucich; GM Te Ao Māori and Science Services, Hēmi Rolleston
Staff	308 full-time-equivalent staff at three sites: Rotorua (275), Christchurch (31), Wellington (2), as at 31 May 2021 (excludes fixed term, student and postdoctoral staff)
Vision	Prosperity from trees - Mai i te ngahere oranga
Core Purpose	To drive innovation and growth from New Zealand's forestry, wood product and wood-derived materials and other biomaterial sectors, to create economic value and contribute to beneficial environmental and social outcomes for New Zealand
Values	Ingenuity, Collaboration, Excellence, Manaakitanga
Reporting	Reporting: Financial and non-financial performance against SCI targets is reported to the Shareholder quarterly and to the public via a six-month and annual report
Shareholder Funds	Shareholder Funds: Total book value of $48.177 million at 30 June 2020

Shareholdings

Company	Company type	Scion shareholding %
Te Papa Tipu Properties Limited	A land holding subsidiary	100.00
Biopolymer Network Limited	An incorporated joint venture	14.56
Kiwi Innovation Network Limited	A limited company funded by MBIE and owned collectively by the CRIs and some other public research organisations	6.67
WQI Limited (in liquidation) (T/A Solid Wood Innovation)	An MBIE-industry partnership in wood processing. WQI Limited is in voluntary liquidation and is not trading	5.05
Terax Limited Partnership (in liquidation)	A limited partnership to commercialise the Terax technology	50.00
Terax (2013) Limited (in liquidation)	The General Partner in Terax Limited Partnership	50.00
Sala Street Holdings Limited	Holds Scion's 50% share in both Terax (2013) Limited and Terax Limited Partnership	100.00

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Chair and Chief Executive overview

Forestry is recognised globally as a key part of a low-carbon, biobased economy. New Zealand is blessed with its forests – both our long-standing indigenous forests and those that are planted to be harvested.

Our forests collectively are a massive renewable resource with the scale needed to provide New Zealand with low-emissions materials and fuels to help meet our climate change commitments, grow and transform the economy and improve environmental and social outcomes.

Scion can help bring about this transformation through our purpose-driven capability and collaborative connections with industry, Māori and the regions. Being based in Rotorua, the heartland of forestry, gives us easy access to many who share our vision "Prosperity from trees - Mai i te ngahere oranga".

Globally Scion is recognised as a leader in the circular bioeconomy approach from growing renewable resources though to new materials and energy and to new manufacturing methods. We recognise, however, that the concept of 'circular bioeconomy' is not well understood in New Zealand and we must work at helping to raise awareness and understanding to gain support.

For New Zealand, we estimate the circular bioeconomy is a $30 billion opportunity. Scion's Strategy 2030 is centred around driving the innovation needed to realise this opportunity while also being well aligned to Government priorities especially around climate change...

Essentially, a circular bioeconomy is centred around people and nature – getting the most value out of renewable biological resources while minimising waste. For designers and product developers that approach creates opportunities. Instead of "take, make, waste" we need to think about how the product will be used and what its whole 'life' will be.

For New Zealand, we estimate the circular bioeconomy is a $30 billion opportunity. Scion's Strategy 2030 is centred around driving the innovation needed to realise this opportunity while also being well aligned to Government priorities especially around climate change, regional economic development, meeting Māori aspirations and improving wellbeing.

The world's climate change challenges are New Zealand's too, and Scion is committed to contributing our specialist capabilities and knowledge to help implement the recommendations from the Climate Change Commission's advice to government.

We can help the country build back better from the impacts of the COVID-19 pandemic through developing new economic opportunities by expanding the product portfolio from a tree. We can design new biomaterials (bioplastics, biofibres, biochemicals and biofuels) as import substitutes and new exports, and we can localise parts of the supply chain.

We are champions of building back better with our focus on zero or negative emission solutions. Our new building Te Whare Nui o Tuteata strikingly showcases this principle through its innovative design and use of high-tech engineered timber. Te Whare Nui o Tuteata represents much more too. It is a tangible example of our strong and growing connection with mana whenua and broader partnerships with Māori that we recognise are vital to how we can best contribute to Māori aspirations.

Our growing close relationship with mana whenua is directing the way we embed Treaty obligations within our business, developing how to get the best from bringing mātauranga and science together to deliver real benefit to Māori and New Zealand.

We are heartened by strong support received from the Research, Science and Innovation Minister and the Ministry of Business, Innovation and Employment (MBIE) for our strategy to deliver benefit for New Zealand and to maintain critical capability that New Zealand needs now and in the future.

To that end, we are embedding our organisational realignment that will enable us to better implement our strategy and ensure our research focuses on the impact and benefits needed for New Zealand's prosperity (economic, environmental and social).

In this document we present the three research impact areas and associated research portfolios. Each portfolio is being further elaborated currently and we are working with stakeholders to develop 'roadmaps to impact'. This is a vitally important process that informs all our planning and critical business decisions.

Robust and long-term partnerships are the key to Scion making impact, and we are putting deliberate focus and effort to build, maintain and nourish partnerships with Māori, industry, other researchers, local and central government and other players in the innovation ecosystem both existing and emergent.

We know change is ahead as a result of the MBIE-commissioned Te Pae Kahurangi Report into the role of Crown Research Institutes and also the outcome of MBIE's separate science review of Scion. We will participate constructively in implementing forthcoming recommendations.

Scion and the other six Crown Research Institutes deliver nationally important and relevant science for the sectors we serve. We, like our sister organisations, need adequate stable funding to future proof our core research capability and capacity to ensure we can deliver long-term impact.

Backed by our Strategy 2030 and our new organisational structure that will empower delivery we look forward to supporting New Zealand "build back better".

Dr Helen Anderson QSO
Chair

Dr Julian Elder
Chief Executive

Our role

Scion is one of seven Crown Research Institutes that carry out scientific research for the benefit of New Zealand.

Our core purpose

To drive innovation and growth from New Zealand's forestry, wood product and wood-derived materials and other biomaterial sectors, to create economic value and contribute to beneficial environmental and social outcomes for New Zealand.

Our vision

Prosperity from trees - Mai i te ngahere oranga

Our mission

Enhancing New Zealand's prosperity, wellbeing and environment through trees - Kia piki te ora, te taiao me te whai rawa o Aotearoa mā te ngāherehere.

Our context

Trees are arguably New Zealand's greatest renewable and sustainable resource. New Zealand has 10.1 million hectares of forest cover – 8 million hectares of indigenous forest and 2.1 million hectares of plantation forestry (mostly *Pinus radiata*). The value of all forestry exports (to December 2019) was $6.23 billion, including $3.45 billion worth of logs exported.

It makes sense for New Zealand to leverage this massive renewable resource. Forestry is a valuable resource with the scale needed to provide New Zealand with low-emissions materials and fuels to meet our climate change commitments, grow and transform the economy and improve environmental, social and cultural outcomes.

Climate change

New Zealand's climate change targets are to be carbon zero by 2050. To meet these targets New Zealand has to move to low, zero and carbon-neutral emissions technologies. Traditionally forests have been used as a temporary sink for carbon emissions, but they are also part of the permanent solution as a replacement for fossil fuel-based or high-emissions technologies. Climate change is the challenge of our generation, but let us not miss the opportunity of our generation to transition to a circular bioeconomy.

Circular bioeconomy

"Anything made from fossil-based materials today can be made from a tree tomorrow"

Stora Enso

A circular bioeconomy is centred around people and nature – getting the most value out of renewable biological resources while minimising waste. The essential concept at the heart of the circular bioeconomy is to ensure we can unmake everything we make in a clean non-polluting and regenerative way. For designers and product developers, that creates new opportunities. Instead of take, make, waste we now need to think about how the product will be used and what its whole 'life' will be – waste is a concept not found in nature.

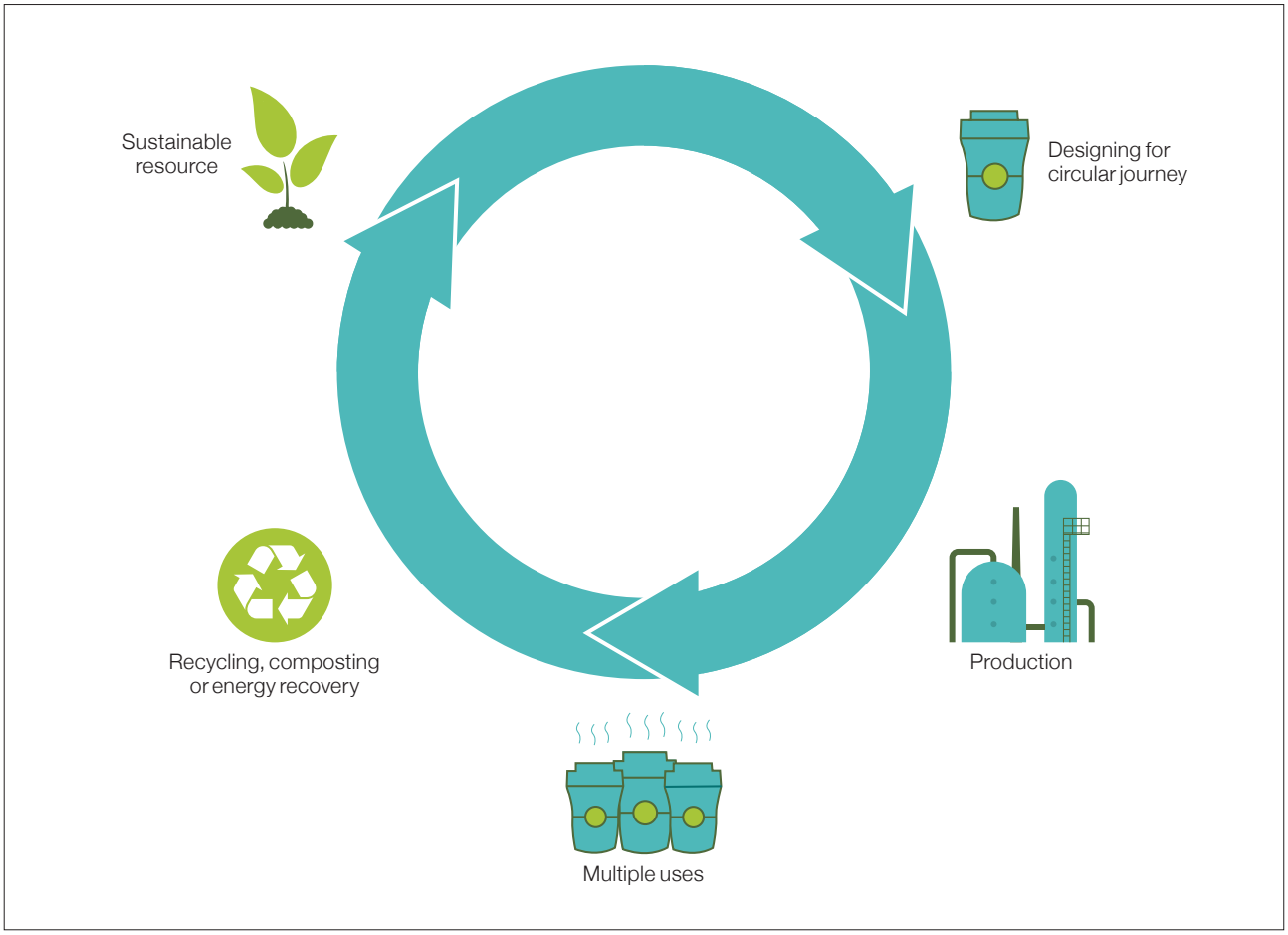

Figure 1: *A circular bioeconomy – prosperity in harmony with nature.*

This is not a new or untested approach. The market for materials and products made from renewable resources, particularly forestry, is developing fast. It is the way other large forest-rich economies are going in Europe and North America. Trees are the source of over 5000 products we use every day and more are added daily. New Zealand could become a global hub for a new high-value biomanufacturing sector, addressing both the challenge and opportunity of our generation.

New Zealand is well placed to realise the benefits of the circular bioeconomy because we already have a strong biobased economy, an extensive plantation forestry sector and relatively low infrastructure and economic dependence on fossil fuels. But we must act quickly or risk getting left behind other countries' responses to the opportunity.

Scion estimates the circular bioeconomy is a $30 billion opportunity for New Zealand.

Significance to Māori

Forests and trees are culturally significant to Māori. They are central to the distinct worldview that is Te Ao Māori.

New Zealand's forests also represent a significant economic and social opportunity for Māori. Māori already have more than $2 billion of assets in forestry. As Treaty settlements continue to conclude, Māori ownership of land, forests and geothermal assets will increase. The Māori economy is rising with land-based activities, tourism and property interests. However, challenges remain with fragmented land ownership, remoteness from other commercial activities, accessing working capital, managing inter-generational investment and developing employment.

Despite these challenges, the Māori economy is on the move and early indications reveal an impact on current and future models of forestry, such as increasing species diversity and focus on planting for non-timber values.

Regional economic development

As a regionally headquartered Crown Research Institute, Scion is uniquely placed both to understand the regional nature of forestry, wood processing, biobased industries and what might be needed to create new and innovative regional development opportunities.

We are co-located with our industries and close to major forests. Scion's campus – Te Papa Tipu – is already an innovation park with over 30 different organisations and companies, including Te Uru Rākau – New Zealand Forest Service, Department of Conservation, Timberlands, Oji Fibre Solutions and PF Olsen.

The relationship between Scion and regional New Zealand is particularly pertinent in Rotorua, physically, economically and culturally. As the third largest employer in Rotorua, many people rely on Scion staff directly and indirectly for their livelihood. Scion provides a wide variety of jobs including highly skilled science jobs and a range of corporate, technical, nursery and field support roles.

Scion has strong links and strengthening partnerships with local iwi, including Ngāti Hurungaterangi, Ngāti Taeotu, Ngāti te Kahu, and our wider iwi of Ngāti Whakaue and Te Arawa.

Enabling scale-up for new bioeconomy enterprises

The New Zealand innovation system has a key gap that constrains new bioproduct development. While promising lab-scale development is carried out, lack of pilot scale facilities allowing the scale-up of technologies using new biomaterials makes it difficult to prove commercial viability and attract investment.

Such dedicated scale-up infrastructure would link carbon substitution in the circular bioeconomy, boost regional economic development, through localised processing, and provide a significant opportunity for emergent and iwi-owned companies.

An open-access biopilot facility would provide new biobased products from existing primary sector residue streams thereby transforming waste and accelerating New Zealand's economic transition with a focus from volume to value. This parallels the similar, in terms of benefits and need, scale up infrastructure in the Food Innovation Network.

Scion is championing the creation of a National Bioproduct Pilot Plant (BioPilot) at Te Papa Tipu Innovation Park in Rotorua to concentrate interactions between science and industry and accelerate innovation uptake. The location is ideal being the home of Scion and 30 other linked business partners, is close to forestry and other primary sector resources and waste streams and has Toi Ohomai Institute of Technology nearby.

We are seeking investment partners from central and local government to create a national bioproduct innovation hub dedicated to the scale-up and associated de-risking of new onshore manufacturing industries. Such a hub is key to New Zealand's transition to a circular bioeconomy.

Our operating environment

Government priorities

Three broad government priorities are most relevant to Scion: primary sector production, climate change mitigation and industry transformation (both wood and advanced manufacturing). Scion's work also contributes to policies around improving the environment, conservation, waste management/reduction, regional economic development and Māori development.

A key Government priority is its response to the Climate Change Commission's advice on reducing New Zealand's emissions. Scion's research in indigenous trees, plantation pine forestry and biofuels from biomass can support implementation of the Commission's recommendations in those areas.

An ambition for Aotearoa to be a net carbon sink could be enabled via three mechanisms: carbon sequestration (planting trees for standing sequestration), carbon storage (planting trees for use in wood products, including tall buildings), and carbon substitution and recycling (enabling a biobased economy). The actions proposed by the Climate Change Commission and additional suggestions by Scion will help kick start Aotearoa on this journey.

The Ministry for Primary Industries' roadmap *Fit For a Better World: Accelerating our economic potential* (ISBN: 978-1-99-002545-7 (online)) sets out the Government's policy and plan for the primary sector. Forestry features strongly in this policy with goals around transforming the forestry sector, refocussing tree planting and partnerships and the Te Taiao Framework (on regenerative agriculture). Scion is a science co-lead, with AgResearch and Manaaki Whenua – Landcare Research, on three of the *Fit For a Better World* accelerators: zero-carbon production systems, landscape decision making and social science practice for change.

We have aligned portfolios of research to the Ministry for the Environment's *Conservation and Environment Science Roadmap* (ISBN 978-0-908339-93-8 (online)), specifically to help meet themes around mātauranga Māori, climate change and biosecurity outcomes.

A key goal of the Government's economic development policy is industry transformation, centred around six industry transformation plans (ITP). Relevant to Scion are the Forestry and Wood Processing ITP and the Advanced Manufacturing ITP.

Scion is working closely alongside Te Uru Rākau – New Zealand Forest Service on the Forestry and Wood Processing ITP to gain wide stakeholder perspectives on the ITP and ensure our relevant portfolios are aligned with those perspectives and our knowledge and expertise are applied to its development. Similarly, we are continuing to engage with the Ministry for Business, Innovation and Employment (MBIE) on the Advanced Manufacturing ITP.

COVID-19 recovery

In our last SCI we could only speculate what impact COVID-19 would have on New Zealand. We, like many others, saw the pandemic as an opportunity to transform the way New Zealand did things. As Prime Minister Jacinda Ardern said we need to "build back better".

The health, economic and social impacts of COVID-19 have not been as bad as predicted for New Zealand. As a result, some of the urgency and impetus about transforming our economy has abated, but the opportunity remains.

Forestry can, and should, play a big role in realising that opportunity.

Science system

Scion operates within the New Zealand science system and is influenced and affected by the settings of that system.

A review of the role of Crown Research Institutes and their status within the science system was commissioned by MBIE resulting in the Te Pae Kahurangi Report, published in July 2020. Findings and recommendations are being considered by the Minister of Research, Science and Innovation. We recognise that there will be some change for all Crown Research Institutes over the coming year. Scion will continue to constructively engage in this review process and in the implementation of the Minister's decisions to evolve the science system to deliver even more against New Zealand's future needs.

As part of the joint Scion/MBIE working group on Scion's long-term funding, MBIE commissioned a separate science review of Scion. Before finalising what a long-term funding solution might look like, this review was to provide independent validation of the core scientific capability provided by Scion, the fit with New Zealand's future needs, Scion's ability to support government priorities and its ability to respond effectively to emerging changes.

The review's recommendations were received as this document was finalised. Scion will work with MBIE and the Ministry for Primary Industries in determining what an appropriate long-term funding solution should look like incorporating all the inputs into this process including the recommendations from the science review.

Scion's funding, like all Crown Research Institutes, is a mix of Strategic Science Investment Funds (SSIF), large contestable

Endeavour Fund projects and contract research projects with government departments and private sector businesses.

This year Scion began moving to a matrix model that emphasises partnerships with stakeholders. Over the next six months, new portfolio leaders across 11 new groups will co-design their strategy with external stakeholders, and future strategic management in the allocation of SSIF will reflect that new direction. We are also developing stronger strategic and advisory relationships with one of our biggest stakeholders, Ministry for Primary Industries, in particular on the Forestry and Wood Processing ITP.

Various reviews of Crown Research Institutes in recent years have emphasised the importance, relevance and impact of the science the institutes do. These reviews have recommended that adequate stable long-term funding needs to be provided to future proof the institutes' core research capability and capacity to achieve impact.

Our research impact areas

Scion's science is delivered under three research impact areas and associated research portfolios. Each portfolio is being further elaborated, and roadmaps to impact are being developed with stakeholders currently.

Impact Area 1

Forests and landscapes

To grow healthy, resilient forests that are planted primarily for their standing forest benefits.

Goals

- 100% increase in the use of forests for human health and wellbeing
- Converting 30% of underused Māori land to standing forests
- Optimisation of planting and growing indigenous forests
- New forest systems planted and managed

Portfolios

- Establishing indigenous forests
- Restoration, protection and mauri of Te Waonui a Tāne
- Designing forests - Mahi Tahi Whaihua

Key stakeholders

Crown Research Institutes (CRIs) and university collaborators and national science challenges, Māori landowners, regional councils, government entities, environmental afforestation companies, forestry industry representatives.

SSIF Allocation 2021/22: $2,840,274

Establishing indigenous forests

This portfolio covers seedling to canopy closure and aims to make native forest establishment as easy and economically viable as possible. The scope of this portfolio will weave mātauranga with Scion's knowledge and experience in planted forests. The portfolio extends from germplasm selection and seedling propagation, through to establishment of successfully growing forests at canopy closure. We will also explore the opportunity for mixed use forests with under-storey crops.

Big focus points to 2030 are: Growing healthy nursery stock utilising automation, breeding and disease monitoring. Understanding the ecophysiology of climate, soil weeds and microbiome on healthy forest establishment. The natural flow of genetics between rohe, the role of eco-source boundaries, rohe based seed industries and database tracking of important taonga genetic material. Economic incentives to establish indigenous forests, including under-storey crops that realise the value within indigenous forests.

Key stakeholders: CRI and university collaborators and national science challenges; Māori landowners; regional councils; government entities; environmental afforestation companies.

Restoration, protection and mauri of Te Waonui a Tāne

This is a mātauranga-led portfolio to bring maximum value to standing indigenous forests for today and the generations to come. The scope of this portfolio covers our existing indigenous forests. Mātauranga supported with science will protect and restore the estate, and develop adaptive forest management principles.

Big focus points to 2030 are: Co-designed mātauranga-based research with Māori. A shared values framework for standing forests that develop cultural parameters for holistic forest management and baselines for the quantitative and qualitative benefits to humans. Adaptive intergenerational stewardship for climate shifts on nutrient and water cycles with culturally appropriate decision making. Mātauranga-based solutions for climate profile pathogen risks with rapid detection, delimitation and diagnosis. New biosecurity technologies for the indigenous estate. Understanding wildfire risk and mitigation methods in a warming climate, and building resilience to disease already prevalent (kauri dieback and myrtle rust) in New Zealand.

Key stakeholders: CRI and university collaborators and national science challenges; Māori landowners; regional councils; government entities; environmental afforestation companies.

Designing forests - Mahi Tahi Whaihua

This portfolio is about designing forests to meet a need. The forests can be indigenous, exotic, or novel fusions of both to meet delivery of portfolios of ecosystem functions. We will use environmental engineering principles, mātauranga, tree ecology, and forestry sciences with a focus on New Zealand's big issues. The portfolio covers enhancing our urban environments, and engineering resilience to climate change and sea-level rise. It includes trees and forests in rural landscapes that balance portfolios of ecosystem services, and climate adaptation of natural forests to provide security of above and below ground carbon.

Big focus points to 2030 are: Urban forests that increase people's health and wellbeing, increased biodiversity, protection of coastal margins, diversion of waste-water discharge and avoided costs of climate change. In rural landscapes, mātauranga-based solutions will link with environmental engineering principles that connect ecosystem services, spanning water quality, carbon budgets to biodiversity across mosaics of land-use types that are co-designed by the community. Indigenous and fusion forests that provide multiple ecosystem services driven through carbon monitoring with optimised indigenous species for the environment and improved carbon capture datasets.

Key stakeholders: CRI and university collaborators and national science challenges; Māori landowners; regional councils; government entities; environmental afforestation companies, forestry industry representatives.

Impact Area 2

Forests to timber products

Development of products, manufacturing, high-value trees and healthy, resilient forests that capture an increasing share of the global high-end market for timber.

Goals

- Increase GDP by $10 billion through low emission, forest diversity, timber products and sustainable and healthy communities
- 1 million tonne of CO_2 reduction from the adoption of circular principles
- New Zealand communities adopting circular living concepts

Portfolios

- Trees to high-volume wood products
- Trees to high-value wood products
- Indigenous trees for distinct value wood products
- New value digital forests and wood sector

Key stakeholders

Breeding companies, nurseries, forest growers managers and owners, wood processors, construction industry, farmers, BRANZ, carbon accountants, exporters, government entities, regional councils, engineers, architects designers and planners, wood product manufacturers, CRIs and universities, hapū, whanau and iwi trusts, Māori owned nurseries, Waitangi Tribunal, Te Tumu Paeroa, AgTech, data warehouses, early adopter growers and processors, technology companies.

SSIF Allocation 2021/22: $11,303,738

Trees to high-volume wood products

This portfolio underpins the back bone of our $6.8 billion forest industry which is growing trees, mainly *Pinus radiata*, for a range of high-volume wood products. Translated briefly, it means: "*#LoveRadiata!*". From contemporary and next generation breeding to solid timber, this portfolio aims to enable resilient, highly productive and sustainable forests that produce solid wood for export and processing into a range of exterior and interior structural products (such as joinery, decking, poles).

The scope of this portfolio includes tree microbiome, biotechnology, breeding and propagation to increase productivity and resilience to abiotic and biotic threats; biosecurity to protect our forests from new and existing pests and diseases; forest management and environmental stewardship to enable increased productivity within sustainability limits. The portfolio also includes harvesting and construction research to optimise the value from volume and ensure safe practice.

Big focus points to 2030 are: Next generation breeding technology utilising genomic resources and "microbiome by genotype by environment" interactions to facilitate rapid and accurate breeding selection and deployment. Growing a positive reputation for our planted forests and retaining our licence to operate by embracing "green technology", championing the national recognition of multiple ecosystem services and securing market-access for our export products. Protection and diversification with contingency species, de-risking emerging product market, and biosecurity for new and emerging pests.

Key stakeholders: Breeding companies, nurseries, forest growers managers and owners, wood processors, construction industry, farmers, universities, BRANZ, carbon accountants, exporters, government entities.

Trees to high-value wood products

This portfolio covers seedling to forest to products and their impacts on communities, natural environment and the economy. The aim is to identify opportunities to maximise social, economic and environmental value across the forest-wood-community integrated value system. In essence, the goal is to enable the forest-based bioeconomy and sustainably sourced high-value-added wood products to deliver a sustainable future and intergenerational wellbeing. The scope of this portfolio covers both exotic and hardwood trees, forest production systems that enable value-added products, high-value wood products and construction systems in our buildings and environments and a forest-wood-community integrated value system that embraces circular principles and living concepts.

Big focus points to 2030 are: Tree design and innovation that explores speciality tree species and hybrids, with genetics tailored to unique environments, for valuable products, durability and resilience. Next generation productive forests that explore mixed species, respond to climate change, are resilient to pests, disease and wilding and deliver regenerative forest management and harvesting principles. Wood modification to deliver performance, appearance and function through to timber design and construction performance into carbon negative buildings. Underpinning research to influence policy that removes barriers to the use of wood in circular environments, with clear pathways to increase the sustainable use of wood in healthy buildings.

Key stakeholders: Government entities, regional councils, wood processors, engineers, architects designers and planners, wood product manufacturers, CRIs and universities.

Indigenous trees for distinct value wood products

This portfolio bundles the intrinsic, cultural, economic, and environmental value of our unique indigenous trees and lands. It is about developing business opportunities that are Māori led and science and sector supported delivering new benefits to regions. The scope of this portfolio spans co-innovation pathways, protocols, and benefit sharing to unlock the potential of specialty indigenous supply chains and products.

Big focus points to 2030 are: Certification of indigenous land whakapapa, tagging of mother trees to improve traceability, provenance, and seed ownership for cultural exchange will increase the distinct value from indigenous trees. Unlocking the potential of speciality indigenous wood products with unique Aotearoa cultural philosophies, design thinking to develop novel indigenous supply chains incorporating tikanga, science and industry know-how and incorporation of mātauranga Māori inspired wood uses for high-value export-ready appearance products.

Key Stakeholders: Hapū, whanau and iwi trusts, Māori owned nurseries, forestry and wood processing companies, non-Māori owned forestry and wood processing companies, government entities, Waitangi Tribunal, Te Tumu Paeroa.

New value digital forests and wood sector

This portfolio is about driving digital-led transformation to enable digital service providers to improved accuracy, optimisation and precision from seed to product. It includes digital ecosystem collaboration and transparency; supply chain digitisation to support a multi-faceted forest-based economy and pathways to new business models, digital products and services driven by industry. The scope covers

digitisation, automation and traceability to support next generation precision forest management; and decision support throughout to optimise the supply chain. All activities use experiential technology to uncover new knowledge and innovation opportunities.

Big focus points for 2030 are: Digitisation and automation of propagation science in nurseries and tissue culture at the start of the digital supply chain. Digital support for next generation precision forestry practice with GPS and real-time enabled tracking of individual trees, automated planting and thinning, risk surveillance, and development of next generation growth models with artificial intelligence. Automated predictive harvesting will secure greater value from log segregation and whole tree biomass and securing more continuity along the supply chain. Emerging technology to support traceability, transparency and transformation from seed to timber product, use of digital twin experimental forests, virtual reality to unlock below ground and within tree exploration, supply chain digitisation to support emerging products and the forest-based economy, real-time degradation monitoring in buildings and support for new business models and services utilising Scion datasets.

Key stakeholders: Universities, AgTech and CRIs, data warehouses, early adopter growers and processors, technology companies.

Impact Area 3

Forests to biobased products

Development of products, processes, manufacturing, trees, other biomaterials and healthy, resilient forests to replace petrochemicals and non-sustainable materials.

Goals

- Three biorefineries (one indigenous)
- $20 billion sustainable GDP growth
- 2500 regional high-value jobs
- 300 million litres and $2 billion fuel and plastics substitution
- 10 million tonnes reduction in CO_2 equivalents.

Portfolios

- High-value biorefineries
- Bioproducts and packing
- Distributed and circular manufacturing
- Integrated bioenergy

Key stakeholders

Government entities, international circular bioeconomy entities, forest growers, wood processors, iwi owned companies, regional councils, fine chemical, pharma and nutraceutical companies, disruptive companies, national and international brands, industry associations, composters, plastic manufacturers, innovative resource and biotech companies, engineering companies, primary industries, investors outside the traditional value chain.

SSIF Allocation 2021/22: $8,858,833

High-value biorefineries

This portfolio ensures that New Zealand's companies are fit to benefit from the global shift to sustainable and ecologically responsible chemical resources. Biorefineries will be at the heart of new industries producing novel chemicals derived from radiata pine, indigenous and exotic plants. These refineries will become the centre piece of a new cross-sectorial, high-value biomanufacturing industry. The scope of this work will deliver impact in GDP growth and regional high-value jobs. Products will feature high-value bioactive compounds and specialty/ fine chemicals largely for export into the global chemical supply chains utilising feedstocks of radiata pine, exotic and indigenous species, short-rotation trees, designer trees for high-value chemicals, other biomaterials.

Big focus points for 2030 are: Indigenous high-value biorefineries that interweave Māori leadership, knowledge and ownership supported by science and building a novel sector underpinned by our unique indigenous feedstocks defined with a Māori worldview in mind. Waste to high-value that turns biomass side streams, currently discarded or landfilled, into fine chemicals will build cross-value chain consortia and unlock a new biomanufacturing sector. Transformation of today's pulp and paper mills into bioproducts mills and biorefineries, beyond pulp and paper, into economic resilience. We will explore emerging biorefinery opportunities with exotic species and work wider than the established forestry and pulp and paper sector and use virtual biorefineries to optimise and assess the technical and sustainability impacts of different biorefinery approaches.

Key stakeholders: Government entities, international circular bioeconomy entities, forest growers, wood processors, iwi owned companies, regional councils, fine chemical, pharma and nutraceutical companies, brand owners and disruptive companies.

Bioproducts and packaging

This portfolio works with and enables New Zealand designers, companies and consumers to create, manufacture and use bioproducts and packaging for a sustainable future. This approach integrates advanced biomaterials into a variety of industries and sectors, impacting a myriad of industrial value chains creating sustainable jobs and unlocking future investments. The scope of this portfolio is GDP growth and regional high-value jobs through designed biobased products from high-value biomaterials including holistic sustainable packaging solutions using radiata pine, other species, short rotation trees, biomaterials as appropriate, Māori inspired feedstock, designer trees for performance fibres.

Big focus points for 2030 are: Onshore manufacture of bioproducts and biopolymers including plastic substitutes such as polyhydroxyalkanoates (PHAs) and beyond. These products have inbuilt compostability addressing the plastic and fibre recycling challenge, are uniquely New Zealand with indigenous and novel fibres and developed with innovative designers, are Māori-led with co-design opportunities and ensure overall circularity across the value chain. We will encourage onshore production of new bioproducts developing easy transfer of technology to New Zealand companies. Low-emission, non-toxic biobased coatings and adhesives, that are fit for purpose for interior, exterior or even food-based application. We will harness nature's ability to use greenhouse gases to make novel bioproducts.

Key stakeholders: Government entities, forest growers, wood processors, national and international brands, industry associations, composters, plastic manufacturers, iwi owned companies, regional councils, innovative resource and biotech companies.

Distributed and circular manufacturing

This portfolio accelerates and contributes to thriving regions through de-centralised, distributed and circular manufacturing approaches. The aim is conversion of underutilised, scattered or seasonal forest and/or agro-based biomass resources into intermediates and products. This approach will break up traditional (centralised) manufacturing by combining scalable processing, emerging new technologies and biomass supply and demand predictions. It will create new thriving regional industries, build new manufacturing models and value creation from new networked eco-industrial systems. The impact will come from regional high-value jobs and fuel and plastics substitutions (imports). Regions will thrive through distributed manufacturing and customised product design - Māori inspired products that use primary industry side streams, in forest/timber manufacturing waste, as well as Māori inspired feedstocks.

Big focus points to 2030 are: Downsizing, modularising and mobilising the biomass conversion process which means taking the equipment to the resource. A distributed approach that reduces transport of volume and provides opportunities for new skilled employment in regions. Key will be developing the extruder as a chemical reactor to demonstrate turning slash to value-add biochemicals. Distributed manufacturing also has an advantage of being flexible so can implement new and emerging technologies, which provides opportunities for Māori communities and companies. Pulling these pieces together and developing networked eco-industrial regional 'symbiosis' beyond what was achieved in Kawerau.

Key stakeholders: Government entities, regional councils, forest growers, wood processors, processing and engineering companies, iwi owned companies, New Zealand primary industry, investors outside the traditional value chain.

Integrated bioenergy

This portfolio will position bioenergy as part of the transition away from fossil fuels. Modern bioenergy is an essential component of the future low-carbon global and New Zealand energy systems if global climate change commitments are to be met. Bioenergy is the main source of renewable energy today, contributing to energy used in power generation, heat for industry and buildings and for transport. The scope of this portfolio is to deliver impact through fuel and plastic substitution and therefore reducing CO_2 equivalents. Products we are focusing on are biojet, marine biofuels, solid industrial energy carrier and biohydrogen manufacturing and uptake in New Zealand. This will use radiata pine and other species where short rotation crops and waste streams are available.

Big focus areas to 2030: Aviation fuel is a highly regulated market that is unlikely to use electrification and hydrogen. Liquid biofuels from biomass feedstocks are available now and are blended with fossil fuels, but will require mandates and targets to be set in aviation biofuels. Marine fuels is another sector linked to liquid biofuels, with 99 percent of ships using liquid fossil fuels, there is a need to replace "like for like". Replacements for coal using existing biotechnology are near term and swapping coal for bio-coal made from renewable resources utilising forestry and mill residues, is a fast way for New Zealand to remove the greenhouse gas. The technology to produce biohydrogen from biomass is an alternative sustainable energy source still at early stages. Combined with existing carbon capture and storage (CCS) technologies, biohydrogen offers the unique opportunity to create negative carbon emissions.

Key stakeholders: Government entities, fuel companies and refineries, large end-users of energy, forest growers, wood processors, conversion technology providers, iwi and emerging companies.

Critical next steps

To meet our 2030 goals we need a strong partner and stakeholder eco-system with clear opportunities to not only design the research but co-develop and deliver the critical work identified.

Partner and stakeholder engagement

We will work together with partners and stakeholders, across the quadruple helix of government, research entities, industry and iwi, to map critical pathways to 2030 identifying where we can interconnect, support and create a value exchange to guide future research programmes and projects.

Exploring connections

We will identify early how we work together with partners and stakeholders. Areas of integration or aligned impact will be pinpointed. The sequence of critical milestones to reach our 2030 goals will be identified.

Roadmaps to impact

We will finalise roadmaps to 2030 by portfolio with clear identification of where and how partners and stakeholders will engage. Development of Vision Mātauranga statements and the foundation for deeper programme planning efforts will be undertaken.

Partnerships to deliver impact

Meaningful long-term partnerships are required for our strategy to succeed in creating meaningful impact for New Zealand. Examples of impact are more forests being planted to protect land or sequester carbon, or more exports of high-value timber or energy from trees replacing oil. Delivery of impact can only be achieved through robust partnerships across all players along the innovation pathway adapting science to achieve a business, social or environmental outcome.

Scion will continue to build on and increase existing partnerships it has through workshops, joint planning, two-way partnerships, including with iwi organisations, and to extend these partnerships to key influential end-users such as in housing and transport.

Building powerful co-innovation partnerships with Māori

Co-innovation with all sector partners is important as is strengthening integration with mātauranga Māori. Scion is developing a Māori Forestry Roadmap aimed at implementing a co-innovation model with Māori that will ensure Te Ao Māori is at the heart of research and ensuring that mana, mauri, mahi and moni are integrated alongside the use and protection of mātauranga Māori.

Scion will build science and research partnerships with Māori with a focus on enhancing Māori use of land and forestry resources to realise the economic, social, environmental and cultural opportunities of the circular bioeconomy.

MBIE's Vison Mātauranga funding programme will be a key enabler of partnerships with Māori and building capability for co-innovation.

Innovating with industry

Scion's traditional industry stakeholders include the (mostly *Pinus radiata*) nurseries, forest growing companies and wood processing and manufacturing (timber and pulp and paper) companies. Interest is increasing from existing and new stakeholders, including Māori, in growing and using indigenous trees.

Most definitions of the forest industry focus on forest growing and wood manufacturing. Trees, however, can be made into a wide variety of materials suitable for general manufacturing such as bioplastics, biochemicals, biofuels and bioenergy.

Increasingly Scion's stakeholders include plastics manufacturers, fuel and energy companies, primary producers interested in sustainable packaging and other solutions and industry bodies that support them, such as Plastics New Zealand.

Some of the materials and innovations Scion works on may form the basis of industries that are nascent or do not exist in New Zealand, such as biochemicals. This presents a funding challenge as industries still to emerge cannot provide research and development funding for the science to underpin those economic development opportunities.

Commercialisation remains an important focus for Scion as we develop new industry partnerships across the forestry and wood processing value chain and creating opportunities for adding value to these partners.

To foster entrepreneurial thinking and lead to future innovator founders of new technologies, we will continue our internal accelerator programme 'Innovation Jumpstart'. The programme takes propositions from idea to pitch leveraging pre-seed accelerator funding support from MBIE.

Government

In addition to funding science, the Government is a consumer and end-user of science, both to inform government policy development and for government operations. Our "Right tree, right place, right purpose" Strategy 2030 continues to be highly relevant with significant opportunity for New Zealand in the context of climate change and building back better from COVID-19 impacts.

Scion's research around forest systems, ecosystems, biodiversity, water quality, carbon sequestration by trees, fossil fuel substitution (such as biofuels and bioplastics) and distributed manufacturing all provide useful evidence to inform the development of government climate change, biodiversity, environmental and economic policies. Scion is increasingly submitting on a range of government policy consultations through the Ministry for the Environment, the Climate Change Commission, Department of Conservation and the Ministry for Primary Industries. We have taken a direct role with the Ministry for Primary Industries on the next steps for their *Fit for a Better World* and Wood Industry Transformation programmes. We have aligned portfolios of research to the Ministry for the Environment's *Conservation and Environment Science Roadmap*, specifically around mātauranga Māori, climate change and biosecurity.

Key government operational responsibilities such as biosecurity (through Biosecurity NZ as part of Ministry for Primary Industries) and rural fire prevention and fighting for Fire and Emergency New Zealand are also advanced and informed by Scion's research in these areas. This work provides significant public benefit for New Zealand as a whole.

Science system collaboration

Bringing together multiple perspectives through science collaborations yields better more robust solutions and innovation. Scion actively collaborates with other Crown Research Institutes, New Zealand universities and research organisations and with international research organisations. Key examples of these collaborations are:

- ***Kauri dieback and myrtle rust*** includes Scion, Plant and Food Research and Manaaki Whenua – Landcare Research collaborating with Māori and government to combat both diseases;
- ***Bioprocessing Alliance*** (joint with Callaghan Innovation, Plant and Food Research, AgResearch and a number of universities) works to advance innovation in the manufacturing of biological residues into new products;
- ***Better Border Biosecurity (B3)*** is a collaboration between Ministry for Primary Industries, Department of Conservation, Plant and Food Research, AgResearch, Scion and primary sector industry bodies using science to improve New Zealand's biosecurity system;
- ***National Science Challenges*** (Science for Technological Innovation; Our Land and Water; New Zealand's Biological Heritage; Resilience to Nature's Challenges; and Building Better Homes, Towns and Cities) to research a range of problems ranging from disease and pest management/ eradication, microbiomes, urban infrastructure, 3D printing, robotics to biomechanics;
- ***International collaborations*** including with VITO Research in Belgium (on lignin, purification systems, 3D printing and circular bioeconomy) and VTT Research Finland (on circular bioeconomy, hardwood materials, and packaging).

Scion is also an active member of Science New Zealand, collaborating with other Crown Research Institutes on science research and joint projects to support the science system, such as the National Environmental Data system, science policy and general operational coordination.

Te Papa Tipu Innovation Park

Scion's campus – Te Papa Tipu – is already an innovation park with more than 30 organisations and companies, including Te Uru Rākau – New Zealand Forest Service, Department of Conservation, NIWA, Timberlands, Oji Fibre Solutions and PF Olsen.

Scion's new building, Te Whare Nui o Tuteata, marks the next step in Scion's leadership and growth in providing a hub for innovation between Scion and its partners (government, private sector and local community). We intend to use part of the building as a partnership and innovation space for our stakeholders.

The opening of Te Whare Nui o Tuteata brought about the removal of a large fence around Scion. With open access to this part of the campus, visitors to The Redwoods - Whakarewarewa Forest can now directly connect with Scion and through our new exhibition see how research helps grow our forests and transform forestry into the future.

The building also strengthens the connection between Scion and the local tangata whenua and their ancestral land. The name Te Whare Nui o Tuteata was gifted by Ngāti Hurungaterangi, Ngāti Taeotu and Ngāti Te Kahu (Ngā Hapū e Toru) who hold mana over the Scion campus and innovation park, Te Papa Tipu. It is another step in Scion's growing relationship with Māori and our intention to support Māori aspirations through our research.

Supporting science and enabling impact

Critical to achieving the objectives of Scion's Strategy 2030 is having an organisation that is efficient at delivering high-quality science and facilitating use of that science to create impact.

To support Scion's shift to an impact-focused organisation Scion has undertaken an organisational realignment over the last year and continuing into this coming year.

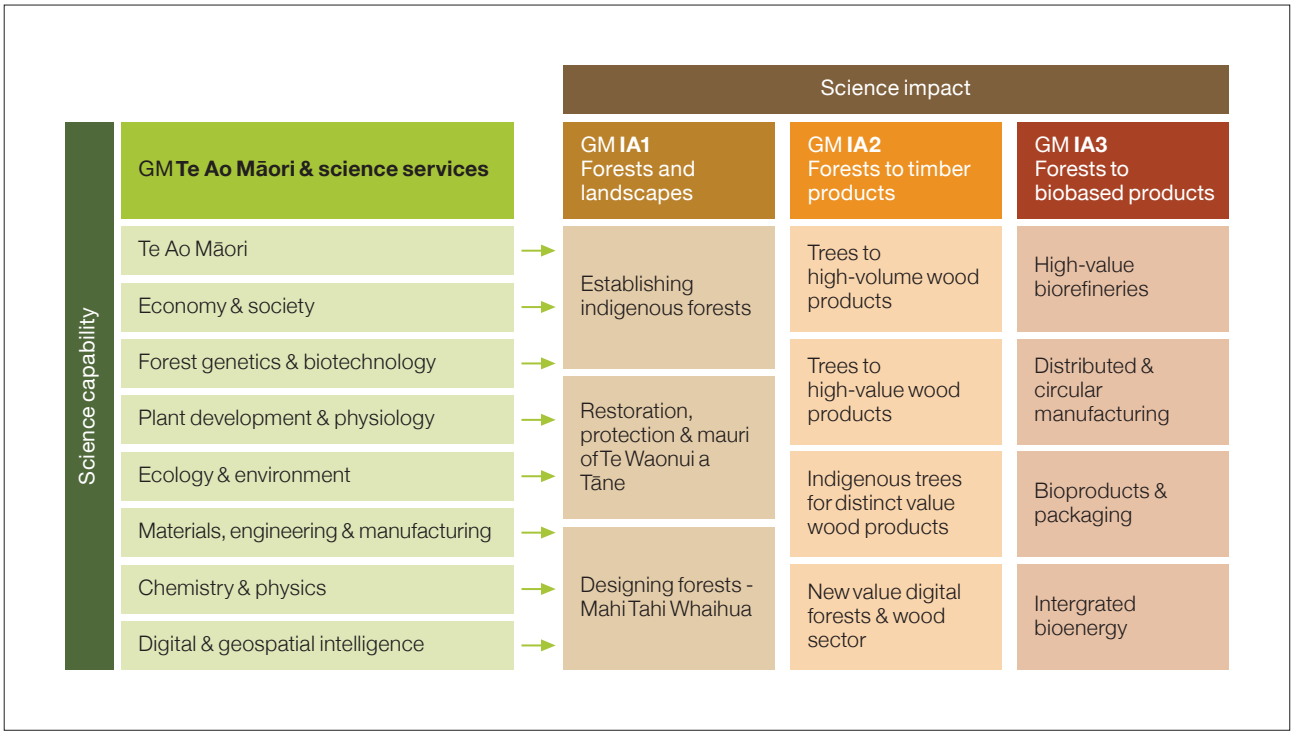

Figure 2: *Scion's science matrix model.*

Our science matrix model

To be more agile using our science capabilities to deliver across our three impact areas and 11 portfolios, Scion has moved to a matrix model (see Figure 2). This model went 'live' on 19 April 2021.

Programmes and projects to develop science and deliver impact under each of the 11 portfolios are coordinated by Portfolio Leaders.

All of our science capability resides in eight research groups reporting up through Research Group Leaders to the General Manager Te Ao Māori and Science Services. The Portfolio Leaders draw on this pool of science capability to resource the programmes and projects under the respective portfolios with project leaders and contributing scientists.

The General Manager Te Ao Māori and Science Services has responsibility for ensuring that Scion maintains a sustainable-level of scientific capability across the research groups to adequately resource the work of the portfolios and to ensure that we partner and collaborate to avoid duplicating existing resources. Where resource might not currently exist or is over-utilised the General Manager Te Ao Māori and Science Services might contract in needed capability.

It is expected that over time the make-up and mix of the research groups will change as the programmes and projects Scion is working on change. This will allow Scion to be more agile in responding to changing priorities and to more quickly take advantage of emerging opportunities.

Functions to support science and enable impact

The next stage of Scion's organisational realignment is to ensure that we have the right functional capability to more:

1. Efficiently support our science and scientists through project, operational and project-level finance management, bid support, modern and enabling IT and improved facilities and infrastructure;
2. More effectively enable impact through external stakeholder relationships with government (including to inform policy) and industry (including contract research and developing R&D partnerships), moving Scion technology through a commercialisation pipeline (supported by PSAF and investment funds), and external communications.

Strategic prioritisation framework

There will always be more science Scion wants to do than resource (funding, equipment, facilities and people) permits, so Scion continues to prioritise what it works on. We need to ensure that we are focusing our resources and investments in a way that is best aligned with New Zealand's future needs and recognise the opportunity to drive impact as it relates to our Statement of Core Purpose.

We use a robust process that considers multiple perspectives in a strategic assessment model to evaluate the fit of proposed research with Scion's strategy. The model contains six strategic drivers (see Appendix 2 for more detail on each driver):

- Capability
- Innovation/creativity
- Impact
- Contribution to Māori
- Great place to work
- Efficiency and effectiveness.

The entire process prioritises programmes of research by combining the strategic score with a top down look at whether they:

- are aligned to New Zealand's future needs,
- contribute to the Government's objectives,
- are critical to delivery of impact,
- are important to maintaining core capability,
- should only be carried out if someone will fund them, and
- are not well aligned with our strategy and should be wound down.

Financial sustainability

Scion continues to focus on building sustainable revenue sources to provide science and innovation of international standing, deliver on its core purpose outcomes and create impact.

Scion intends to continue efforts to secure funding for our research from the primary beneficiaries of that research. This is in line with the Government's draft *Research, science and innovation strategy*. In practice this means that Scion:

- Prioritises its SSIF funds towards strategic New Zealand benefit research. This includes research which is: (i) of public good (where a clear end user cannot easily be identified); (ii) is of benefit to an industry that does not yet exist in New Zealand; (iii) too risky or long-term to be funded by existing industry. It may also be leveraged to attract industry funding.
- Ensures contestable science funding, such as Endeavour Fund, is used to extend high-priority research beyond what is possible with SSIF funding rather than being the primary funding source for critical capability funding. Contestable funding may be used for novel research that clearly fits with our strategy while recognising that the research may not continue to be funded beyond the term of the contestable funding contract.
- Undertakes research where clear end users can be identified if those beneficiaries fund the research. Scion will look to apply this to both private sector beneficiaries as well as research that supports specific government operations (for example, biosecurity, fire research, carbon analysis for the Government's climate change reporting).

We recognise that we will need to actively shift our revenue sources to align with this strategy. In addition to the long-term funding solution being worked on with MBIE we are progressing discussions with existing industry on developing a more viable approach to funding their needs as beneficiaries.

Workforce relationships and development

Scion's greatest resource is its people. Ensuring we have the right people, doing the right things and enabling them to do their best work is critical to success.

Organisational realignment: We embarked on an organisational realignment last year to design a structure and network that supports delivery of Scion's strategic objectives. The realignment process for the science part of the business has concluded resulting in a new matrix structure. We are now focusing on the corporate and functional activities. A new structure with supporting processes and systems that best enable delivery of our Strategy 2030 will be rolled out in 2021/2022.

Workforce capacity and capability: Part of the organisation alignment and a feature of the matrix structure is to have better line of sight to future capability demand driven from our impact areas, which will allow more accurate identification of capability requirements within our research group structure.

Career pathways: An exciting feature of the organisational realignment is the development of a technologist career path for science staff. This focuses on applied science, with different metrics than the traditional h-index, to deliver impact for stakeholders.

Leadership and staff behaviour: We have engaged with an external training provider to deliver a year-long programme for all leaders within the new matrix structure including corporate and functional leaders. A key feature of this programme is general manager training in the material and coaching mechanisms for their direct reports. To support this programme, we have retired our historic pay-for-performance annual review approach and will implement a capability development system for all employees that focuses on career development.

Māori engagement: Within our research structure, a Te Ao Māori capability team supports mātauranga throughout our research programmes, cultural capability and critical relationships with Māori. Currently this is an incubator function within science capability, however, as the team's influence gathers critical mass, we envisage Māori cultural capability and relationship management to devolve across the entire organisation.

Safety and wellbeing of all workers: An external review of our health and safety systems and processes is underway in order to establishing a roadmap for continuous improvement activities over the coming years.

Facilities development

Creating the right environment for our work and staff remains important to Scion. This includes continuing to invest in world-class science equipment and facilities and information technology systems.

Our Rotorua campus, Te Papa Tipu Innovation Park, is undergoing a major redevelopment programme that will transform the campus into a modern, high-tech research facility. The Campus Master Plan encourages industry and science collaboration and co-innovation, makes efficient use of space and provides an improved interface with the public. New facilities are being designed to attract staff and foster great, innovative science.

Stage 1 completed last year with the construction of Te Whare Nui o Tuteata, our innovation hub. Designed using sustainable principles and showcasing timber technology Te Whare Nui o Tuteata is now the signature building on campus, encouraging collaboration and providing a welcoming gateway for industry and visitors alike.

Stage 2 commenced with new technology and expansion of our research nursery, which will be completed in 2022. Concept design is underway to replace our 50-year-old wood processing and biomaterial labs and workshops with facilities that enable us to continue delivering innovative science in a safe and healthy environment.

In addition to our own science facilities, Scion is leading the dialogue for a National Bioproduct Pilot Plant (BIOPILOT) to be based in Rotorua. Concept design will inform the level of investment required for such a facility in New Zealand.

Measuring our performance

Indicator name	Measure	Frequency	2019/2020 Actual	2020/2021 Target	2020/2021 Forecast	2021/2022 Target
End user collaboration	Revenue per FTE ($) from commercial sources	Quarterly	$63,197	$53,067	$70,307	$65,114
Research collaboration	Publications with collaborators	Quarterly	75	>100	70	75[1]
Technology and knowledge transfer excellence	Commercial reports per scientist FTE	Annually	2.03	>1.5	2.26	2.0
Science quality	Mean citation score	Annually	3.7	3.3	3.3	3.3
Financial indicator	Revenue per FTE	Quarterly	$180,796	$169,190	$188,436	$168,701
	Revenue per FTE – adjusted for COVID-19 recovery grant	Quarterly	$165,834	$156,541	$174,095	$168,701
Stakeholder engagement	Relevant partners (number and %) that have a high level of confidence that Scion sets research priorities relative to their industry	Annual	No survey undertaken due to COVID-19	>85%	79%[2]	>85%
	Percentage of stakeholders who have engaged with Scion about their strategic direction (new metric)	Annual	N/A	Establish benchmark	N/A	TBC improvement target on benchmark
	Relevant end-users (%) who are likely or very likely to recommend working with Scion	Annual	No survey undertaken due to COVID-19	>90%	94%[2]	>90%
	Māori partners relationships measure are "Very good" or "Improving" through customer survey (new metric)	Annual	N/A	Establish benchmark	N/A	TBC improvement target on benchmark
Māori economic development	Partnerships (number (n) and value ($)) established with Māori entities to support economic development through the forest industry	Quarterly	n = 15 $1.5m	n>10 >$1.5m	n = 15 $2m	n>15 $2m
Accelerated commercialisation	Technologies in Scion's pipeline (number and co-investment ($)); projects that progress to the business case stage (case studies)	Quarterly	17 and $327,438 2 cases	25 and $400,000 Cases ≥4	20 and $300,000 1 case	25 and $400,000 Cases ≥4
People and culture	Staff engagement	Annual	88%	>75%	70%	>75%
	Staff retention – staff turnover	Annual	12.3%	12%	7.4%	10%
	Health and safety – serious harm events	Annual	1[3]	0	0	0
	Staff diversity – % of permanent staff of Māori descent	Annual	11%	11%	9.5%	11%
	Gender neutral – pay equity (Median – total compensation unexplainable differences below <5%)	Annual	12.4%	<5%	11.8%	< 5%

[1] Aligned target to strategy and previous metric.
[2] Survey carried out in January 2021
[3] Notifiable incident: Back injury to US Dept of Forestry worker during rural fire work, reported to Worksafe NZ

Table 1: *Scion's performance monitoring scorecard indicators and measures.*

Our financials

1. Financial projections and performance

Scion's updated financial projections through to June 2024 are summarised in Table 2. Financial performance indicators are included in Table 5. Associated consolidated cash flow and balance sheet details are presented in Tables 3 and 4.

After adjusting for the COVID-19 funding support of $4.8 million Scion is budgeting for no revenue growth in 2021/22 followed by modest growth in the out years of 3 to 4 percent. This outlook is based on ongoing uncertainty relating to COVID-19 impacts and the contestable nature of a large portion of our revenue. There is limited risk in revenue in the 2021/22 financial year as a large proportion is contracted, however, there is less certainty in the subsequent years.

There is a reduction in Operating Profit (EBIT) in 2021/22 as the business invests in people capability to operationalise strategy and begin to identify improvements to internal processes. The year 2022/23 sees the shifting focus to making process improvements and implementing tools and systems to enable efficient delivery within the business. The uplift in EBIT in 2023/24 reflects the improvement given those changes.

Embedding our Strategy 2030 brings some disruption to the business, but this has been well managed to date as demonstrated by the strong result in the year to 30 June 2021.

Projected Income Statement				
	30/06/2021 $000 Forecast	30/06/2022 $000 Budget	30/06/2023 $000 Projection	30/06/2024 $000 Projection
Revenue				
Total revenue	62,938	57,829	59,564	61,947
Adjusted for COVID-19 recovery grant	58,148	57,829	59,564	61,947
Total operating expenditure	55,774	56,746	58,613	60,081
EBITDAF	12,364	6,690	7,042	8,309
Profit before tax	**6,944**	**1,013**	**871**	**1,781**
Profit after tax	**4,995**	**730**	**627**	**1,282**

Table 2: *Projected income statement for the three years ended 30 June 2022 to 2024.*

2. Cash position, balance sheet structure and dividends

As at 30 June 2021, Scion is forecasting end-of-year cash balances of $15.8 million. Given the investment planned (subject to business case and shareholder approval) in science equipment and wood engineering workshops and laboratories, this is projected to reduce to $6 million in June 2024. There is no provision in these projections for the development of a biopilot plant.

Projected Consolidated Statement of Cashflows				
	30/06/2021 $000 Forecast	30/06/2022 $000 Budget	30/06/2023 $000 Projection	30/06/2024 $000 Projection
Net cashflows from operations	11,458	5,048	7,084	7,856
Net cashflows from investing activities	(8,360)	(9,029)	(8,645)	(11,420)
Net cashflows from financing activities	(134)	(135)	(265)	(31)
Net increase (decrease) in cash	**2,964**	**(4,116)**	**(1,826)**	**(3,595)**
Opening cash balance	12,802	15,766	11,650	9,824
Closing cash balance	**15,766**	**11,650**	**9,824**	**6,229**

Table 3: *Projected consolidated statements of cashflows for the three years ended 30 June 2022 to 2024.*

Projected Consolidated Balance Sheet				
	30/06/2021 $000 Forecast	30/06/2022 $000 Budget	30/06/2023 $000 Projection	30/06/2024 $000 Projection
Total assets	70,340	69,207	69,757	71,075
Projected closing shareholders' funds	53,175	53,905	54,532	55,814
Shareholders' funds to total assets	**0.76**	**0.78**	**0.78**	**0.79**

Table 4: *Projected consolidated balance sheet as at 30 June 2021, 2022, 2023 and 2024.*

Financial performance targets

	Forecast 2021	Budget 2022	Projection 2023	Projection 2024
Efficiency				
Operating margin	19.6%	11.6%	11.8%	13.4%
Operating margin per FTE	$37,019	$19,516	$20,542	$24,670
Risk				
Quick ratio	2.11:1	2.02:1	1.79:1	1.37:1
Profit volatility	34.3%	33.8%	33.0%	28.3%
Forecasting risk	4.3%	3.9%	3.7%	3.7%
Growth/investment				
Adjusted return on equity	9.9%	1.4%	1.2%	2.3%
Revenue growth (adjusted for COVID-19 recovery grant)	9.7%	(0.5)%	3.0%	4.0%
Capital renewal	1.5x	1.6x	1.4x	1.7x

Table 5: *Financial performance targets for the three years ended 30 June 2022 to 2024.*

Appendix 1: Accounting policies

1. Statement of accounting policies

Reporting entity

New Zealand Forest Research Institute Limited is a Crown Research Institute registered under the Companies Act 1993. The registered office is Te Papa Tipu Innovation Park, 49 Sala Street, Rotorua. The consolidated financial statements consist of New Zealand Forest Research Institute Limited and its subsidiaries (the Group). The Consolidated Financial Statements of New Zealand Forest Research Institute Limited for the year were authorised for issue in accordance with a resolution of the directors on the date as set out on the Consolidated Statement of Financial Position.

New Zealand Forest Research Institute Limited (the Company) is domiciled and incorporated in New Zealand and is wholly owned by the Crown.

The activities of New Zealand Forest Research Institute Limited include a range of research and development programmes aimed at using plant-based renewable resources and waste streams to create new materials, energy sources and environmentally sustainable products and processes.

New Zealand Forest Research Institute Limited trades as Scion and these names have identical meaning in this report.

1.1 Summary of significant accounting policies

a) ***Basis of preparation.*** The consolidated financial statements have been prepared in accordance with generally accepted accounting practice in New Zealand (NZ GAAP) and the requirements of the Companies Act 1993, the Financial Reporting Act 2013, the Public Finance Act 1989, the Crown Entities Act 2004 and the Crown Research Institutes Act 1992. The consolidated financial statements have also been prepared on a historical cost basis, except for forestry assets, carbon credits and certain heritage assets that have been measured at fair value.

The consolidated financial statements are presented in New Zealand dollars and all values are rounded to the nearest thousand dollars ($000).

b) ***Statement of compliance.*** The consolidated financial statements have been prepared in accordance with NZ GAAP. For the purpose of complying with NZ GAAP, the Group is a for profit entity. They comply with New Zealand equivalents to International Financial Reporting Standards, and other applicable Financial Reporting Standards, as appropriate for profit-oriented entities. The consolidated financial statements comply with International Financial Reporting Standards (IFRS).

c) ***Basis of consolidation.*** The consolidated financial statements comprise the financial statements of the Company and its subsidiaries as at 30 June. Control is achieved when the Group is exposed, or has rights, to variable returns from its involvement with the investee and has the ability to affect those returns through its power over the investee. Specifically, the Group controls an investee if and only if the Group has:
- Power over the investee (i.e. existing rights that give it the current ability to direct the relevant activities of the investee);
- Exposure, or rights, to variable returns from its involvement with the investee, and
- The ability to use its power over the investee to affect its returns.

When the Group has less than a majority of the voting or similar rights of an investee, the Group considers all relevant facts and circumstances in assessing whether it has power over an investee, including:
- The contractual arrangement with the other vote holders of the investee;
- Rights arising from other contractual arrangements;
- The Group's voting rights and potential voting rights.

The Group re-assesses whether or not it controls an investee if facts and circumstances indicate that there are changes to one or more of the three elements of control. Consolidation of a subsidiary begins when the Group obtains control over the subsidiary and ceases when the Group loses control of the subsidiary. Assets, liabilities, income and expenses of a subsidiary acquired or disposed of during the year are included in the statement of comprehensive income from the date the Group gains control until the date the Group ceases to control the subsidiary.

All intra-group assets and liabilities, equity, income, expenses and cash flows relating to transactions between members of the Group are eliminated in full on consolidation.

A change in the ownership interest of a subsidiary, without a loss of control, is accounted for as an equity transaction. If the Group loses control over a subsidiary, it:
- Derecognises the assets (including goodwill) and liabilities of the subsidiary;
- Derecognises the carrying amount of any non-controlling interests;
- Derecognises the cumulative translation differences recorded in equity;

- Recognises the fair value of the consideration received;
- Recognises the fair value of any investment retained;
- Recognises any surplus or deficit in profit or loss;
- Reclassifies the Group's share of components previously recognised in OCI to profit or loss or retained earnings, as appropriate, as would be required if the Group had directly disposed of the related assets or liabilities.

d) Associate companies. The Group's investment in its associates is accounted for using the equity method of accounting in the consolidated financial statements. The associates are entities over which the Group has significant influence and that are neither subsidiaries nor joint ventures.

The Group deems it has significant influence if it has over 20% of the voting rights.

The reporting dates of the associates and subsidiaries, and the Company, are identical, and the associates' accounting policies conform to those used by the Company for like transactions and events in similar circumstances.

Associate companies have been reflected in the consolidated financial statements on an equity accounting basis which shows the Group's share of profit in the Consolidated Statement of Comprehensive Income and its share of post-acquisition increases or decreases in net assets, in the Consolidated Statement of Financial Position.

e) Intangible assets. Intangible assets acquired separately are capitalised at cost and those acquired from a business combination are capitalised at fair value as at the date of acquisition. Following initial recognition, the cost model is applied to the class of intangible assets.

The useful lives of these intangible assets are assessed to be either finite or indefinite.

Where amortisation is charged on assets with finite lives, this expense is recognised in profit and loss.

Intangible assets created within the business are not capitalised and expenditure is charged to profit and loss in the year in which the expenditure is incurred.

Intangible assets are tested for impairment where an indicator of impairment exists, and in the case of indefinite life intangibles, annually, either individually or at the cash generating unit level. Useful lives are also examined on an annual basis and adjustments, where applicable, are made on a prospective basis.

A summary of the policies applied to the Group's capitalised intangible assets is as follows:

	Software
Useful lives	Finite
Method used	4 years – straight line
Type	Acquired
Impairment test/ Recoverable amount testing	Amortisation method reviewed at each financial year-end. Reviewed annually for indicators of impairment

Gains or losses arising from derecognition of an intangible asset are measured as the difference between the net disposal proceeds and the carrying amount of the asset and are recognised in the profit and loss when derecognised.

Carbon Credits. New Zealand emission reduction units (NZUs) are recognised when the Group controls the units, provided that it is probable that economic benefits will flow to the Group and the fair value of the units can be measured reliably. Control of the NZUs arises when the Group is entitled to claim the NZUs from the government.

NZUs are initially measured at fair value on entitlement as an intangible asset unless the Board of Directors has determined they are held for sale, in which case they would be recorded at fair value as inventory.

Following initial recognition, the intangible asset is measured at fair value when the Board considers there is an active market for the sale of NZUs. NZUs determined as held for sale at recognition and recorded as inventory, are subsequently measured at the lower of cost and net realisable value.

The liability arising from the deforestation of eligible land is measured using the market value approach. A liability exists and is recognised on pre-1990 forests if the land use changes from forestry.

f) Biological assets. Biological assets consist entirely of tree plantations which are measured at fair value less any point of sale costs. Gains and losses arising on initial recognition or change in fair value, less estimated point of sale costs, are included in profit and loss in the period in which they arise.

The fair value of tree plantations is determined by an independent valuer.

The valuation method for immature trees is the net

present value of future net harvest revenue less estimated costs of owning, protecting, tending and managing trees. For mature trees, fair value is deemed to be the net harvest revenue value.

g) ***Property, plant and equipment.*** All items of property, plant and equipment are initially recorded at cost, where relevant on purchase from the Crown as at 1 July 1992, adjusted for subsequent additions at cost, disposals, depreciation and impairment. Plant and equipment are recorded at cost less accumulated depreciation less accumulated impairment losses (if any). Land and capital work in progress are recorded at cost. Some library books have been identified as heritage assets and are recorded at fair value as determined by an independent valuer. Valuations are obtained every five years or more often where circumstances indicate that a significant change in fair value has occurred.

Expenditure incurred on property, plant and equipment is capitalised where such expenditure will increase or enhance the future benefits provided by the asset. Expenditure incurred to maintain future benefits is classified as repairs and maintenance.

When an item of property, plant and equipment is disposed of the difference between the net disposal proceeds and the carrying amount is recognised as a gain, or loss, in profit and loss.

Depreciation is provided for using the straight-line method to allocate the historical cost, less an estimated residual value, over the estimated useful life of the asset.

The useful lives of the major classes of assets have been calculated as follows:

Buildings and land improvements	20 - 60 years
Plant and equipment	3 - 20 years
Furniture and fittings	10 - 20 years
Motor vehicles	3 - 7 years
Library books and periodicals	20 years or longer

h) ***Recoverable amount of non-current assets.*** At each reporting date, the Group assesses whether there is any indication a non-financial asset (except for biological assets and inventory) may be impaired. Where an indicator of impairment exists, the Group makes a formal estimate of recoverable amount. Where the carrying amount of an asset exceeds its recoverable amount the asset is considered impaired and is written down to its recoverable amount.

Recoverable amount is the greater of fair value less costs to sell and value in use. It is determined for an individual asset, however, if the asset's value in use cannot be estimated to be close to its fair value less costs to sell, and it does not generate cash inflows that are largely independent of those from other assets or groups of assets, it is determined for the cash-generating unit to which the asset belongs.

In assessing value in use, the estimated future cash flows are discounted to their present value using a pre-tax discount rate that reflects current market assessments of the time value of money and the risks specific to the asset.

i) ***Trade receivables.*** Trade receivables are classified as financial assets at amortised costs. Trade receivables are initially recognised at fair value and subsequently valued at amortised cost less impairment allowance.

The Group applies a simplified approach in calculating expected credit losses (ECLs) for trade receivables, i.e. a loss allowance for trade receivables is based on lifetime ECLs at each reporting date. The group has established a provision matrix that is based on its historical credit loss experience, adjusted for forward-looking factors specific to the debtors and the economic environment. The provision rates are based on days due for grouping of various customer segments with similar loss patterns. The calculation reflects the probability-weighted outcome, the time value of money and reasonable and supportable information that is available at the reporting date about past events, current conditions and forecasts of future economic conditions.

j) ***Inventories.*** Consumable stores are valued at the lower of cost, on a weighted average price of stock on hand, and net realisable value.

Nursery stocks are valued at lower of cost or net realisable value. Changes in net realisable value are recognised in the profit and loss account in the period in which they occur.

k) ***Research costs.*** Research costs are expensed in the period incurred.

l) ***Provisions.*** Provisions are recognised when the Group has a present obligation (legal or constructive) as a result of a past event, it is probable that an outflow of resources embodying economic benefits will be required to settle the obligation and a reliable estimate can be made of the amount of the obligation.

Provisions are measured at the present value of management's best estimate of the expenditure required to settle the present obligation at the Consolidated Statement of Financial Position date using a discounted cash flow methodology.

m) Employee benefits.

(i) Wages, salaries and annual leave. The liability for wages, salaries and annual leave recognised in the Consolidated Statement of Financial Position is the amount expected to be paid at balance date. Provision has been made for benefits accruing to employees for annual leave in accordance with the provisions of employment contracts in place at balance date.

(ii) Long service leave. The liability for long service leave is recognised and measured as the present value of expected future payments to be made in respect of services provided by employees up to the reporting date using the projected unit credit method. Consideration is given to expected future wage and salary levels, experience of employee departures, and periods of service. Expected future payments are discounted using market yields at the reporting date on national government bonds with terms to maturity and currencies that match, as closely as possible, the estimated future cash outflows.

(iii) Defined benefit plan. The defined benefit plan is unfunded. The cost of providing benefits under the defined benefit plan is determined using the projected unit credit actuarial valuation method. Actuarial gains and losses are recognised through other comprehensive income in the period in which they arise.

The defined benefit liability recognised in the Consolidated Statement of Financial Position represents the present value of the defined benefit obligations.

Long service leave and defined benefit plan provisions are based on an actuarial valuation.

n) Leases. The Group assesses at contract inception whether a contract is, or contains, a lease. That is, if the contract conveys the right to control the use of an identified asset for a period of time in exchange for consideration.

Group as a lessee. The Group applies a single recognition and measurement approach for all leases, except for short-term leases and leases of low-value assets. The Group recognises lease liabilities to make lease payments and right-of-use assets representing the right to use the underlying assets.

(i) Right-of-use assets. The Group recognises right-of-use assets at the commencement date of the lease (i.e., the date the underlying asset is available for use). Right-of-use assets are measured at cost, less any accumulated depreciation and impairment losses, and adjusted for any remeasurement of lease liabilities. The cost of right-of-use assets includes the amount of lease liabilities recognised, initial direct costs incurred, and lease payments made at or before the commencement date less any lease incentives received. Right-of-use assets are depreciated on a straight-line basis over the shorter of the lease term and the estimated useful lives of the assets, as follows:

Building	3 - 6 years
Forestry rights	70 years

(ii) Lease liabilities. At the commencement date of the lease, the Group recognises lease liabilities measured at the present value of lease payments to be made over the lease term. The lease payments include fixed payments (including in-substance fixed payments) less any lease incentives receivable, variable lease payments that depend on an index or a rate, and amounts expected to be paid under residual value guarantees. The lease payments also include the exercise price of a purchase option reasonably certain to be exercised by the Group and payments of penalties for terminating the lease, if the lease term reflects the Group exercising the option to terminate.

Variable lease payments that do not depend on an index or a rate are recognised as expenses (unless they are incurred to produce inventories) in the period in which the event or condition that triggers the payment occurs.

In calculating the present value of lease payments, the Group uses its incremental borrowing rate at the lease commencement date because the interest rate implicit in the lease is not readily determinable. After the commencement date, the amount of lease liabilities is increased to reflect the accretion of interest and reduced for the lease payments made. In addition, the carrying amount of lease liabilities is remeasured if there is a modification, a change in the lease term, a change in the lease payments (e.g. changes to future payments resulting from a change in an index or

rate used to determine such lease payments) or a change in the assessment of an option to purchase the underlying asset.

(iii) Short-term leases and leases of low-value assets. The Group applies the short-term lease recognition exemption to its short-term leases of temporary buildings (i.e. those leases that have a lease term of 12 months or less from the commencement date and do not contain a purchase option). It also applies the lease of low-value assets recognition exemption to leases of office equipment that are considered to be low value. Lease payments on short-term leases and leases of low-value assets are recognised as an expense on a straight-line basis over the lease term.

Group as a lessor. Leases in which the Group retains substantially all the risks and benefits of ownership of the leased asset are classified as operating leases.

o) Cash and cash equivalents. Cash and short-term deposits in the Consolidated Statement of Financial Position comprise cash at bank and in-hand and short-term deposits with an original maturity of three months or less.

For the purposes of the Consolidated Statement of Cash Flows, cash and cash equivalents consist of cash and cash equivalents as defined above, net of outstanding bank overdrafts.

p) Goods and Services Tax (GST). All items in the financial statements are stated net of GST, with the exception of trade receivables and payables, which are inclusive of GST invoiced.

q) Foreign currencies.
Functional and presentation currency. Both the functional and presentation currency of New Zealand Forest Research Institute Limited and its subsidiaries is New Zealand dollars.

Transactions and balances. Transactions in foreign currencies are initially recorded in the functional currency by applying the exchange rates ruling at the date of the transaction. Monetary assets and liabilities denominated in foreign currencies are retranslated at the rate of exchange ruling at the Consolidated Statement of Financial Position date.

Non-monetary items that are measured in terms of historical cost in a foreign currency are translated using the exchange rate as at the date of the initial transaction. Non-monetary items measured at fair value in a foreign currency are translated using the exchange rates at the date when the fair value was determined.

r) Revenue recognition.

Revenue from contracts with customers.

Research revenue. Research revenue from both government and commercial sources (except for government grants) is recognised over time using an input method to measure progress toward complete satisfaction of the service, because the Group's performance does not create an asset with an alternative use and the Group has an enforceable right to payment for performance completed to date. Revenue is recognised by reference to costs incurred to date and other contracted commitments. Work completed but not invoiced is recorded as accrued revenue while work invoiced but not completed is recorded as revenue in advance.

Government revenue under research revenue includes non-devolved revenue received from the Ministry of Business, Innovation and Employment in the form of Endeavour Funding, and Preseed Accelerator Fund programmes.

Sale of goods and rendering services (Fee for services). Revenue from work programmes under Commercial Testing Services and Nursery crops is recognised at the point of time when control is transferred to the customer, generally on dispatch of crops to the customer or when service is completed.

Other revenue

Government Grants. Government Grants includes devolved revenue from the Ministry of Business, Innovation and Employment in the form of Strategic Science Investment Funding and COVID-19 Recovery Funding. Government Grant revenue has only been recognised after all appropriate conditions have been met.

Rent revenue. Rent revenue is recognised on a straight line basis over the lease term.

Interest revenue. Interest revenue is recognised when earned based on applicable interest rates applied to the Group's cash deposit balances.

s) Taxation. The income tax expense charged to the profit and loss includes both the current year's provision and the income tax effects of temporary differences calculated using the liability method. Current income tax relating to items recognised directly in equity is recognised in equity and not in profit or loss.

Tax effect accounting is applied on a comprehensive basis to all temporary differences. A debit balance in the deferred tax account, arising from temporary differences or income tax benefits from income tax losses, is only recognised if it is probable there will be taxable profits available in the future against which the deferred tax asset can be utilised.

Subsequent realisation of the tax benefit is subject to the requirements of income tax legislation being met.

t) Borrowing costs. Borrowing costs are recognised as an expense when incurred except for those borrowing costs determined as directly attributable to the acquisition, construction or production of a qualifying asset (i.e. an asset that necessarily takes a substantial period of time to get ready for its intended use or sale).

u) Interest-bearing loans and borrowings. All loans and borrowings are classified as financial liabilities at amortised costs. They are initially recognised at the fair value of the consideration received net of issue costs associated with the borrowing.

After initial recognition, interest-bearing loans and borrowings are subsequently measured at amortised cost using the effective interest method. Amortised cost is calculated by taking into account any issue costs, and any discount or premium on settlement.

For the purpose of valuing bank borrowings, the bank interest rate is taken as the discount rate. As such the bank borrowings are carried at the value of the debt with the bank.

v) Trade and other payables. Trade and other payables are classified as financial liabilities at amortised costs. They are carried at amortised cost and due to their short term nature they are not discounted. They represent liabilities for goods and services provided to the Group prior to the end of the financial year that are unpaid and arise when the Group becomes obliged to make future payments in respect of the purchase of these goods and services. The amounts are unsecured and are usually paid within 60 days of recognition.

1.2 Significant accounting judgements, estimates and assumptions

The preparation of the Group's consolidated financial statements requires management to make judgements, estimates and assumptions that effect the reported amounts of revenue, expenses, assets and liabilities, and the accompanying disclosures.

a) Revenue recognition from contracts with customers. Revenue is predominately recognised based on the percentage of work completed on a project basis over time. Percentage of work completed is based on costs incurred from inception of the project as a percentage of total forecasted project costs. Management judgement is required in estimating total forecasted costs which impacts the revenue recognised (Note 2*), the revenue in advance (Note 8*) and accrued revenue (Note 17*).

In determining if a customer contract can be recognised over time, management has considered its right to receive payment for work done up to the point of any termination of contract. In the absence of a termination clause management has assessed that the Group has a clear right to be paid for work completed up to the point of termination.

b) Heritage assets. The Group holds several heritage assets which have significant value due to being both rare, and having importance to the nation. Where a heritage cost can be measured reliably they are revalued at least every five years and included as part of property plant and equipment.

The increase/decrease in value is recognised in the Consolidated Statement of Financial Position through other comprehensive income.

Due to the nature of some heritage assets, management does not believe they can be valued reliably. These assets have been identified and disclosed. Details of heritage assets can be found in Note 11* and Note 22*.

c) Biological assets. The Group's biological assets consist of tree plantations. These are valued at the net present value of future net harvest revenue less estimated costs of owning, protecting, tending and managing trees. The valuation process includes several judgements and estimations around discount rates, future costs, and future prices. Management used the experience of a registered forestry valuer to reduce the risk of misstatement resulting from these judgements and estimates.

d) Defined benefit scheme. The Group operates an unfunded defined benefit plan. Significant assumptions used to value the plan liability include the discount rate and future salary increases as set out in the notes* to the financial statements. Management used the experience of a registered actuary to reduce the risk of misstatement resulting from these judgements and estimates.

*Notes are available in Scion's Annual Report 2020 Reports and Financial Statements pages 22-46
https://www.scionresearch.com./?a=75657

Appendix 2 – Scion's strategic prioritisation model

The strategy score model component of our strategic prioritisation process contains six strategic drivers detailed below. Proposed programmes and projects will be scored against each driver (using a weighted spreadsheet model) to determine a relative priority.

Driver	**Capability**
Rationale	Matching the right and best people to the research needed to deliver on Scion's Strategy 2030 will help ensure Scion is able to deliver excellent and relevant science that has meaningful impact.
Driver description	We will ensure that Scion is at the forefront of science and innovation by focusing our activity in areas that are critical for the delivery of Scion's strategy or that support national capability. New activity should advance capability through targeted investment in people and infrastructure to ensure that we enhance our ability with others to deliver on our strategy.

Driver	**Innovation/creativity**
Rationale	Scion's Strategy 2030 aims to enable a new and better future for New Zealand using trees and other biomaterials. Such progress will only be achieved if our science is innovative and excellent.
Driver description	Ensure our vision is enabled and progressed through creativity, agility in Scion's key themes and impact areas. Lead New Zealand at the frontier of science relating to a circular bioeconomy through demonstrated excellence in science and invention. Demonstrate connectedness through global and local collaboration with others to avoid reinvention and gain access to complementary skills.

Driver	**Impact**
Rationale	Our science is of most use if it makes a difference and brings benefit to New Zealand. This is a key part of our (and all CRIs') core purpose. We take a deliberately broad view of benefit and impact to help ensure New Zealand can capture the full value of the research we do, particularly in the support of the recovery from COVID-19 and the building of a better future.
Driver description	Create impact for New Zealand that is measured by economic, social and environmental impact, through our policy or strategy advice, and/or technology transfer through partners and our science. Demonstrate the value Scion has achieved to a variety of audiences, including iwi, industry, government, public or international partners.

Driver	**Contribution to Māori**
Rationale	Māori are tangata whenua in Aotearoa and at Te Papa Tipu Innovation Park. They have cultural and spiritual connections to the land and environment. They are major forestry owners. Success in everything we do requires working with Māori.
Driver description	To enhance Māori futures through their unique resources, ensuring we create opportunities by building enduring Māori partnerships and driving co-innovations, using a Māori lens.

Driver	**Great place to work**
Rationale	Our staff will deliver great research and impact if they are engaged and satisfied at work.
Driver description	Enabling positive employment experience through practical and value-adding solutions that align with Scion's strategic direction and organisational imperatives.

Driver	**Efficiency and effectiveness**
Rationale	Scion, like all organisations, has finite human and financial resources. Being focused and making the best use of those resources ensures we can deliver maximum benefit for New Zealand.
Driver description	Create a more effective organisation through improvements in processes, systems and infrastructure, while anticipating future organisational direction and consideration of best practice approaches, to deliver ongoing efficiencies.

Appendix 3: Other matters required by the CRI Act 1992

Information to be reported to shareholders

Scion will provide information that meets the requirements of the:

- Crown Research Institutes Act 1992 (the Act);
- Companies Act 1993;
- Financial Reporting Act 1993;
- Crown Entities Act 2004; and
- New Zealand Institute of Chartered Accountants (NZICA) with regards to Generally Accepted Accounting Practice (GAAP).

The following information is made available to enable our shareholders to make an informed assessment of Scion's performance:

- A Statement of Corporate Intent (SCI) which sets out Scion's strategy for delivering against its core purpose and the company's financial and non-financial performance targets. The draft SCI is due not later than one month before the start of the financial year (31 May).
- An Annual Report containing sufficient information to allow an informed assessment to be made against the performance targets in the SCI. This report includes comments on our core business and how we communicate our science, financial statements (including audit report), and a report from the Directors to the shareholders. The Annual Report is to be provided within three months of the financial year ended 30 June. A public Annual General Meeting is to be held no later than six months after balance date and not later than 15 months after the previous AGM.
- A Half-Yearly Report containing unaudited financial statements (including comparatives of the same period in the previous year) and major highlights during the period. The Half-Yearly Report is due within two months of the first half of each financial year ended 31 December.
- A Quarterly Report containing information such as unaudited financial statements (including current quarter and year-to-date budgets and a forecast for the financial year ended 30 June). The Quarterly Report also includes financial performance measures and progress towards meeting non-financial performance targets. The Quarterly Report is currently requested within one month of each financial quarter ended 30 September, 31 December, 31 March, and 30 June.
- Any other information relating to the affairs of the company, as reasonably required by shareholders, under section 20 of the Act and section 45B of the Public Finance Act 1989.

Accounting policies

Scion adopts generally accepted accounting practice in New Zealand as prescribed by the External Reporting Board. The accounting policies for the measurement and reporting of financial performance, movements in equity, financial position, and cash flows are detailed in Scion's Annual Reports available at www.scionresearch.com

Dividend policy

In determining the amount of ongoing dividend (if any) recommended to be distributed to the Shareholders, consideration will be given to:

- providing for capital investment requirements and consideration as to whether there is a need for capital injection from Shareholders;
- Scion's working capital requirements;
- the ongoing financial viability of Scion, including the ability to repay debt;
- the need to comply with Bank Covenants;
- the obligations of the directors under the Companies Act 1993 and other statutory requirements;
- resilience against fluctuations in the demand for Scion's services;
- the need to ensure the maintenance of scientific capability through the provision of scientific technology, equipment and science capability building.

Any dividend would be paid within three months of the financial year-end.

Activities where shareholder compensation would be required

The Board would look to seek compensation from the shareholders in the following circumstances:

- Where the shareholders instruct Scion to undertake activities or assume obligations that would result in a reduction of the company's profit or net realisable value.
- Where the Board may consider undertaking strategic investments for the wider benefit of the New Zealand public, involving financial outlays beyond those incorporated within the company's Statement of Corporate Intent or financing capabilities.

  No request for compensation is currently being sought from the shareholders. At this time no such investment has been identified, nor have any financial projections for such investment been included in Scion's 2021-2024 Statement of Corporate Intent.

Other matters specifically requested by the shareholder

There are no other matters that have been specifically requested by the shareholders.

Significant transactions policy

As required by section 13(1)(d) of the Crown Research Institutes Act 1992, neither Scion nor its subsidiaries will acquire:

- shares that give it substantial influence in or over a company; or
- an interest in any partnership, joint venture, or other association of persons, or an interest in a company other than in its shares; or
- settle, or be or appoint a trustee of, a trust except after written notice to the shareholding Ministers.

The Board will obtain prior written consent from Shareholding Ministers for any transaction or series of transactions involving a full or partial acquisition, disposal or modification of property (buildings, land, and capital equipment) and other assets with a value equivalent to or greater than $10 millon.

The Board will obtain prior written consent for any transaction or series of transactions with a value equivalent to or greater than $5 million involving:

- the acquisition or disposal, in full or in part, of shares or interests in a subsidiary, external company or business unit;
- transactions that affect a company's ownership of a subsidiary or a subsidiary's ownership of another entity (provided that transactions which include "drag-along" clauses that compel Scion to sell interests at a future date at the direction of the investors shall be valued at the time of the investment transaction);
- other transactions that fall outside the scope of the definition of the company's core business or that may have a material effect on the company's science capabilities.

The Board will advise Shareholding Ministers in writing before entering into any transaction related to property and commercialisation activities below this threshold in accordance with notice requirements agreed between the Ministers and Scion from time to time.

Commercial value of the shareholders' investment

Section 16(3) of the Act requires the Scion Group to furnish an estimate of the current commercial value of the Crown's investment. The Scion Board is satisfied that the net asset position (or shareholders' funds) as at 30 June 2020 is a fair and reasonable indication of the commercial value of the Group. The net asset position as shown in accordance with the company's accounting policies for 30 June 2020 was $48.2 million.

Science working for New Zealand

The Crown Research Institutes (CRIs) proudly work, individually and collectively, to create a more prosperous, sustainable and innovative New Zealand

agresearch
āta mātai, mātai whetū

ESR
Science for Communities

GNS SCIENCE
TE PŪ AO

Manaaki Whenua
Landcare Research

NIWA
Taihoro Nukurangi

Plant & Food™ Research
Rangahau Ahumāra Kai

SCION™
FORESTS ▪ PRODUCTS ▪ INNOVATION

www.sciencenewzealand.org

3,800	54	6,000	40
SMART AND PASSIONATE PEOPLE	SITES ACROSS NEW ZEALAND	SCIENCE PROJECTS EACH YEAR	NATIONALLY SIGNIFICANT DATABASES & COLLECTIONS


scion
FORESTS PRODUCTS INNOVATION