



FIGHT FOOD WASTE CRC

Strategic Plan 2018-2028



FIGHT FOOD WASTE
Cooperative Research Centre

REDUCE - TRANSFORM - ENGAGE



Australian Government
Department of Industry,
Innovation and Science

Business
Cooperative Research
Centres Program

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Chair's Statement

As Chair, I felt great pride in helping to deliver the successful bid for the \$120 million Fight Food Waste Cooperative Research Centre (CRC) in 2017/2018 in collaboration with the bid team, the Industry Advisory Committee and our wonderful participants.

Our success was announced in April 2018, and since then there has been much work to do to realise the expectations of our 50 industry and 10 research participants.

In committing to the Fight Food Waste CRC, these participants invested their time and money to develop an initial research portfolio of 30 projects that will REDUCE food waste across the supply chain, TRANSFORM unavoidable waste into innovative products, and ENGAGE with industry and consumers to deliver behavioural change.



My role now is to drive the Fight Food Waste CRC to deliver its research portfolio through high quality research projects that are based on the best science and that deliver real world solutions to industry.

As a Board, we have defined the values that will underpin this 10-year journey of the Fight Food Waste CRC.

The Fight Food Waste CRC 2018-2028 Strategic Plan provides the roadmap for the strategic direction and investment priorities for the life of the Fight Food Waste CRC.

All research and development projects funded through the Fight Food Waste CRC must have a real impact on food waste reduction and in generating a commercial outcome from the Fight Food Waste CRC activity.

In order to monitor this, we will capture the baseline of food waste in each of our projects and measure the real impact throughout the project and at the end.

We are committed to delivering this plan to ensure thriving, efficient and sustainable food production and consumption in Australia remains central to our economy, regional job security and prosperity.

A handwritten signature in black ink that reads "J Webster". The signature is written in a cursive, slightly slanted style.

John Webster
BEc, GAICD

CEO's Statement

As a research and development organisation, we have set an ambitious vision to realise an Australia without food waste.

We aim to achieve this through working collaboratively with our current and future industry participants, the Australian Government, Food Innovation Australia Ltd (FIAL), and state and territory governments. Additionally, we aim to learn from our leading international collaborators in Wageningen University & Research in the Netherlands and the Waste & Resource Action Programme in the United Kingdom. It is only through collaboration that such a daring goal can be achieved.

Our success will not be limited to what we undertook to deliver in our Full Business Case submitted to the Australian Government CRC Program in December 2017. We will be an open CRC that seeks new opportunities and new partners to over-deliver for our participants and the Australian Government Department of Industry, Innovation and Science CRC Program.

It has been a six-year journey of discovery and delivery that has led me to the position of being the inaugural Chief Executive Officer of the Fight Food Waste CRC. It is a responsibility I revel in and one that I look forward to exceeding expectations in. To me, success over our 10-year journey will look like:

- a well-managed RD&E program that has a demonstrated benefit for industry/participants as well as on reducing, repurposing and transforming food waste in Australia.
- a program that new industry participants want to join in order to identify and fight food waste at every step of the supply chain.

- delivering a significant contribution towards Australia's commitment to Sustainable Development Goal 12 of Sustainable Production and Consumption, Target 3 – 50% food waste reduction by 2030 - as well as contributing to Goal 2 of Zero Hunger, Goal 9 of Industry, Innovation and Infrastructure, Goal 11 of Sustainable Cities and Communities, Goal 13 of Climate Action and Goal 15 of Life on Land.



My commitment to participants is that we will increase industry profitability, address food insecurity and enhance Australia's reputation as a sustainable food producer, which is where my journey started in 2013.

A handwritten signature in black ink, appearing to read 'S Lapidge'.

Dr Steven Lapidge

BSc(Hons), PhD, MBA, GAICD, MAIFST

Executive Summary

The Fight Food Waste CRC aims to address the growing international problem of food waste, both here in Australia as well as to contribute to global knowledge and action.

Globally 32% of food produced for human consumption, more than 1.3 billion tonnes, is lost in agriculture and the supply chain (16%) or wasted by consumers (16%) at an estimated cost of \$1.75 trillion p.a.¹

Food waste was estimated to total \$20 billion per annum in Australia in 2015. In November 2017 the Australian Government released the National Food Waste Strategy (NFWS) that committed Australia to Sustainable Development Goal 12.3, to halve Australia's food waste by 2030.

The Fight Food Waste CRC commenced in July 2018 with a \$30 million grant from the Australian Government Department of Industry, Innovation and Science CRC Program to match the \$33 million in cash and \$57 million in in-kind funding raised by the 60 participants. The funding was based on the 10-year Full Business Case that aligned with the 2016 Food and Agribusiness Sector Competitiveness Plan prepared by FIAL.

The following strategy sets out our 10-year plan to not only deliver the Full Business Case - now the basis of the Grant Agreement with the Australian Government Department of Industry, Innovation and Science - but also significantly contribute to the NFWS and achieving SDG 12.3 by 2030. We plan to do this through two key actions:

- deliver on the Grant Agreement – We will first establish our initial 30-project research, development and extension program based on the best science and expertise with our existing participants. We will then develop and deliver new projects with existing and new participants that ensures we effectively deliver on all Grant Agreement performance milestones.
- deliver Future Initiatives – We will identify and target additional food loss and waste opportunities based on the National Food Waste Baseline (NFWB) and other key reports that will deliver significant food waste reduction and industry benefits to help achieve SDG 12.3. Additionally, we will scope and potentially develop a 10-year national behaviour change program that targets the entire food system particularly consumers, with the Australian and state and territory governments and industry that reduces and prevents food waste from entering landfill. Future initiatives will require additional funding to deliver.

This 10-year 2018-2028 Strategic Plan, of which a one page summary follows, will form the basis of a 2018-2028 Investment Framework for the Fight Food Waste CRC. Both will be reviewed and updated every 2-3 years and will be accompanied in the future by a 2018-2033 Impact Model that tracks the CRC's performance against the Full Business Case Impact Tool along with the Grant Agreement and other key metrics. Annual Operational Plans will be extracted from the Strategic Plan and Investment Framework, as depicted below.



¹ BCG (2018) Tackling the 1.6-Billion-Ton Food Loss and Waste Crisis.

An Australia without food waste

The Fight Food Waste Cooperative Research Centre will increase industry profitability, address food insecurity and enhance Australia's reputation as a sustainable food producer

By uniting science and industry we will



REDUCE food waste throughout the supply chain



TRANSFORM unavoidable waste into innovative products



ENGAGE with industry and consumers to deliver behavioural change

2018
Baseline

1/3
of all food produced

\$20 Bn p.a.
in Australia

7.3 M T
food waste p.a.

298kg
per Australian per year

13.5 M T
of CO₂-e

4 M people
food insecure

2028

Grant Agreement targets

30 M T
of reduced food waste

\$2 B
Increase in industry profitability

20 M Kg
of rescued food distributed

5200
circular economy jobs

40
Future Leaders graduated

250 industry people trained p.a.

Deliver the Grant Agreement

We will first establish our initial 30-project research, development and extension program based on the best science and expertise with our existing participants. We will then develop and deliver new projects with existing and new participants that ensures we effectively deliver on all Grant Agreement performance milestones.

Deliver Future Initiatives

We will identify and target additional food loss and waste opportunities based on the National Food Waste Baseline and other key reports that will deliver significant food waste reduction and industry benefits to help achieve SDG 12.3. Additionally, we will scope and potentially develop a 10-year national behaviour change program that targets the entire food system, particularly consumers, with the Australian and state and territory governments and industry that reduces and prevents food waste from entering landfill.

Our Core Values



Collaboration
We will be greater than the sum of our parts



Innovation
Real impact on food waste reduction and commercial outcomes from the CRC activity



Participant Value Creation
Our participants get more than they expected from being part of the FFW CRC



Our People
To be a workplace of choice for our salaried and in-kind staff



Excellence
To deliver the best that we can for our participants



Accountability
We stand behind our people and our work



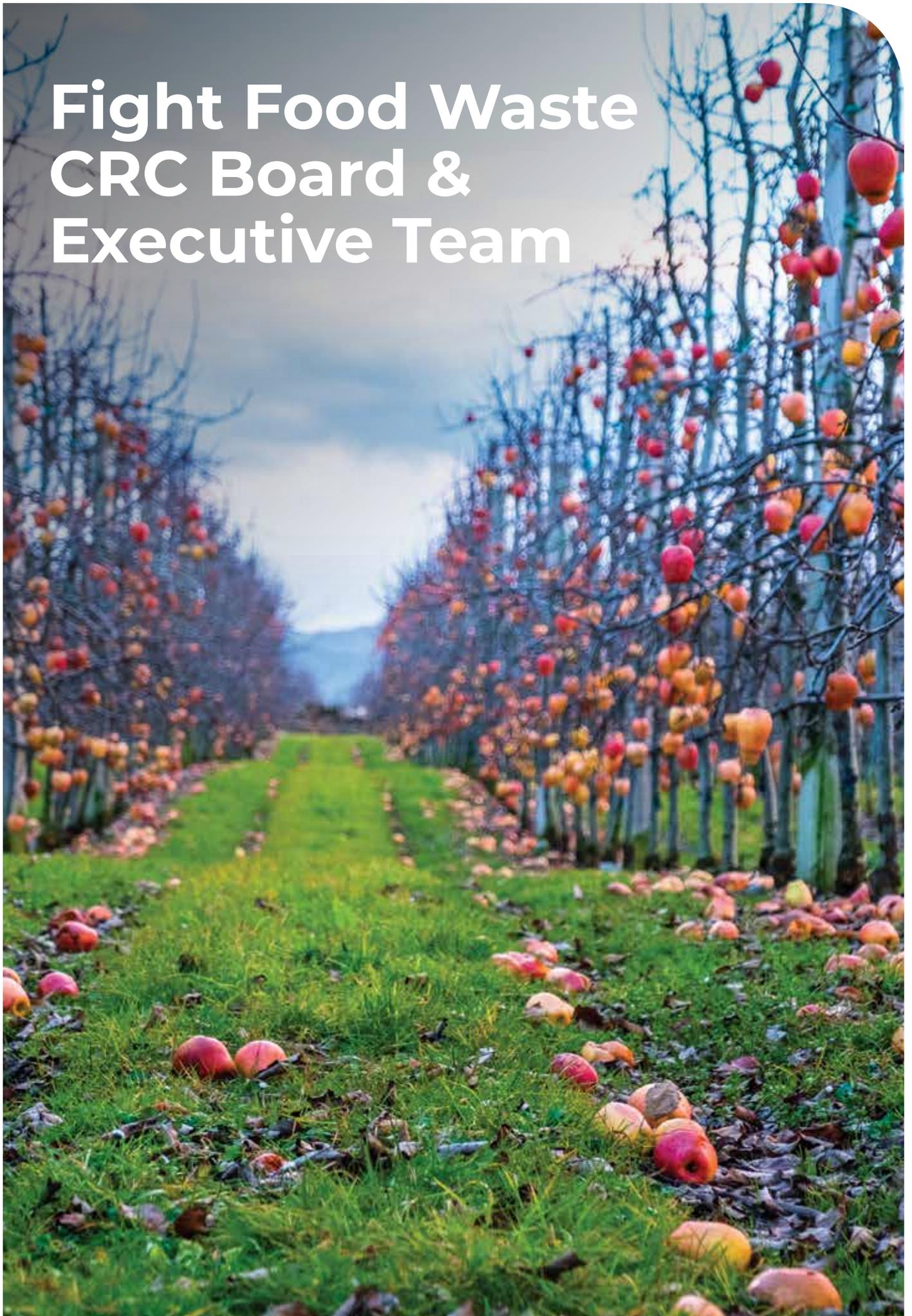
FIGHT FOOD WASTE
Cooperative Research Centre
REDUCE • TRANSFORM • ENGAGE



Australian Government
Department of Industry,
Innovation and Science

Business
Cooperative Research
Centres Program

Fight Food Waste CRC Board & Executive Team



Board



JOHN WEBSTER

NON-EXECUTIVE DIRECTOR & INDEPENDENT CHAIR

John Webster is the inaugural Independent Chair of the Fight Food Waste CRC and was integral to the success of the bid. He has provided leadership throughout the bidding and Fight Food Waste CRC establishment process and has kept a strong focus on industry impacts and good governance. John has extensive experience in issues surrounding both food waste and management of complex industry/research collaborations. His expertise includes strategy, governance, leadership, performance measurement, R&D project management, business and commercialisation in the food, agribusiness and food waste sectors.

John is a former CEO of Foodbank Australia, MD of Horticulture Australia, and GM of Meat & Livestock Australia. He is currently a Director of AgStrat Associates and Council Member of the International Meat Research 3G Foundation. His qualifications include a degree in Economics and he is a Graduate Member of the Australian Institute of Company Directors (AICD).

TOINE TIMMERMANS

NON-EXECUTIVE DIRECTOR

Toine Timmermans is a global leader in food waste management and the Fight Food Waste CRC's key connection to international food waste initiatives. He was an integral component of the successful bid, as remarked by the CRC Advisory Committee, and has since been indispensable to the establishment of the R&D portfolio. He is active globally in creating impact on food waste prevention via research, innovation and establishing partnerships.

Toine is currently the Program Manager of Sustainable Food Chains at Wageningen University & Research in the Netherlands, the Coordinator of the European Union food waste project REFRESH, and the Managing Director of the Foundation United Against Food Waste. The overall aim of the REFRESH project is to halve food loss and food waste across the post-harvest supply chain. His qualifications include a MSc in Agricultural Engineering and post-graduate studies in Business Strategy.





GEOFF STARR

NON-EXECUTIVE DIRECTOR

Geoff Starr has a wealth of experience in international branded foods. Geoff has worked for Unilever, been CEO for Mars Inc. companies internationally and George Weston foods. He has run very large businesses and also enjoyed the involvement in smaller enterprises. Geoff was chair of the Australian Food and Grocery Council, Australia's first industry advocate to government, former director of Foodbank Australia and current director of Australian Pork Ltd, Food Innovation Australia Ltd, Birch & Waite foods and chair of Cannpal Therapeutics.

Geoff's qualifications include a Bachelor of Arts with Honours and he is Graduate Member of the Australian Institute of Company Directors (AICD).

SANDRA HOOK

NON-EXECUTIVE DIRECTOR

Sandra has a track record in driving customer-centred business transformation and transitioning traditional organisations in rapidly evolving environments. She has extensive operational, digital, financial management and strategic experience built over 25 years as a CEO and in senior executive roles for some of Australia's largest media companies including News Limited, Foxtel, Federal Publishing Company, Murdoch Magazines and Fairfax.

Sandra's qualifications include courses from the Australian Graduate School of Management and she is Graduate Member of the Australian Institute of Company Directors (AICD). Sandra holds directorships of other companies including: RXP Services (ASX:RXP), MedAdvisor Limited (ASX:M-DR), IVE Group Limited (ASX:IGL), Sydney Fish Markets, WYZA Limited, Royal Botanic Gardens and Sydney Harbour Federation Trust.



CHRISTINE GIULIANO

NON-EXECUTIVE DIRECTOR

Christine has had over 25 years' experience in Australia's food technology and processing and health and wellness sectors, with a demonstrated history of transforming businesses and driving sales growth/profitability. Previous positions include Chief Operating Officer at Nature's Care, Australia's third largest vitamins company, Managing Director of Naturex Australia, the world's largest processor of herbal and botanical extracts, and Managing Director of Kingfoods Australia (now KF Specialty Ingredients).

Christine holds a Bachelor of Applied Science in food and nutrition and she is a Graduate Member of the Australian Institute of Company Directors (AICD). She is also a Professional Member of the Australian Institute of Food Science and Technology (AIFST) and a member of Complimentary Medicines Australia.



ROBBIE DAVIS

NON-EXECUTIVE DIRECTOR

Robbie has business experience in both the private and public sectors domestically and internationally as a CEO and Director. She is also a primary producer (beef cattle) in the upper south east of South Australia. She has an intimate understanding of agricultural production systems, particularly sustainable whole of industry value chains from the paddock to the end-consumer. Following almost ten years living and working in Southeast Asia (Singapore, Indonesia, Brunei), she was self-employed as an agribusiness consultant until her appointment as CEO of Potatoes South Australia in 2012. With food security, food safety and reduction of food waste among issues of predominant importance to her, Robbie aims to participate in the re-positioning of Australian agribusiness as the nation's most significant industry.

Robbie's qualifications include a Bachelor of Agricultural Science, a Master of Business Administration, and she is a Graduate Member of the Australian Institute of Company Directors (AICD). She was profiled under PIRSA's Women Influencing Agriculture and Regions in 2015 and is the RIRDC 2016 SA Rural Woman of the Year.

ALAIN PILLAY

NON-EXECUTIVE DIRECTOR

Alain Pillay is the Managing Director of Nexus Strategem Pty Ltd, a boutique financial and economic advisory firm specialising in corporate strategy, and mergers and acquisitions. Since 2011 Nexus has been involved in acquisitions across the sugar, beef, port and technology sectors. Prior to establishing Nexus, Alain was the Queensland state lead partner for Deloitte's economics and strategy unit and was responsible for establishing and building the practice into one of the largest economic groups in Queensland. A member of Deloitte's young leaders group and a member of Deloitte economics executive team, Alain worked extensively across Asia, Middle East and America.

Alain has a strong investment network both domestically and internationally and has experience in corporate governance as a company secretary of a listed company. Alain is tertiary qualified in both accounting and economics and is a member of the Australian CPA's, Institute of Company Directors (AICD) and Chartered Secretaries of Australia.



Executive Team



DR STEVEN LAPIDGE

CHIEF EXECUTIVE OFFICER

Steven Lapidge is the inaugural CEO of the Fight Food Waste CRC. He has spent much of his 20-year career working for or with agribusiness CRC's, with a strong focus on New Product Development and commercialisation. Steven led the development of the Fight Food Waste CRC bid and in recent years has represented Australia at G20, OECD and national food waste forums. He is a member of the NFWS Steering Committee and a Non-Executive Director of the Australian Institute of Food Science and Technology (AIFST).

Steven's qualifications include a BSc(Hons), PhD and an MBA. He is a Graduate of the Australian Institute of Company Directors (AICD) and a Professional Member of AIFST. Steven's previous research saw him awarded the Fulbright Professional Business/Industry (Coral Sea) Scholarship in 2010.

IAN HARDWICK

CHIEF FINANCIAL OFFICER

Ian joined Fight Food Waste CRC in February 2019 after having spent nearly eight years as CFO of Deep Exploration Technologies CRC, which was wound up in late 2018 at the end of its funding life, having successfully licensed a number of new technologies to the mineral exploration services sector. Prior to that role, Ian worked within an accounting firm providing business advisory and compliance services across a range of industries. Ian is a Commerce graduate, Chartered Accountant and Graduate of the Australian Institute of Company Directors (AICD).





PROFESSOR VINCENT BULONE

RESEARCH DIRECTOR

Vincent Bulone is the Director of Adelaide Glycomics, an analytical centre for complex carbohydrates, and Director of the Research Consortium Program for Agricultural Product Development supported by the South Australia Department for Industry and Skills. Vincent was also Director of the ARC Centre of Excellence in Plant Cell Walls until June 2018. His activities comprise fundamental research on plants and microorganisms as well as applied research in green chemistry and biotechnology for the development of products derived from carbohydrate polymers and other biomolecules. Vincent's R&D activities are relevant to multiple sectors, including agriculture and waste management; biomaterials; biorefinery; bioenergy; food sustainability; and disease control. Prior to his recruitment in Adelaide in 2015, Vincent was Director of the Centre for Biomimetic Fibre Engineering and The Advanced Carbohydrate Materials Consortium in Stockholm, Sweden. He is the founder of the spin-out company CarbOzide Pty Ltd, which exploits his invention on UV protective materials based on carbohydrates and natural molecular sunscreens from algae.

ASSOCIATE PROFESSOR KARLI VERGHESE

REDUCE PROGRAM LEADER

Karli is the REDUCE Program Leader in the Fight Food Waste CRC. She is also a Principal Research Fellow in the Industrial Design program of the School of Design, RMIT University, Melbourne. Karli is predominantly involved in designing, developing and leading industry applied and government funded research projects in the fields of food waste, packaging sustainability, waste management and life cycle assessment. She also supervises Honours, Masters and PhD students and teaches into the Industrial Design program.

Her research projects have included the development of decision support tools for packaging, resource efficiency, food waste, eco-design and environmental impact reduction strategy (informed by life cycle assessment) for Australia's Antarctic research station (Casey). Karli is also a Fellow of the Australian Institute of Packaging and a member of the international Packaging Save Food Research Group.





DR PAUL LUCKMAN

TRANSFORM PROGRAM LEADER

Paul is a Chemical Engineer from the University of Queensland, with a Masters in Biological Engineering and a PhD in Biomaterials Engineering. Throughout his career he has developed a specialisation in bio-polymer process engineering technologies and materials. Paul has worked on the boundary between academia and industry with a range of companies from start-ups to several of the world's largest users and manufacturers of biopolymers to develop product solutions for a range industry sectors such as packaging, agriculture, mining, and food. His research career to date has been entirely collaboratively funded through industry-linked projects that have relied on close relationships with industry partners, including ARC-Linkages, Advance Queensland Innovation Partnerships, and is currently an Advance Queensland Research Fellow. Through these projects he has provided valuable research and teaching opportunities to Universities while maintaining on-going support to industry partners; improved processing methods and delivered novel products to market.

PROFESSOR DAVID PEARSON

ENGAGE PROGRAM LEADER

David Pearson is the ENGAGE Program Leader in the Fight Food Waste CRC. The ENGAGE Program is responsible for educating over 40 future industry professionals with PhD or Master level qualifications, disseminating research outputs through an Industry Connection Hub, and encouraging behaviour changes amongst consumers to reduce the amount of food wasted.

David's research expertise is in leading multidisciplinary collaborations addressing issues of concern in society. Most recently this has focused on encouraging consumers to make considered choices, such as dietary options to improve personal health and contribute to a more environmentally sustainable global food system. In addition, he has considerable leadership achievements in tertiary education as well as significant engagements with industry, government and charity sectors. He is a Professor of Marketing in the School of Business and Law, and at the Sydney campus of Central Queensland University.





DR VALERIA TOROK

FOOD SAFETY AND INTEGRITY THEME LEADER

Valeria Torok is the Fight Food Waste CRC Food Safety and Integrity Theme Leader. She is also the Food Microbiology Sub-Program Leader with the South Australian Research and Development Institute (SARDI), a division of PIRSA, Food Sciences Group based at the Waite Campus in Adelaide. Valeria has a keen interest in food safety research, functional foods and the role of gut microbiota in livestock production and gut health. She also has product development interests in the creation of novel, rapid and sensitive diagnostics for foodborne hazards and foodborne virology. Her team has been instrumental in providing Australian capability for foodborne virus testing in foods implicated in recent foodborne outbreaks. Within the Fight Food Waste CRC Valeria will ensure that any ingredient, food or packaging products developed demonstrate the upmost food safety and integrity.

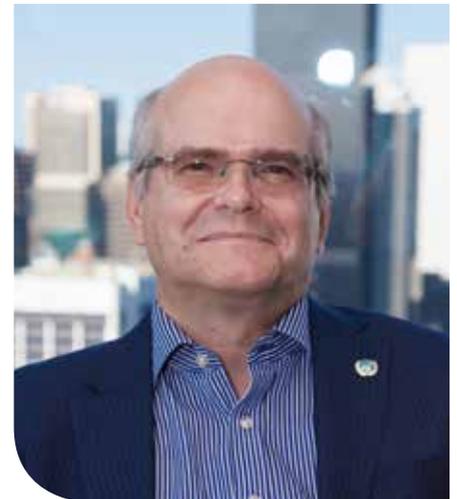
During her 20 year career Valeria has worked closely with both industry and regulatory bodies, and has formed multidisciplinary scientific collaborations both nationally and internationally. Her qualifications include a BSc(Hons) and PhD.

MARK BARTHEL

SPECIAL ADVISOR: FOOD WASTE

Mark joined the Fight Food Waste CRC team in July 2019. Mark is a highly motivated and experienced business and sustainability professional with strong leadership, communications and negotiating skills and a successful 25-year track record of driving sustainable innovation in agri-food; and supporting the development and implementation of sustainable food systems. This includes over 15 years' experience in quantifying and preventing food loss and waste in the UK, Europe, North and South America, Africa and Australia. This body of work has involved: developing the international evidence base for food loss and waste; national baseline development (volumetric, compositional and behavioural); strategy development and the annual tracking of progress at corporate, sectoral and national levels; establishing world-leading public/private sector voluntary agreements to reduce food waste, redistribute surplus food to those in need and support food waste valorisation; running award winning consumer-facing behaviour change campaigns; and implementing over 50 research and innovation projects with food and drink companies and their trade bodies.

Mark's qualifications include a BSc (Hons) in Environmental Science and an MSc in Integrated Environmental Studies. Before working on environmental and sustainability issues, Mark's roots were in the international finance covering foreign exchange and commodities markets and fraud and anti-fraud programs.



About Fight Food Waste CRC



Purpose, Mission and Vision

An Australia without food waste.

By uniting science and industry we will **REDUCE** food waste across the supply chain, **TRANSFORM** unavoidable waste into innovative products, and **ENGAGE** with industry and consumers to deliver behavioural change.

The Fight Food Waste CRC will increase industry profitability, address food insecurity and enhance Australia's reputation as a sustainable food producer.

Values



Collaboration

We will be greater than the sum of our parts



Innovation

Real impact on food waste reduction and commercial outcomes from the CRC activity



Participant Value Creation

Our participants get more than they expected from being part of the FFW CRC



Our People

To be a workplace of choice for our salaried and in-kind staff



Excellence

To deliver the best that we can for our participants



Accountability

We stand behind our people and our work

History

The Australian Government CRC Program commenced in 1990 and supports industry-led collaborations between industry, researchers and the community. With over 220 CRC's funded since its inception it's a proven model for linking researchers with industry to focus on research and development towards use and commercialisation. The program is administered by the Australian Government Department of Industry, Innovation and Science.

It aims to:

- Improve the competitiveness, productivity and sustainability of Australian industries, especially where Australia has a competitive strength and in line with government priorities
- Foster high quality research to solve industry-identified problems through industry-led and outcome-focused collaborative research partnerships between industry entities and research organisations
- Encourage and facilitate small and medium enterprise (SME) participation in collaborative research.

The history of the Fight Food Waste CRC is important to recognise. The concept for a food waste focused CRC was first discussed in late 2013 within the Department of Primary Industries and Regions South Australia (PIRSA) with Professor Pauline Mooney of the South Australian Research & Development Institute (SARDI, a division of PIRSA) championing the cause. The bid was related to the 2013 National Food and Nutrition Research and Development and Technology Transfer Strategy, in particular the Resource Efficiency and Sustainability Taskforce, that was co-chaired by SARDI and the Queensland Department of Agriculture, Fisheries and Forestry. Importantly, PIRSA-SARDI and QDAFF remain the two largest contributors to the Fight Food Waste CRC.

Due to CRC funding disruptions to Round 17 in 2014 and an alternative proposal in Round 18 in 2016 it was not until December 2016 that planning for the current CRC commenced, with PIRSA as the proponent. Throughout 2017 momentum built and the bid was shortlisted in October 2017. The Full Business Case was submitted on December 13, 2017, with members of the bid team, comprised of the interim Fight Food Waste CRC Management Team and the Industry Advisory Committee, being interviewed on February 8, 2018.

On April 12, 2018, the Fight Food Waste CRC was announced as a successful Round 19 CRC. Unfortunately a food and wine fraud research and development program focussed on provenance and authenticity that was part of the original bid was not funded. This resulted in 15 participants departing the CRC, whose contributions to the bid should not be forgotten.

The \$120 million 10-year Fight Food Waste CRC was established on July 1, 2018 and the Grant Agreement was executed with the Australian Government in August 2018.

Our Participants

The Fight Food Waste CRC founding participants include:

- Abalone Association of Australasia
- Abalone Council of Australia Ltd
- Australian Council of Prawn Fisheries
- Australian Country Choice Production
- Australian Food & Grocery Council
- Australian Institute of Food Science & Technology
- Australian Institute of Packaging Inc
- Australian Organics Recycling Association
- Australian Packaging & Processing Machinery Association
- Australian Food Cold Chain Council
- Bowen Gumlu Growers Association
- Central Coast Industry Connect
- Central Queensland University
- Chameleon Asset Protection
- ChemCentre
- Curtin University
- Food & Fibre Gippsland
- Empauer
- Entopia Biotechnologies
- FAVCO/Green Valley
- Fisheries Research & Development Corporation
- Food Innovation Australia Limited
- Food South Australia
- Foodbank Australia
- Green Industries SA
- Gretals Australia
- Honey and Fox
- KPMG
- NSW Environmental Protection Agency
- OzHarvest
- Pacific Coast Produce
- Peats Soils and Garden Supplies
- Piper Alderman
- Planet Protector Packaging
- Potatoes South Australia
- Primary Industries & Regions South Australia
- Queensland Department of Agriculture and Fisheries
- Queensland University of Technology
- Queensland Urban Utilities
- Regional Development Australia Murraylands & Riverland
- RMIT University
- SA Potato Company
- Sampano
- Sustainability Victoria
- Swinburne University
- Swisse Wellness
- The Mitolo Group
- Thomas Foods International Fresh Produce
- University of Adelaide
- University of Queensland
- University of Southern Queensland
- Waste & Resource Action Programme (UK)
- Whitsunday Regional Council
- Woolworths Group
- Zerella Fresh

The Fight Food Waste CRC has recently welcomed four new participants:

- Transport Canberra City Services Directorate (ACT NoWaste)
- Western Australia Department of Water and Environmental Regulation
- Toowoomba and Surat Basin Enterprise Pty Ltd
- Queensland Government Department of Environment and Science

The Fight Food Waste CRC is looking forward to welcoming new participants in the future.

Food Waste: Our Environment



A Global Issue

We need to work together.

Globally 32% of food produced for human consumption, more than 1.3 billion tonnes, is lost in primary production, processing or manufacturing, or wasted in retail, food service or by consumers at an estimated cost of \$1.75 trillion per annum. This is occurring at a time when 800 million or 1 in 9 people globally are food insecure. Additionally, wasted food requires a cropland the size of China to grow, uses 25% of all water used in agriculture, and goes on to produce 8% or 3.5 billion tonnes, of global greenhouse gas emissions when it rots in landfill. If food waste were a country, it would be the world's third largest emitter of greenhouse gases behind the U.S. and China. Yet an estimated 60% of food waste is avoidable.²

Two of the leading programs involving food waste reduction and transformation internationally are the European Union Horizon 2020-funded REFRESH program (Resource Efficient Food and drink for the Entire Supply chain; led by Wageningen University & Research, The Netherlands) which finished in June 2019, and the Waste & Resource Action Program (WRAP) in the United Kingdom which runs the world-leading Love Food Hate Waste Program. The former was led by Toine Timmermans, an inaugural Non-Executive Director of the Fight Food Waste CRC, and the latter, WRAP, is a Supporting Participant. The Fight Food Waste CRC Special Adviser- Mark Barthel was employed by WRAP until 2016.

Other key European programs include the Food & Agriculture Organisation (FAO) SAVE FOOD program, the United Nations Environmental Program (UNEP) Think.Eat.Save campaign, and the OECD Food Chain Analysis Network.

In the United States the World Resources Institute (WRI) and ReFED are making significant contributions to the food loss and waste debate. WRI also acts as the secretariat for Champions 12.3 - a unique coalition of executives from governments, businesses, international organisations, research institutions, and civil society dedicated to inspiring ambition, mobilising action, and accelerating progress toward achieving SDG Target 12.3. The Fight Food Waste CRC is an official Friend of Champions 12.3.



² WRAP (2017) *Estimates of Food Surplus and Waste Arisings in the UK*

Sustainable Development Goals

The 2030 Agenda for Sustainable Development was adopted by all United Nations Member States in 2015, including Australia. As explained on the United Nations Sustainable Development Knowledge Platform: “It provides a shared blueprint for peace and prosperity for people and the planet, now and into the future. At its heart are the 17 Sustainable Development Goals (SDGs), which are an urgent call for action by all countries - developed and developing - in a global partnership.”

The Fight Food Waste CRC is aiming to address six of the 17 SDG's, in particular SDG 12: Ensure sustainable consumption and production patterns. Target 3: By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses.

Additionally, the Fight Food Waste CRC aims to contribute to Sustainable Development Goals 2, 9, 11, 13 and 15.

2 ZERO HUNGER



SUSTAINABLE DEVELOPMENT GOAL 2

End hunger, achieve food security and improved nutrition and promote sustainable agriculture.

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



SUSTAINABLE DEVELOPMENT GOAL 9

Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.

11 SUSTAINABLE CITIES AND COMMUNITIES



SUSTAINABLE DEVELOPMENT GOAL 11

Make cities and human settlements inclusive, safe, resilient and sustainable.

12 RESPONSIBLE CONSUMPTION AND PRODUCTION



SUSTAINABLE DEVELOPMENT GOAL 12

Ensure sustainable consumption and production patterns. Target 12.3: By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses.

13 CLIMATE ACTION



SUSTAINABLE DEVELOPMENT GOAL 13

Take urgent action to combat climate change and its impacts.

15 LIFE ON LAND



SUSTAINABLE DEVELOPMENT GOAL 15

Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.

National Food Waste Strategy

In 2015 food waste was estimated to total \$20 billion per annum in Australia, depending on seasonal factors and commodity prices.^{3,4} In 2017 FIAL recognised that food waste reduction and extraction had the highest predicted compound annual growth rate of 28-35% for investment in sixteen food and agriculture opportunities in Australia to 2025.⁵

In November 2017 the Australian Government Department of Environment and Energy launched the National Food Waste Strategy⁶ (NFWS) that committed Australia to Sustainable Development Goal 12, Target 3: By 2030, halve per capita food waste at the retail and consumer levels and reduce food losses along the production and supply chains, including post-harvest losses. The NFWS included a commitment to creating an independent governance body to develop an implementation plan, establish a voluntary commitment, and establish a National Food Waste Baseline (NFWB). It should be noted that the development of the NFWS occurred at the same time as the development and submission of the Full Business Case for the Fight Food Waste CRC and therefore they occurred largely independently.

The Fight Food Waste CRC Strategic Plan 2018-2028 provides the opportunity to unite the intent of the NFWS with the plans of the Fight Food Waste CRC.

The NFWS provided an initial funding commitment of \$1.37 million over 2 years (2018/2019), with \$1 million in funding directed to FIAL to develop the NFWS Implementation Plan or Roadmap and monitoring and evaluation framework, as well as a voluntary commitment program with industry.

Halving all food waste will require a minimum reduction of 149 kg per person by 2030

Of the remaining \$370,000, \$200,000 was directed to the consulting firm Arcadis to deliver the NFWB, and \$170,000 was directed to Ernst & Young (EY) to deliver a return on investment study.

The NFWS provides a framework for action towards achieving the Australian Government aim of halving food waste by 2030. It is important to note that the Australian Government commitment goes beyond SGD 12.3 as it commits Australia to reducing food waste by 50% across the entire supply chain, rather than retail and consumer food waste only. Based on the 2019 NFWB, discussed in more detail later, halving all food waste will require a minimum reduction of 149 kg per person by 2030 as 55% of Australia's food waste occurs in primary production and manufacturing, whereas

³ Lapidge (2015) *Primary Production Food Losses: Turning losses into profit*. South Australian Research and Development Institute, Primary Industries and Regions South Australia.

⁴ Beteta (2015) *Understanding and estimating the value of food losses and waste in Australia based on industry expert opinion*. Adelaide University Masters Thesis.

⁵ FIAL (2017) *Size of the Prize, An overview of 16 global opportunities for Australian food and agribusinesses*.

⁶ Department of Environment (2017). *National Food Waste Strategy, Halving Australia's Food Waste by 2030*.

⁷ *Champions 12.3 (2019) Guidance on interpreting Sustainable Development Goal Target 12.3*.

National Food Waste Strategy Framework for Action

Priority	Outcome	Focus
Policy Support	Policies are supportive of food waste reduction and repurposing	<ul style="list-style-type: none"> Establishing a NFWB and methodology to measure progress against our goal Identifying areas to target investment Establishing a voluntary commitment to reduce food waste Enabling legislation to better support food waste reductions and repurposing
Business improvements	Improvement and adoption of technologies, processes and actions to reduce food waste	<ul style="list-style-type: none"> Identify areas for improvement Supporting technology adoption Encouraging collaboration Normalising food waste considerations into business practices
Market development	Development of markets to support the repurposing of food waste	<ul style="list-style-type: none"> Identifying food waste composition and nutritional value to develop new markets Encouraging new innovations Connecting food waste sources to users
Behaviour change	Practices and attitudes towards reducing food waste are being adopted and sustained	<ul style="list-style-type: none"> Changing consumer behaviour Engaging the workforce on food waste



The above NFWS framework presents four key priority areas to address food waste in Australia. Below is a brief assessment of how each focus area is tracking in 2019:

POLICY SUPPORT

The area of policy support includes:

- 1. The establishment of a NFWB** occurred in March 2019, and a methodology to measure progress against the goal is occurring as part of the development of the NFWS Implementation Plan in combination with the Fight Food Waste CRC REDUCE Program.
- 2. Identify areas to target investment** is currently occurring as part of the NFWS Implementation Plan and the development of this strategy.
- 3. Establishing a voluntary commitment to reduce food waste** is being undertaken by FIAL using the Fight Food Waste CRC Special Advisor – Food Waste, Mark Barthel.
- 4. Enabling legislation to better support food waste reductions and repurposing** is a focus area that is currently attracting little attention but could deliver significant food waste reduction. Targets should include legislation on standardising Use By vs Best Before dates, and on food rescue donation, storage and transportation tax incentives.

BUSINESS IMPROVEMENTS

The area of business improvements includes:

- 1. Identifying areas for improvement** is currently occurring through Fight Food Waste CRC projects such as DIRECT, the Industry Connection Hub and external projects such as training courses provided by the Australian Institute of Packaging, the Australian Food & Grocery Council Sustainability Seminars and the New South Wales and Victoria, Your Business is Food, program.
- 2. Supporting technology adoption** is a focus of the Fight Food Waste CRC TRANSFORM program, universities and CSIRO.

- 3. Encouraging collaboration** across sectors and through industry partnerships is a focus of FIAL and the Fight Food Waste CRC.
- 4. Normalising food waste considerations into business practices** is the aim of the NFWS Voluntary Commitment and the Fight Food Waste CRC Industry Connection Hub.

MARKET DEVELOPMENT

The area of market development includes:

- 1. Identifying food waste composition and nutritional value to develop new markets** is a focus of the Fight Food Waste CRC TRANSFORM program, universities and CSIRO.
- 2. Encourage innovation** is a focus of FIAL, CSIRO and the Fight Food Waste CRC.
- 3. Connecting food waste sources to users** is occurring through the food rescue charities such as Foodbank Australia and OzHarvest using apps such as Y Waste and FoodCloud.

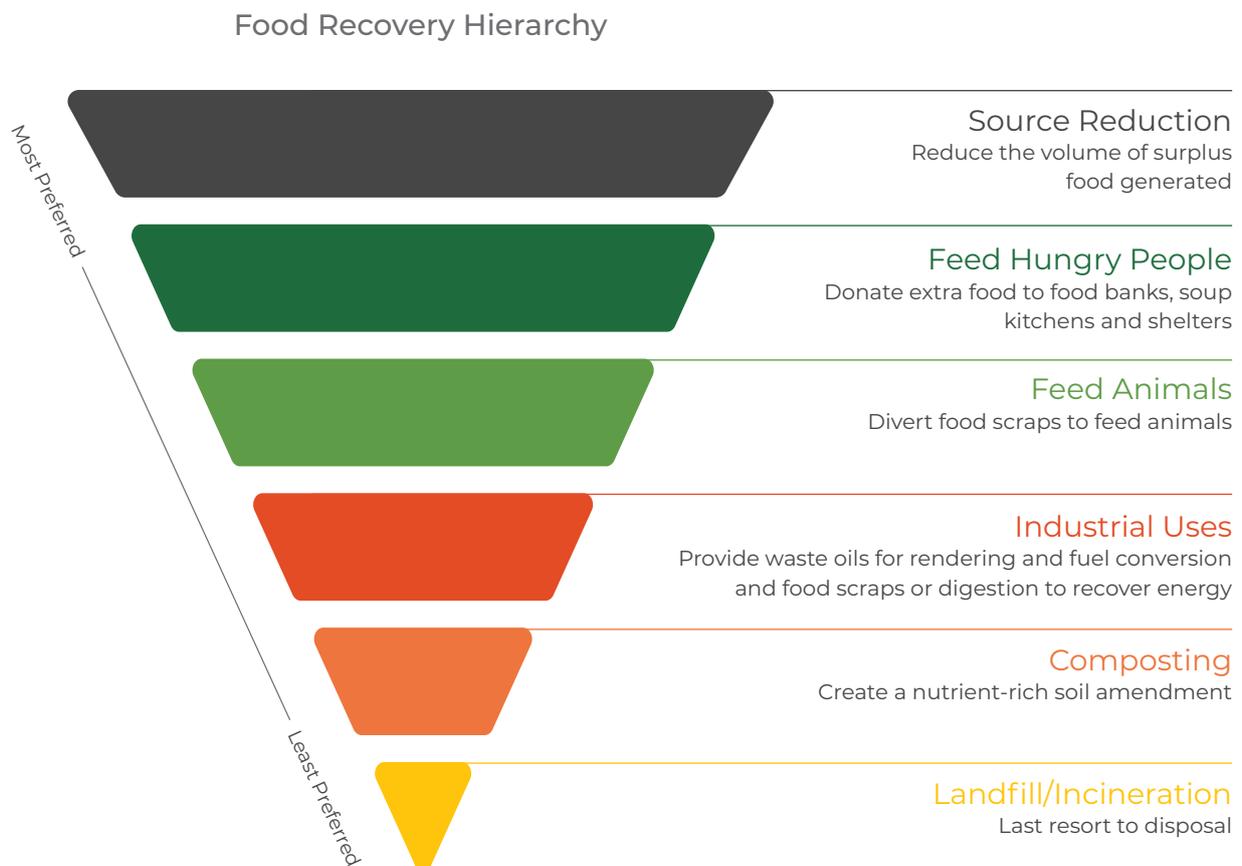
BEHAVIOUR CHANGE

The area of behaviour change includes:

- 1. Changing consumer behaviour** has been occurring in New South Wales and Victoria and more recently Brisbane through the delivery of the WRAP Love Food Hate Waste Program. The Fight Food Waste CRC currently has all mainland Australian states and the Australian Capital Territory working together on the Understanding Consumer Food Waste Attitudes, Behaviours and Interventions project, the initial output being an Australia-wide survey of over 5,000 consumers.
- 2. Engaging the workforce on food waste** is the intended outcome of the Fight Food Waste CRC Industry Connection Hub and a key role of FIAL.

The Food Waste Hierarchy

The original food waste recovery hierarchy depicted below was developed by the United States Environmental Protection Agency (EPA). It provides a framework for the management of food surplus and food waste. It puts forward that prevention, through minimisation of food surplus and avoidable food waste, is the most attractive option. The second most attractive option involves the distribution of food surplus to groups affected by food poverty, followed by the option of converting food waste to animal feed. The least attractive options include incineration and disposal into landfill and sewers. The food waste hierarchy will act as a guide for Fight Food Waste CRC investment.



Food Waste Destinations

It is important to recognise that not all food waste destinations contribute to meeting SDG Target 12.3, as detailed in the Champions 12.3 paper Guidance on interpreting SDG Target 12.3.⁸

As detailed in Guidance on interpreting Sustainable Development Goal Target 12.3⁸ and replicated below, the only three destinations that do contribute are:

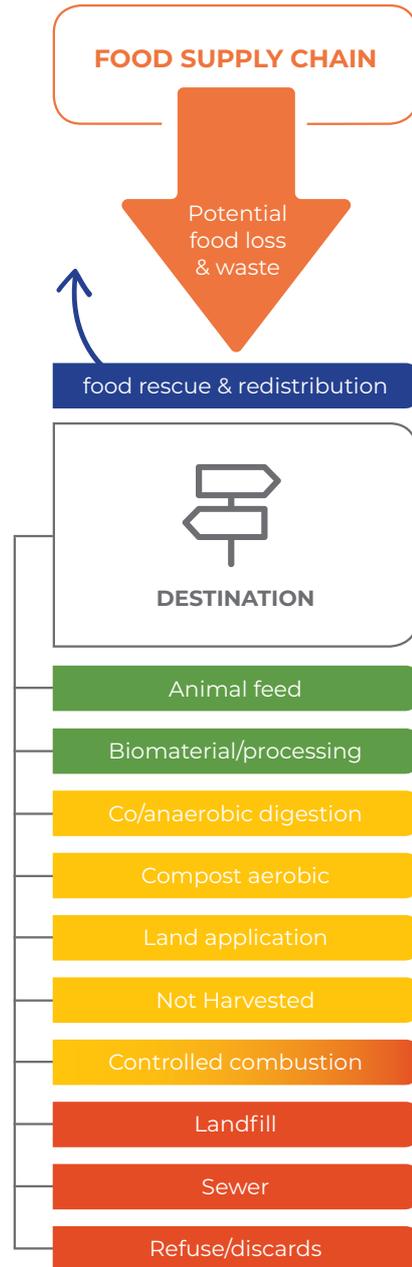
1. Prevention and redistribution to people
2. Animal feed
3. Biomaterial/processing.

As such, they will remain the highest priority for future Fight Food Waste CRC investment.



With energy recovery

Without energy recovery



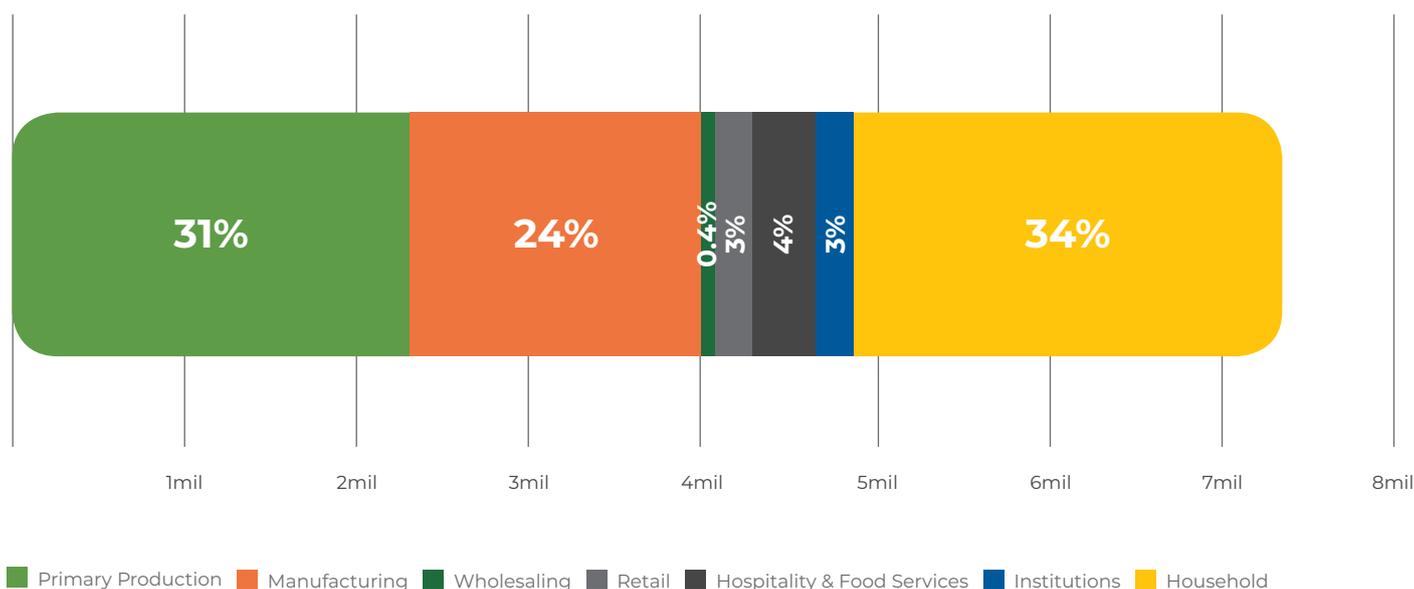
⁸ Champions 12.3 (2019) Guidance on interpreting Sustainable Development Goal Target 12.3.

National Food Waste Baseline

In March 2019 the Hon Melissa Price, the Australian Government Minister for the Environment, launched the NFWB⁹ from the Fight Food Waste CRC Adelaide headquarters. The report detailed that 11.3 million tonnes (MT) of food in Australia in 2016/2017 did not meet its intended destination, with near 4 MT diverted to food rescue and animal feed. Of the remaining 7.3 MT of waste, 31% was generated in primary production, 24% in food manufacturing and 34% by households, as depicted in the following graph. The result of this study is that the Australian Government benchmark for per capita food waste is 298 kg per person, which will need to be reduced to 149 kg per person by 2030 to achieve SDG 12.3.

National food waste generation by sector, 2016/2017 (Food waste from the transport sector is integrated into these quantities)

Food Waste Generated 2016/2017 (tonnes per annum)



As detailed in the following table, more than 3 MT or 42% of food waste is currently disposed of in landfill, with this figure increasing to 92% for household food waste. Clearly, reducing household food waste to prevent it from entering landfill must be a key target for state and territory governments, the NFWS, as well as the Fight Food Waste CRC, both to reduce food waste and to prevent the estimated 13.5 MT of CO₂ equivalent greenhouse gas emissions generated from rotting food in landfill.

⁹ Arcadis (2019) National Food Waste Baseline, Final assessment report.

A summary of destinations for food waste and surplus, quantified by sector (kT)

Destination	Primary Production	Manufacturing	Wholesale	Retail	Hospitality	Institutions	Households	Total	Total (kg) per capita
Bio-based materials/ biochemical processing	-	105	-	-	-	-	-	105	4.3
Co-digestion/ anaerobic digestion	-	74	-	8	-	-	-	82	3.3
Composting/ aerobic processes	-	716	14	47	17	-	198	992	40.4
Other – Recovery	-	113	-	-	-	-	-	113	4.6
Controlled combustion (energy recovery)	-	7	-	-	-	-	-	7	0.3
Land application	-	487	-	-	-	-	-	487	19.8
Not harvested/ploughed in	2,270	-	-	-	-	-	-	2,270	92.3
Other – Disposal	-	-	-	-	-	-	-	-	-
Landfill	-	62	13	177	307	209	2,302	3,070	124.8
Sewer/ Wastewater treatment	-	194	-	-	-	-	-	194	7
Total	2,270	1,758	27	232	324	209	2,500	7,320	297.7
Animal feed	337	3,437	25	135	-	-	-	3,934	160
Food rescue	11	19	1	17	0.4	-	-	48	2

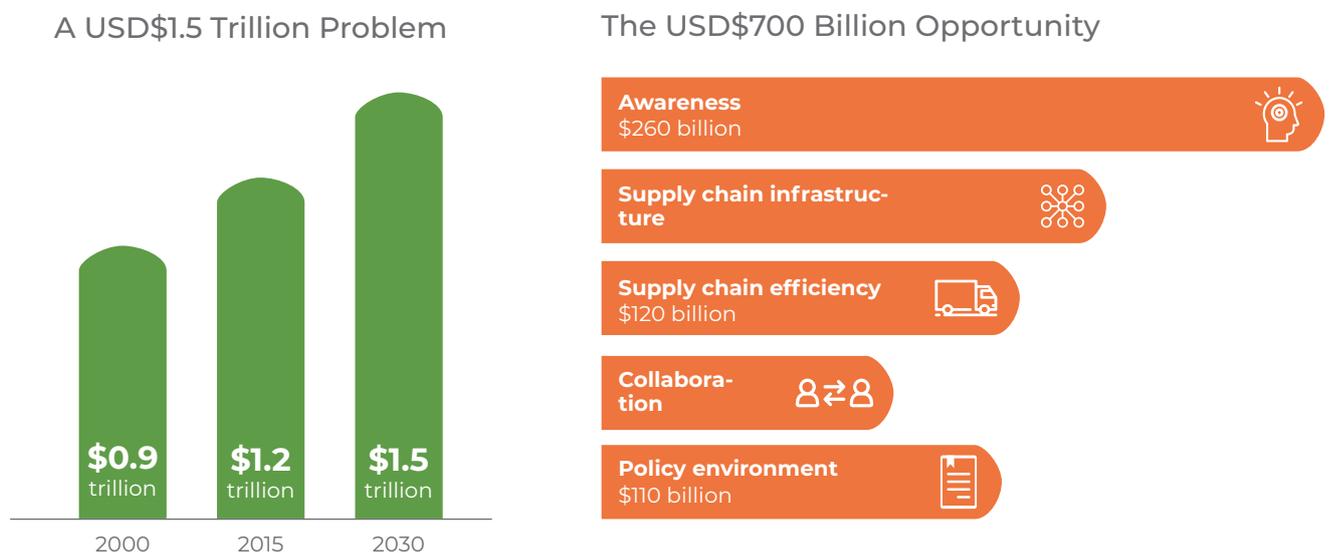
Future Predictions

In 2018 the Boston Consulting Group estimated

By 2030 annual food loss and waste will hit 2.1 billion tons globally worth USD\$1.5 trillion

if trends regarding food waste continue on their current trajectories.¹⁰

They also report that if the five key drivers contributing to food waste depicted in orange below are addressed we could reduce the dollar value of annual food loss and waste by nearly USD\$700 billion and create major progress toward hitting the SDG 12.3. Outlined in the figure below are the recommended focus areas to address.



Source: DBCG FLOW model.

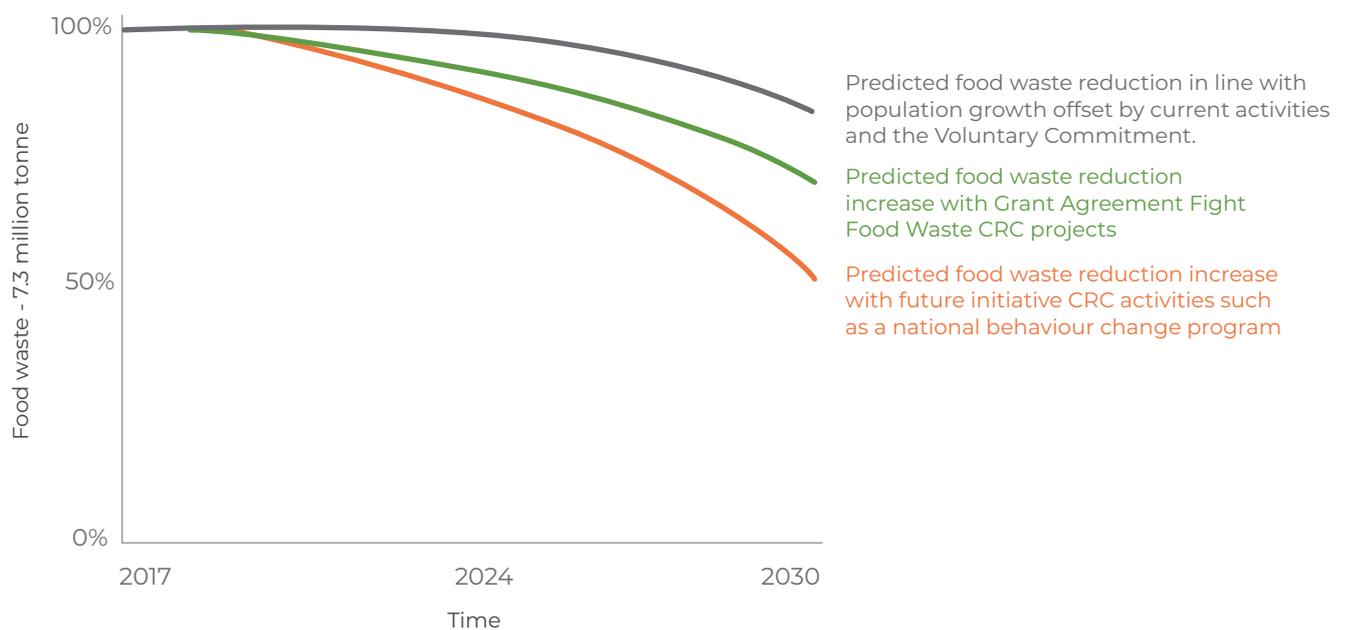
Note: The 2030 forecast is based on a "business as usual" scenario in which trends continue on their current trajectories.

¹⁰ BCG (2018) Tackling the 1.6-Billion-Ton Food Loss and Waste Crisis.

Based on the Full Business Case Impact Tool, the Fight Food Waste CRC expects to deliver \$2 billion in economic, environmental and social benefits to Australian society after costs of implementation between 2018 and 2033. This includes an estimated \$1.5 billion in benefits from transforming waste resources, \$327 million in benefits from reducing supply chain losses, and \$100 million in benefits from education, training and behaviour change.

Presented below is a theoretical prediction of the reduction of food waste in Australia between the 2016/2017 NFWB findings and the 2030 SDG 12.3 target based on the various activities outlined in this strategic plan.

Theoretical Food Waste Reduction in Australia 2016/2017 to 2030



It is important to recognise that even the most active and successful countries at food waste reduction, such as the United Kingdom and the Netherlands, are yet to achieve SDG 12.3.

Working Together

No one group, government or company can achieve SDG 12.3 on their own. Rather, real progress will require commitment and coordinated action from consumers, governments, NGOs, farmers, and companies. Below is an indication of the key stakeholders that will be required to collaborate.

Australian Government

The Australian Government reports that it is investing more than \$50 million to support research directly related to reducing food waste in conjunction with industry through the Rural Research & Development Corporations, CRCs (including the Fight Food Waste CRC), the Entrepreneurs' Programme, CSIRO and the Food and Agribusiness Growth Centre, FIAL. The breakdown of funding between different departments is on the next page.

State and territory governments

State and territory governments have primary responsibility for managing waste, including food waste. Activities being supported by one or more state and territory governments include community education programs, such as Love Food Hate Waste in New South Wales, Victoria and Brisbane, providing funding to the manufacturing, processing and transport industries to reduce waste in their businesses and delivering programs with businesses that sell food to demonstrate money savings by diverting food waste at source. Example programs are Your Business is Food in New South Wales and Make Food Waste your Business in Victoria.

Local government

Over 500 local governments across Australia manage waste within the legislative frameworks established by the states and territories. Local governments interact directly with their communities and have a significant role in organising waste collection and processing or disposing of food waste. Local governments are taking steps to reduce food waste through a range of programs such as rebates for households to purchase compost bins and worm farms.

The Fight Food Waste CRC is committed to working in a coordinated fashion with all parties involved in fighting food waste in Australia and achieving SDG 12.3.

Industry and business

Industry and business are playing their part in finding solutions by value-adding food waste through composting with other organic materials, producing bioenergy, and developing innovative solutions to convert food waste to new food products and animal food. They are also investing in infrastructure for on-site processing of food waste, partnering with food rescue organisations to donate food that would otherwise be wasted and investigating packaging options to help reduce food waste.

Food rescue organisations

Food rescue organisations contribute to reducing wasted food that is suitable for human consumption in the order of 48 KT per annum, mostly from the manufacturing and retail sectors. In rescuing food that would otherwise be thrown away, these organisations provide those in need with a critical service while addressing food insecurity. Food rescue organisations are proactively partnering with businesses across the supply chain to capture and redistribute surplus food that would otherwise go to landfill.

Following is a 2019 snapshot of Australian and state government investment in food waste reduction activities (not including organics collection) mapped against the section of the value chain to which it relates. Current indications are that most Australian Government funding is being directed towards primary production, manufacturing and retail food waste, largely due to matching industry funding requirements (not included in the below table), while hospitality and food service and consumer food waste funding initiatives are largely state funded.

Please note that amounts shown are total standing commitments over various time frames.

Primary Production	Manufacturing & Retail	Hospitality & Food Service	Household
2,270 kT p.a.	2,017 kT p.a.	533 kT p.a.	2,500 kT p.a.
\$1.37 million by Australian Government Department of Environment to establish the National Food Waste Strategy Roadmap, undertake the baseline study and establish a Voluntary Commitment with industry.			
<p>Current funding \$18 million</p> <p>Rural Research & Development Corporations (RDC) through the Rural Research & Development for Profit Program</p>	<p>Current funding est \$1 million</p> <p>Sustainability Advantage Program in Victoria & Brisbane</p>	<p>Current funding \$2-3 million</p> <p>Your Business is Food program in New South Wales Make Food Waste Your Business in Victoria</p>	<p>Current funding 1. \$7.5 million, 2. \$0.5 million</p> <p>1. Love Food Hate Waste program in New South Wales, Victoria & Brisbane</p> <p>2. Understanding consumer food waste attitudes & behaviours, Fight Food Waste CRC</p>
<i>Source – Australian Government- Department of Agriculture</i>	<i>Source – Sustainability Victoria</i>	<i>Source – NSW EPA, Sustainability Victoria</i>	<i>Source – NSW EPA, Sustainability Victoria, Fight Food Waste CRC</i>

Indicative allocation of \$30 million Federal funding within Fight Food Waste Cooperative Research Centre (FFW CRC) to match industry investment



Source – Australian Government Department of Industry, Innovation and Science CRC Program

Our Challenges

As outlined in the previous sections, the Fight Food Waste CRC is strongly aligned to key international and national food waste organisations and strategies. This will assist the organisation to maximise the use of its resources. Notwithstanding, the organisation faces many challenges in delivering the Grant Agreement and Future Initiatives outlined in this document. They include:

- Any Cooperative Research Centre is only as good as its participants and the withdrawal of major core participants can have a significant impact on the ability of the organisation to deliver. Ensuring the ongoing support of our participants is the basis of the Board-endorsed Participant Engagement Framework that is currently being rolled out.
- The organisation has been funded for 10 years and has a large number of participants to manage, many with low levels of contribution. Maintaining interest levels, momentum and continually delivering on participant expectations over this long period will be both a challenge and an opportunity.
- While the Australian Government has made a commitment to halve food waste by 2030, a change in government priorities could see support for the NFWS withdrawn. Working closely with the Australian Government and state governments and industry to track our collective progress towards achieving SDG 12.3 will hopefully keep everyone on track.
- The organisation lacks participation from large food and packaging companies, food service companies and waste management companies that are currently responsible for generating and managing large amounts of food waste. This is a situation that we plan to rectify through future initiatives as well as our involvement in the NFWS.
- The organisation currently has low levels of involvement from the Rural Research and Development Corporations (RDC's), as no one RDC has responsibility for food waste. Developing future initiatives with specific RDC's will be integral.
- There is currently an imbalance in funding between the REDUCE (20%), TRANSFORM (60%) and ENGAGE (20%) programs, which largely reflects participant RD&E interests. Notwithstanding, it is generally recognised that higher levels of impact on reducing food waste can be achieved through avoiding its generation in the first place (REDUCE) and through changing industry and consumer behaviour to make food waste unacceptable (ENGAGE). Attracting new funding to the REDUCE and ENGAGE programs is a key objective for the Fight Food Waste CRC Management team.
- There are some important industry-wide legacy outputs of the current Grant Agreement that are underfunded, such as the development of decision support tools for industry in the TRANSFORM program. These will be the target of future funding initiatives.
- Food waste is still seen as a cost not as an opportunity by many in industry and government. Promoting international return on investment studies will help address this.
- The organisation is reliant on a small group of skilled, committed and passionate staff, whereby departures will greatly affect its ability to deliver. We are committed to making the organisation a workplace of choice for salaried and in-kind staff to assist in staff retention.

The Fight Food Waste CRC has developed an extensive risk management policy and register to manage such risks, which will be reviewed regularly by the Audit and Risk Management Committee and updated at least annually.

Strategic Objectives



An Overview

The Fight Food Waste CRC brings together industry, research and the community to capitalise on Australia's food waste opportunities. Winning this fight could save Australia \$20 billion per annum while increasing industry profitability and reducing food insecurity, as well as enhancing Australia's reputation as a sustainable producer of premium food products.

The overarching strategic objectives of the Fight Food Waste CRC are to deliver:

- a transformation in the way Australian industry and consumers view food waste as well as contribute to food rescue
- a suite of new tools and technologies for extracting the maximum value out of primary production, food manufacturing, supply chains and product sales, whether through supply chain innovation or waste transformation
- reduction in food waste entering landfill and associated greenhouse gas emissions
- future industry professionals skilled in capturing opportunities identified by industry.



The Fight Food Waste CRC will achieve its purpose through three main research, development and extension programs. The programs were defined and refined during the development of the Fight Food Waste CRC Full Business Case in 2017. They are:



REDUCE food waste throughout the supply chain by:

- delivering supply chain analysis tools
- developing a framework for optimal packaging design
- innovative supply chain and packaging solutions
- identifying options to optimise food rescue.



TRANSFORM unavoidable waste into innovative products by:

- identifying and prioritising commercially valuable products from waste streams
- developing new technologies for waste transformation
- decision support tools
- identifying regulatory options to promote



ENGAGE with industry and consumers to deliver behavioural change by:

- educating future industry professionals
- industry dissemination and skills training
- facilitating household and business behaviour change.

Presented on the following pages is a detailed description of what each program hopes to achieve by 2028, our current completion date. Strategic objectives will be separated into two key actions:

Deliver the Grant Agreement

We will first establish our initial 30-project research, development and extension program based on the best science and expertise with our existing participants. We will then develop and deliver new projects with existing and new participants that ensures we effectively deliver on all Grant Agreement performance milestones.

Deliver Future Initiatives

We will identify and target additional food loss and waste opportunities based on the NFWB and other key reports that will deliver significant food waste reduction and industry benefits to help achieve SDG 12.3. Additionally, we will scope and potentially develop a 10-year national behaviour change program that targets the entire food system, particularly consumers, with the Australian and state and territory governments and industry that reduces and prevents food waste from entering landfill.

REDUCE Strategic Objectives





REDUCE Overview

The **REDUCE** program will deliver research and development that reduces food losses and waste across the supply chain. At the core of the program is the knowledge that the most efficient way to address food waste is to prevent it from occurring in the first place. The initial research portfolio maps across all the stated program impacts, which is important in establishing a strong foundation on which to build success across the life of the Fight Food Waste CRC.

To this end, one key focus is on developing the decision-support tools that enable organisations and their supply chains to understand where, how and why waste is occurring. Knowing the causes of waste will empower individuals to take meaningful action. For this reason, the first program activity is focussed on mapping; the development of decision support tools, like DIRECT, providing the foundations and systems for this to occur.

In addition to this, the protection and safe supply of food requires the design of product packaging systems to ensure that food is protected from damage and maintains its quality to the point of consumption. Consumers have a complicated relationship with food packaging and our activities will also focus on understanding this interaction better. The Save Food Packaging Criteria and Framework and Consumer perceptions of the role of packaging in reducing food waste will address these by enhancing collaboration among supply chain partners working together to address specific challenges and opportunities in reducing food waste.

The diversity of food waste challenges that exist across supply chains means the opportunity for the REDUCE program to work closely with partners to delve deeper is critical in identifying opportunities that will make a difference. The initial portfolio brings in industry sectors encompassing abalone, prawns, and bananas, working to address specific issues including processing improvements, shelf life, cold chain management, ensuring that decisions made in one part of the supply chain do not result in negative impacts somewhere else.

The second tier of the food waste hierarchy is 'food rescue – food donation' to divert food to those facing food insecurity. The final activity of the program is understanding the role of redirecting surplus food through a food security and hunger lens that will ensure food goes to those in need. Foodbank Australia has identified stakeholder engagement (donor organisations and volunteers) as an important element to its operations to enhance understanding, in addition to exploring the opportunities technology brings with the Y Waste app.

The protection and safe supply of food requires the design of product packaging systems to ensure that food is protected from damage and maintains its quality to the point of consumption.

With strong foundations in place, there are many more opportunities to explore. The Fight Food Waste CRC is the ideal platform to undertake future research into the NFWB data, building upon the work commissioned by the Australian Government Department of Environment and Energy (2018-2019). Discussions are currently underway with the Department, FIAL and the NFWS Implementation Committee regarding this. There are also opportunities to collaborate with international partners around data protocols, standards and systems.

Expanding the representation across all key food categories – meat, vegetables, fruit, dairy and other seafood - will be important in developing the program in the coming years. In addition, expanding to have the food service and hospitality sector active within the Fight Food Waste CRC and understanding their distinct opportunities to reduce food waste.

By the completion of the program Australian food businesses will have embraced the issue of actively addressing the lost financial, social and environmental resources associated with food waste. With good data informing good practice across the supply chain we can achieve the stated program impacts, as well as a reduction in food waste against SDG 12.3.

Expanding the representation across all key food categories – meat, vegetables, fruit, dairy and other seafood - will be important in developing the program in the coming years.





Grant Agreement Key Activities - Output 1

Output	Milestone	Relevant Project(s)	
<p>Output 1 - Supply chain analysis tools</p> <p>Identification of key data requirements and sources of data; design and develop data collection system models; analysis of the supply chain identifying resource flows, losses and route cause analysis; cold chain analysis at critical control points; diagnostic tools to measure cost of production inputs used in production of products that are rejected for sale.</p>	<p>Key data sources identified. Data collection methodologies reviewed. Internal business data systems identified. Data collection system (1.1)</p>	<p>1.1.1 DIRECT online 1.3.1 On-board processing and packaging innovation in the Australian wild harvest prawn fishery 1.3.2 Supply chain monitoring and improvement to reduce banana quality loss National Food Waste Baseline study</p>	
	<p>Use of the data collection system models and benchmark metrics piloted with interested parties (1.2)</p>	<p>1.1.1 DIRECT online 1.3.1 On-board processing and packaging innovation in the Australian wild harvest prawn fishery</p>	
	<p>Resource flows, mapping and route cause analysis compiled for selected seafood, horticulture and food donation supply chains and products. Outcomes embedded into at least five organisations. Data systems refined (1.3)</p>	<p>1.1.1 DIRECT online 1.2.3 Packaging and processing machinery 1.3.1 On-board processing and packaging innovation in the Australian wild harvest prawn fishery</p>	
	<p>Analyse data and develop new insights; Benchmark metrics released (1.4)</p>	<p>1.1.1 DIRECT online 1.3.1 On-board processing and packaging innovation in the Australian wild harvest prawn fishery New projects to be identified</p>	
	<p>Pilots, data systems, model and benchmarking metrics reviewed and evaluated. Outcomes embedded into at least 20 additional organisations. Benchmarks released (1.5)</p>	<p>1.1.1 DIRECT online New projects to be identified</p>	
	<p>Data models and metric modified and enhanced based upon feedback and pilot reviews; sector benchmark metrics released. Data modelling expanded into new sectors/supply chains (1.6)</p>	<p>1.1.1 DIRECT online New projects to be identified</p>	
	<p>A robust data collection system, benchmark metrics and resource efficiency models delivered (1.7)</p>	<p>1.1.1 DIRECT online New projects to be identified</p>	
	<p>Year 1 - 3</p>		
	<p>Years 4 - 6</p>		
<p>Years 7-10</p>			



Grant Agreement Key Activities - Output 2

Output	Milestone	Relevant Project(s)
<p>Output 2 – Framework for optimal packaging design</p> <p>Framework for packaging design, food safety, food quality, date labelling and shelf life features; database of producer, processor, manufacturer and retailer insights; database of customer perceptions, insights and acceptance of packaging, design guidelines for supply chain, including on how to educate consumers on the value of packaging.</p>	<p>Design guidelines and frameworks reviewed to consider role of packaging saving food, food safety, food quality, date labelling and shelf life and assemble packaging design features (1.8)</p>	<p>1.2.1 Save food packaging criteria and framework 1.2.3 Packaging and processing machinery</p>
	<p>Insights of packaging functions and design features assembled; industry case studies compiled; consolidated guidelines drafted and piloted (1.9)</p>	<p>1.2.1 Save food packaging criteria and framework 1.2.2 Consumer perceptions of the role of packaging in reducing food waste 1.2.3 Packaging and processing machinery</p>
	<p>Australian and overseas consumer perceptions and understanding of packaging reviewed; consumer study regarding perceptions and understanding of packaging designed and conducted (1.10)</p>	<p>1.2.2 Consumer perceptions of the role of packaging in reducing food waste</p>
	<p>Consumer study insights analysed; pilot use of packaging guidelines reviewed and implemented into New Product Development (NPD) processes (1.11)</p>	<p>1.2.1 Save food packaging criteria and framework New projects to be identified</p>
	<p>Refined packaging design guidelines and frameworks released; insights from consumer study and packaging perceptions released (1.12)</p>	<p>1.2.1 Save food packaging criteria and framework New projects to be identified</p>
	<p>Continuation of assembling and sharing industry case studies; guidelines embedded into NPD processes; consumer perceptions database built upon (1.13)</p>	<p>1.2.1 Save food packaging criteria and framework New projects to be identified</p>
	<p>Updated consolidated packaging design guidelines and frameworks delivered; industry case studies & consumer database expanded (1.14)</p>	<p>1.2.1 Save food packaging criteria and framework New projects to be identified</p>
	<p>Year 1 - 3</p>	
<p>Years 4 - 6</p>		
<p>Years 7-10</p>		



Grant Agreement Key Activities - Output 3

Output	Milestone	Relevant Project(s)
<p>Output 3 – Innovative supply chain and packaging solutions</p> <p>Map of current product-packaging and supply chain and causes of loss; review of issues and opportunities; best practice guidelines for innovative packaging solutions; processing and machinima requirements; Life Cycle Assessment (LCA) of options; new lower cost packaging materials that are more effective at maintaining freshness.</p>		<p>1.1.1 DIRECT online</p> <p>1.2.3 Packaging and processing machinery</p> <p>1.3.1 On-board processing and packaging innovation in the Australian wild harvest prawn fishery</p> <p>1.3.2 Supply chain monitoring and improvement to reduce banana quality loss</p>
	<p>Year 1 - 3</p> <p>Applicability/feasibility of new and emerging processing and packaging (including cost, performance, food safety, consumer acceptance) researched (1.16)</p>	<p>1.2.3 Packaging and processing machinery</p> <p>1.3.1 On-board processing and packaging innovation in the Australian wild harvest prawn fishery</p> <p>1.3.2 Supply chain monitoring and improvement to reduce banana quality loss</p> <p>1.3.3 Reducing canning losses in the abalone industry</p> <p>1.3.5 New food transport carton</p>
	<p>Whole of supply chain pilot testing undertaken and monitored with new packaging and processing options for each targeted product (1.17)</p>	<p>1.3.1 On-board processing and packaging innovation in the Australian wild harvest prawn fishery</p> <p>1.3.2 Supply chain monitoring and improvement to reduce banana quality loss</p>
	<p>Years 4 - 6</p> <p>LCA assessment of identified alternatives/modifications undertaken and compared against existing product-packaging systems and supply chains (1.18)</p>	<p>1.3.2 Supply chain monitoring and improvement to reduce banana quality loss</p>
	<p>Performance testing undertaken; cost benefit/logistical/feasibility assessment of scale-up and implementation completed; stakeholders and end-users consumers consulted (1.19)</p>	<p>New projects to be identified</p>
	<p>Years 7-10</p> <p>Review of the product-packaging pilots, assessments, performance testing, and stakeholder engagement. Finalise and deliver the product-packaging solutions for the identified products (1.20)</p>	<p>New projects to be identified</p>



Grant Agreement Key Activities - Output 4

Output		Milestone	Relevant Project(s)
<p>Output 4 – Options to optimise food rescue</p> <p>Develop iFoodRescue app to improve effectiveness of existing centralised food rescue operations; provision of annual survey of food rescue activities in Australia to measure amount and types of food rescued; food safety handling guidance document; undertake tax policy analysis (enhanced tax deductions for food donations and transport of donated goods).</p>	<p>Year 1 - 3</p>	<p>Scan food rescue operations to identify opportunities for technology to improve efficiency and increase volumes (eg. iFoodRescue app) (1.21)</p>	<p>1.4.2 Foodbank Meals Via Y Waste App</p>
		<p>Develop prototype technologies for selected opportunities (1.22)</p>	<p>1.4.2 Foodbank Meals Via Y Waste App</p>
		<p>Publication of food rescue/hunger report on annual basis (1.23)</p>	<p>1.4.1 Enhancing Foodbank's stakeholder engagement</p>
	<p>Years 4 - 6</p>	<p>Develop policy case for change in taxation to facilitate donation of transport services for rescuing food: identify funding partners and provide report (1.24)</p>	<p>New projects to be identified</p>
		<p>Develop policy case for changes in taxation to facilitate donation of food to food rescue: identify funding partners and provide report (1.25)</p>	<p>New projects to be identified</p>



Key Outcomes and Impact

The outputs of this program will enable industry to seamlessly map its resource and waste flows, capture the reasons why loss in the supply chain occurs, reduce those losses through improved packaging and cold chain management of product, extend shelf life, and add value.

The outcomes expected by our industry partners are:

- \$2.2B in sales (NPV = \$1.4B, risk adjusted NPV = \$0.4B)
- longer shelf life for food products
- ability to access new markets for Australian food
- lower volumes of food wastage
- less packaging in landfill
- more efficient supply-chain management practice
- increased exports of packaging technologies
- 6M kg pa of rescued food distributed
- welfare agencies supported
- reduction in number of hungry people turned away from welfare agencies
- \$136M pa Social Return on Investment: health & education, GHG reduction, landfill cost
- improved OHS&W when automation replaces manual packing
- better understanding by the consumer of the role of packaging in reducing food waste.

Indicative Budget and Staff Alloca-

	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
Cash (\$'000)	887	1,567	1,377	1,301	1,299	1,299	1,285	1,280	1,280	1,028
Non-staff In-kind (\$'000)	236	237	236	217	213	213	213	213	213	213
Staff In-kind (FTE)	4	4	4	3	3	3	3	3	3	3

Benefit/Cost Analysis

The Fight Food Waste CRC REDUCE program expects to deliver **\$403 million** in benefits to Australian society. The program will cost **\$24 million** to deliver and require an additional expenditure for usage of outputs of **\$53 million**.

Expected benefit to cost ratio: 5.3:1



Future Initiatives

The Fight Food Waste CRC is an RD&E organisation and all future activities must be developed through this lens. Additionally, all projects within the Fight Food Waste CRC must involve at least one industry or government partner and one research provider.

Below is a list of REDUCE future initiatives that go beyond the existing Grant Agreement milestones. They have been compiled from previous Fight Food Waste CRC Management Team discussions as well as modified from various written sources, including recent Champions 12.3, World Resources Institute, WRAP and ReFED reports and Sarah May's Churchill Fellowship Final Report (see Further Reading list).

Primary Production

- Utilise plant breeding and genetics, including the use of anti-browning technologies, to increase the shelf life of perishable foods.
- Development of supply-demand forecasting/predictive ordering models and apps to enhance supplier agreements and avoid unfair trading practices.
- Undertake research to improve horticulture harvesting techniques to reduce damage of produce.
- Identify methods to minimise bycatch in fisheries, as well as ways to utilise unavoidable bycatch.
- Identify methods to improve livestock animal welfare to avoid stress which can reduce shelf life of meat.

Manufacturing

- Deliver innovative tools and technologies to preserve food quality and extend shelf life.
- Assist food manufacturers to optimise their manufacturing lines to avoid food waste, particular during product line changes.

Packaging

- Research and develop a universally accepted 'Foodie Bag' (doggy bag) to promote and normalise the utilisation of restaurant and catering leftovers.
- Work with food manufacturers to improve food storage information on packaging.

- Define the costs and benefits of adopting Smart and Intelligent packaging in Australia and highlight barriers to adoption.

Retail and Hospitality

- Collaborate with retailers and their customers to understand the costs and benefits of relaxing horticulture specifications.
- Make food waste management plans mandatory for all Fight Food Waste CRC and government workshops and conferences.
- Work with restaurants and food service providers to adopt waste tracking & analytics across all facilities.
- Assist institutions such as hospitals, prisons, age care facilities and schools to understand the benefits of circular food economy websites and services.

Whole of supply chain

- Development of a National Food Loss and Waste index based on the DIRECT tool that monitors Australia's performance against SDG 12.3 in real time.
- Assist NFWS Voluntary Commitment signatories to TARGET, MEASURE and ACT on food waste.
- Research novel ways to increase food donation and rescue including better use of existing infrastructure and distribution nodes.
- Develop and implement technology to reduce the time food spends in transit.
- Assess shelf life reduction and food waste related to breakdowns in the cold chain in Australia and determine ways that they can be reduced.
- Investigate the relationship between organic landfill costs and reducing food waste going into landfill.

Policy

- Undertake research on standardising date labelling in Australia to reduce food waste.

TRANSFORM Strategic Objectives





TRANSFORM Overview

The **TRANSFORM** program is the largest program within the Fight Food Waste CRC in terms of the number of projects and monetary investment. Critical to the long-term success of the Fight Food Waste CRC is creating a mechanism where industry participants can create outcomes of commercial value that they could not achieve on their own. This will be achieved through the development of new and unique collaborations amongst stakeholders.

The TRANSFORM program will predominantly work with the primary production agribusiness companies as well as end users of food waste, such as composters and bioenergy companies. The agribusiness sectors within Australia is valued at \$282 billion and involves over 179,000 companies employing over 630,000 people. It is our intent to re-value 'waste' into a resource within the sector and drive change in industry practices. We will do this through working with progressive companies to provide examples of leadership in addressing food waste through innovation.

The successful implementation of innovations across these many sectors, and the economic benefits of new products and processes in these industries, will drive the uptake of food waste reduction practices within Australia.

Many current projects in the TRANSFORM program are driven by product development for existing markets within Australia. This can be seen by the high number of projects falling under each key activity in the below tables. These projects will provide a range of benefits to Australian industry and will result in immediate reduction in food loss and waste. However, driving long-term change in Australian industry requires long-term investment in transformative technologies, not just new products. To achieve this, we will develop new projects to identify technology gaps and processing limitations in waste transformation, then innovations to fill those gaps. To implement lasting change, we must engage with the policy environment around food waste and address some of the regulatory problems in our economy that create waste. For this program, this will mean specifically looking at the socio-economic benefits of alternative policy settings to reduce food waste.

The successful implementation of innovations across these many sectors, and the economic benefits of new products and processes in these industries, will drive the uptake of food waste reduction practices within Australia

Success in 2028 will be visible at every stage in the supply chain. On the farm, you will see a more complete harvest, where the whole crop is utilised and transported from the farm. Post-harvest will see a greatly increased demand for all grades of produce, with far more processing options available for food products.

Processing sites for food products will have moved to zero waste practices, with no food material going to landfill. Distribution will have changed so that not only will there be outward-bound product to consumers, but there will be channels for return of unused product to be reused in other processes that will retain the value of the food product for human consumption for as long as possible. HACCP Management Systems for food safety will extend to cover both the outgoing and returning value chains, in addition to reprocessing sites. Food services and household products and processes will be built with zero organic waste in mind, personalisation of portion sizes, source separation, and additional services for the collection of organic waste are all examples of changes this program will deliver to address food waste in Australia.



Grant Agreement Key Activities - Output 1

Output	Milestone	Relevant Project(s)
<p>Output 1 - Commercially valuable products from waste</p> <p>Identification of high-value products from different waste streams (such as bioactives, new industrial products, animal feeds, soil amendments, fuels); investigate food safety and integrity aspects of new products; development of product specifications; identification of technology gaps and process limitations; market analysis that explicitly acknowledges the cost of travel and distance; process optimisation</p>	<p>Existing waste streams relevant to partner organisations surveyed, including SEQId, South Australian and Victorian regional horticultural produce. Market opportunities and food safety hazards identified. Near-market opportunities reviewed (2.1)</p>	<p>2.1.1 Unlocking value from waste and surplus horticultural produce 2.1.2 Sandalwood nut transformation 2.1.4 Making ACC circular 2.1.5 Converting potato waste into pre-biotics and other valuable products 2.1.6 Grape seed extract 2.2.1 Valorising composts 2.2.3 Food waste to animal feed 2.3.2 Waste-to-Energy: fuelling sustainable wastewater treatment with food waste 2.4.1 Transforming food waste into a regional economic benefit</p>
	<p>Initial proof of concept testing for new solutions completed. Intellectual property for new product solutions registered (2.2)</p>	<p>2.1.1 Unlocking value from waste and surplus horticultural produce 2.1.2 Sandalwood nut transformation 2.1.5 Converting potato waste into pre-biotics and other valuable products 2.2.1 Valorising composts 2.2.2 Karma3 nutrient recycling system 2.2.3 Food waste to animal feed 2.3.1 Fight Food Waste SME Solutions Centre 2.3.2 Waste-to-Energy: fuelling sustainable wastewater treatment with food waste</p>
	<p>Further waste streams relevant to partner organisations surveyed for both known and novel products. Further market opportunities and food safety hazards identified and reviewed. Intellectual property for new product solutions registered (2.3)</p>	<p>2.1.1 Unlocking value from waste and surplus horticultural produce 2.1.2 Sandalwood nut transformation 2.1.5 Converting potato waste into pre-biotics and other valuable products 2.2.3 Food waste to animal feed 2.3.2 Waste-to-Energy: fuelling sustainable wastewater treatment with food waste 2.4.1 Transforming food waste into a regional economic benefit</p>



Grant Agreement Key Activities - Output 1

Output	Milestone	Relevant Project(s)
<p>Output 1 - Commercially valuable products from waste</p> <p>Identification of high-value products from different waste streams (such as bioactives, new industrial products, animal feeds, soil amendments, fuels); investigate food safety and integrity aspects of new products; development of product specifications; identification of technology gaps and process limitations; market analysis that explicitly acknowledges the cost of travel and distance; process optimisation</p>	<p>Rapid screening protocols developed and used to identify further novel products. Additional waste streams relevant to partner organisations identified and surveyed for both known and novel products. Further market opportunities and food safety hazards identified and reviewed. Intellectual property for new product solutions registered (2.4)</p>	<p>2.1.1 Unlocking value from waste and surplus horticultural produce 2.2.3 Food waste to animal feed New projects to be identified</p>
	<p>Iterative proof of concept testing and business case development for new solutions completed. Intellectual property for new product solutions registered (2.5)</p>	<p>2.1.1 Unlocking value from waste and surplus horticultural produce New projects to be identified</p>
	<p>Future product roadmap developed (2.6)</p>	<p>2.1.1 Unlocking value from waste and surplus horticultural produce New projects to be identified</p>



Grant Agreement Key Activities - Output 2

Output	Milestone	Relevant Project(s)
<p>Output 2 - Commercial prototype technologies for waste transformation</p> <p>Identification of technology gaps and process limitations; product specifications for required technologies; optimisation of existing technologies; design and prototyping of new technologies to process waste streams; commissioning of fully functional and modular “plug and play” technologies in demonstration facilities.</p>	<p>Technology needs for different waste streams and products reviewed. Existing technologies surveyed. Market opportunities for technologies identified (2.7)</p>	<p>2.1.1 Unlocking value from waste and surplus horticultural produce 2.1.2 Sandalwood nut transformation 2.1.6 Grape seed extract 2.2.1 Valorising composts 2.2.2 Karma3 nutrient recycling system 2.3.1 Fight Food Waste SME Solutions Centre 2.3.2 Waste-to-Energy: fuelling sustainable wastewater treatment with food waste 2.4.1 Transforming food waste into a regional economic benefit</p>
	<p>New conceptual solutions for modular technologies developed and initial proof of concept testing completed (2.8)</p>	<p>2.1.1 Unlocking value from waste and surplus horticultural produce 2.1.2 Sandalwood nut transformation + truffle products value-adding and shelf-life extension 2.2.2 Karma3 nutrient recycling system 2.2.3 Food waste to animal feed 2.3.1 Fight Food Waste SME Solutions Centre 2.3.2 Waste-to-Energy: fuelling sustainable wastewater treatment with food waste</p>
	<p>Further full-scale review of new technology gaps across all project partners conducted and technology needs identified. New conceptual solutions for modular technologies developed and proof of concept testing completed. Intellectual property for new product solutions registered (2.9)</p>	<p>2.3.2 Waste-to-Energy: fuelling sustainable wastewater treatment with food waste 2.4.1 Transforming food waste into a regional economic benefit</p>



Grant Agreement Key Activities - Output 2

Output	Milestone	Relevant Project(s)	
<p>Output 2 - Commercial prototype technologies for waste transformation Identification of technology gaps and process limitations; product specifications for required technologies; optimisation of existing technologies; design and prototyping of new technologies to process waste streams; commissioning of fully functional and modular “plug and play” technologies in demonstration facilities.</p>	<p>Year 7-10</p>	<p>Establishment of demonstration facilities in selected regions of relevance to the project partners (2.10)</p>	<p>New projects to be identified</p>
		<p>Iterative proof of concept testing for new solutions completed. Intellectual property for new product solutions registered (2.11)</p>	<p>New projects to be identified</p>
		<p>Future technology roadmap delivered (2.12)</p>	<p>New projects to be identified</p>



Grant Agreement Key Activities - Output 3

Output	Milestone	Relevant Project(s)
<p>Output 3 - Framework to optimise viability of technology and waste input combinations</p> <p>Collect data on waste composition, hazards and volumes; process engineering models; economic and business analysis and identification of profitable business models; toolkit for optimising the choice of technology and waste combinations.</p>	<p>Year 1 - 3</p> <p>Initial data set collated on waste composition, potential hazards and volumes relevant to partner organisations. Review of available relevant technologies delivered to partner organisations. Protocols developed and circulated (2.13)</p>	<p>1.1.1 DIRECTonline</p> <p>2.1.1 Unlocking value from waste and surplus horticultural produce</p> <p>2.1.2 Sandalwood nut transformation</p> <p>2.1.4 Making ACC circular</p> <p>2.1.5 Converting potato waste into pre-biotics and other valuable products</p> <p>2.1.6 Grape seed extract</p> <p>2.2.1 Karma3 nutrient recycling system</p> <p>2.2.3 Food waste to animal feed</p> <p>2.3.2 Waste-to-Energy: fuelling sustainable wastewater treatment with food waste</p> <p>2.4.1 Transforming food waste into a regional economic benefit</p>
	<p>Process engineering models delivered and validated for each key technology type (2.14)</p>	<p>2.2.2 Karma3 nutrient recycling system</p> <p>2.2.3 Food waste to animal feed</p> <p>2.3.2 Waste-to-Energy: fuelling sustainable wastewater treatment with food waste</p>
	<p>Years 4 - 6</p> <p>Techno-economic analysis of feed product/process combinations delivered for project regions (2.15)</p>	<p>2.1.1 Unlocking value from waste and surplus horticultural produce</p> <p>2.1.2 Sandalwood nut transformation</p> <p>2.1.5 Converting potato waste into pre-biotics and other valuable products</p> <p>2.3.2 Waste-to-Energy: fuelling sustainable wastewater treatment with food waste</p> <p>2.4.1 Transforming food waste into a regional economic benefit</p>
	<p>Updated data set on waste composition and volumes and product markets relevant to partner organisations compiled; Sector focussed state-of-the-art technology review completed; Process models for state-of-the-art technology delivered (2.16)</p>	<p>1.1.1 DIRECTonline</p> <p>2.1.1 Unlocking value from waste and surplus horticultural produce</p> <p>2.1.5 Converting potato waste into pre-biotics and other valuable products</p>



Grant Agreement Key Activities - Output 3

Output		Milestone	Relevant Project(s)
<p>Output 3 - Framework to optimise viability of technology and waste input combination</p> <p>Collect data on waste composition, hazards and volumes; process engineering models; economic and business analysis and identification of profitable business models; toolkit for optimising the choice of technology and waste combinations.</p>	<p>Year 7-10</p>	<p>Models of optimal feed/technology combinations delivered for selected regions relevant to partner organisations; protocols delivered for consistent techno-economic analysis (2.17)</p>	<p>2.1.1 Unlocking value from waste and surplus horticultural produce New projects to be identified</p>
		<p>Updated data set on waste and product markets relevant to partner organisations delivered; sector focussed state-of-the-art technology review updated. Models of optimal feed/product/technology combinations delivered for largescale integrated market opportunities (2.18)</p>	<p>2.1.1 Unlocking value from waste and surplus horticultural produce New projects to be identified</p>
		<p>Methodology toolkit for optimising the combination of feedstocks and technologies delivered (2.19)</p>	<p>2.1.1 Unlocking value from waste and surplus horticultural produce New projects to be identified</p>



Grant Agreement Key Activities - Output 4

Output	Milestone	Relevant Project(s)	
<p>Output 4 - Regulatory options to promote investment in waste transformation</p> <p>Review of policies that currently inhibit investment in waste transformation technologies (such as zoning, use of insect protein as a fish feed, carbon credits for various diversions of waste from landfill, excise rebate for renewable diesel); socio-economic assessment of alternative policy settings and risk profiling to identify new hazards.</p>	<p>Year 1 - 3</p>	<p>Initial review of existing policy and legislation in food waste transformation complete. Stakeholder survey to identify investment barriers for producers conducted (2.20)</p>	<p>2.1.5 Converting potato waste into pre-biotics and other valuable products 2.2.1 Valorising composts 2.2.2 Karma3 nutrient recycling system 2.2.3 Food waste to animal feed</p>
		<p>Initial review identifying regulatory barriers and policy settings that limit investment opportunities for producers delivered (2.21)</p>	<p>2.2.1 Valorising composts 2.2.2 Karma3 nutrient recycling system 2.2.3 Food waste to animal feed 2.3.2 Waste-to-Energy: fuelling sustainable wastewater treatment with food waste</p>
	<p>Years 4 - 6</p>	<p>Socioeconomic assessment to identify impacts of alternative policy frameworks completed. Alternative policies prepared, circulated and promoted to relevant government departments and agencies (2.22)</p>	<p>2.2.2 Karma3 nutrient recycling system 2.2.3 Food waste to animal feed</p>
		<p>Updated stakeholder survey conducted to again identify market barriers for producers given emerging technologies and markets (2.23)</p>	<p>New projects to be identified</p>
	<p>Years 7 - 10</p>	<p>New review delivered identifying regulatory barriers and policy settings that limit market access for producers (2.24)</p>	<p>New projects to be identified</p>
		<p>Further socioeconomic assessment undertaken to identify impacts of alternative policy frameworks. Further reports to form the basis of advice to relevant government departments on alternative policies prepared (2.25)</p>	<p>New projects to be identified</p>
		<p>Final review prepared outlining perceived future risks and barriers for producers in existing policy settings (2.26)</p>	<p>New projects to be identified</p>



Key Outcomes and Impact

The outcomes expected by our industry partners are:

- \$4.7B in sales (NPV = \$2.8B, risk adjusted NPV = 1.9B)
- health benefits from bioactives
- at least 87 GL of water savings through recovery and reuse
- at least 30 M tonnes in reduced food waste
- 5,200 jobs (direct and indirect), most in rural areas
- \$600M reduction of waste produce and waste handling costs
- a saving of at least 44 M tonnes of GHG emitted over 10 years.

Indicative Budget and Staff Allocation

	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
Cash (\$'000)	2,661	4,700	4,131	3,903	3,897	3,896	3,854	3,839	3,839	3,084
Non-staff In-kind (\$'000)	709	710	708	650	639	639	639	639	639	639
Staff In-kind (FTE)	12	12	12	10	10	10	10	10	10	10

Benefit/Cost Analysis

The Fight Food Waste CRC expects to deliver **\$2.0 billion** in benefits to Australian society from the TRANSFORM program. The program will cost **\$56 million** to deliver, and will require additional expenditure for usage of outputs of **\$376 million**.

Expected benefit to cost ratio: 4.6:1



Future Initiatives

Below is a list of potential **TRANSFORM** initiatives that go beyond the existing Grant Agreement milestones listed above:

Primary Production

- The largest food losses in Australia occur in horticulture. Most of the initial horticulture work within the Fight Food Waste CRC is targeting wine grapes (grape marc), potatoes, oranges and tomatoes, which have been identified as the crops with the largest annual losses in Australia.^{11,12} Other horticulture crops where large amounts of production and packhouse losses occur are apples, pineapple, mango, melons/watermelon, cabbage, cauliflower, cucumber and sweet potato.
- Sugar cane in Queensland has the largest losses of any crop (over 400,000 tonnes p.a.) and requires additional research attention into valorisation options besides bioenergy.

Manufacturing

- Dairy has been identified as the food manufacturing sector with the highest food losses in the NFWS (629,200 tonnes), mostly in Victoria. Delivering transformation options for smaller dairy companies should be a future research focus area.
- While the primary production of cereals is one of the lowest sources of food loss, the downstream processing steps that apply to cereals crops such as milling, pressing, baked goods, brewed products, and additives in food manufacturing all generate significant losses and secondary material streams that present product opportunities for the TRANSFORM program.

Retail and Hospitality

- While wholesale food losses are minor (0.4% of overall waste), fish and seafood wholesale losses account for nearly half this and should be examined further to identify both reduction and transformation options as currently it all goes to landfill.

- Hospitality and food service (including institutions) are currently generating over 530,000 tonnes of food waste per annum with nearly all of it going to landfill. Takeaway food, cafes & restaurants, aged care facilities and primary schools are reported to be the biggest generators. Transformation options, such as conversion to treated animal feed, will be essential if Australia is to meet SDG 12.3.
- Examine the cost/benefit of in-store valorisation options for imperfect/sub-prime horticulture produce, such as fresh cuts, soups and juices.

Household

- With over 2.5 M tonnes of household food waste reported each year by the NFWS, and 92% still going to landfill, biomaterial/processing transformation options that could contribute to Australia's SDG 12.3 target should remain the Fight Food Waste CRC's R&D 'holy grail'. Currently 8% of household food waste goes to composting, which while keeping food waste out of landfill, does not contribute to SDG 12.3

Whole of supply chain

- Develop a national food waste to treated animal feed program in Australia. Currently Australia diverts 35% of surplus human food into animal feed, where Japan now transforms over 50% of food waste into treated liquid and pelleted animal feeds.

Policy

- Examine transport licencing requirements related to retail food waste to enable aggregation of food waste back to distribution centres for centralised collection and utilisation (backhauling).

¹¹ Arcadis (2019) National Food Waste Baseline, Final Assessment Report.
¹²CSIRO (2019) Mapping of Australian fruit and vegetables losses pre-retail.

ENGAGE Strategic Objectives





ENGAGE Overview

The **ENGAGE** program will, as its name suggests, engage with industry and consumers to create change. If the Fight Food Waste CRC is to be successful in implementing profitable innovations in Australian businesses, then critical to this is building a stronger appreciation for the value of food across the entire supply chain.

The ENGAGE program aims to recruit and retain the best and most motivated students for its Future Leaders Program who want to contribute to the food and agribusiness sector. To this end, the Fight Food Waste CRC has devoted significant resources to develop future leaders in the area of food waste. These leaders of tomorrow will undertake research on industry defined problems whilst embedded within an industry participant, and will subsequently be in a position to contribute to building capacity within businesses to drive on-going commercial innovation. Over 10 years Fight Food Waste CRC will deliver at least 25 PhD and 12 Masters graduates.

The Fight Food Waste CRC research projects are initiated and championed by industry participants, with their focus on achieving commercial outcomes. Where there is no commercial sensitivity, the Fight Food Waste CRC will ensure rapid dissemination of customised information through the Industry Connection Hub. This is a strong distributed education model of key national food and packaging industry associations who are participants in the Fight Food Waste CRC. They collectively represent businesses across the food value chain and will deliver information to their members and stakeholders, importantly they will also provide feedback and intelligence on emerging priorities for the research program.

In relation to building capacity, bespoke dissemination and skills development programs will be created through the Industry Connection Hub following an initial training needs analysis. It will focus on creating competitive advantage for Fight Food Waste CRC participants associated with commercial opportunities associated with research outcomes and associated behaviour changes.

As detailed in the NFWB, households and consumers play a significant role in the volumes of food wasted each year. Likewise, the Fight Food Waste CRC also has a significant focus on mapping food waste hotspots, developing behavioural insights around their causes, and providing a portfolio of communication materials to encourage reductions. With a growing community expectation associated with environmentally responsible business practices, the Fight Food Waste CRC will also support businesses to enhance their ability to reduce food waste.

Ultimately if Australia is to achieve SDG 12.3 it will require a 20 – 30% reduction in consumer food waste. This has been achieved in the United Kingdom by WRAP through the Love Food Hate Waste and associated programs such as the Courtauld Commitment that lead to complementary campaigning by signatories to the voluntary commitment. While the NFWS Voluntary Commitment will target food waste occurring within industry along the supply chain, a similar behaviour change commitment will be required by households and consumers.

The ultimate aim must be a long-term national food waste behaviour change program supported by the Australian Government, state, territory and local governments, industry and the Fight Food Waste CRC.



Grant Agreement Key Activities

Output		Milestone	Relevant Project(s)
Output 1 – Educating future industry professionals	Year 1 - 3	Commencement of 30 PhD students (3.1)	Various Projects
	Years 7-10	Completion of 25 PhD students (3.2)	Various Projects

Output		Milestone	Relevant Project(s)
Output 2 – Industry dissemination and skills training	Year 1 - 3	Industry dissemination and skills Training Needs Analysis (TNA) (3.3)	3.2.1 Industry Connection Hub
	Years 4-6	Industry dissemination and skills Update of TNA (3.4)	3.2.1 Industry Connection Hub

Output		Milestone	Relevant Project(s)
Output 3 – Household and business behaviour change	Year 1 - 3	Behaviour change for household members: Undertake survey of food buyers and present findings in report that will be available to project participants (3.5)	3.3.1 Understanding consumer food waste attitudes and behaviours and interventions to reduce food waste 3.3.2 Food waste reduction roadmap for Woolworths
	Years 4-6	Behaviour change for household members: Develop Interventions (3.6)	3.3.1 Understanding consumer food waste attitudes and behaviours an interventions to reduce food waste 3.3.2 Food waste reduction roadmap for Woolworths



Key Outcomes and Impact

The outcomes expected of the ENGAGE program are:

- future industry professionals, including at least 30 PhD and 12 Masters enrolments in this rapidly growing field
- upskill industry through an extensive extension network involving many peak industry associations and institutes
- new industry training packages and tools with at least 250 industry people trained each year that can access Fight Food Waste CRC research results to minimise food waste in their businesses
- unite existing household and business food waste behaviour change activities in Australia while learning from the best such as WRAP (UK), who have saved UK consumers at least £13 billion.

Indicative Budget and Staff Alloca-

	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
Cash (\$'000)	887	1,567	1,377	1,301	1,299	1,299	1,285	1,280	1,280	1,028
Non-staff In-kind (\$'000)	236	237	236	217	213	213	213	213	213	213
Staff In-kind (FTE)	4	4	4	3	3	3	3	3	3	3

Benefit/Cost Analysis

The Fight Food Waste CRC expects to deliver **\$118 million** in benefits to Australian society from the ENGAGE program. The program will cost **\$13 million** to deliver and will require additional expenditure for usage of outputs of **\$5 million**.

Expected benefit to cost ratio: 6.5:1



Future Initiatives

Below is a list of potential **ENGAGE** initiatives that go beyond the existing Grant Agreement milestones listed above:

Primary Production

- Engage with farmers and fishers to explore on-site value-adding options for out of specification products.

Manufacturing

- Examine the potential benefits of a food waste reduction certification scheme linked to the NFWS Voluntary Commitment.

Retail and Hospitality

- Examine the potential benefits of a food waste reduction certification scheme linked to the NFWS Voluntary Commitment.

Household

- Determine the most cost-effective methods to deliver consumer education related to the pre-shop planning, purchasing, storing, meal planning, cooking of food and using leftovers to create new meals to avoid food waste, including improving consumer understanding date-labels and product storage and use advice.
- Undertake research into bin behaviour that may reduce food waste going to landfill.
- Identify the drivers that would make wasting food unacceptable in the Australian context.

Whole of supply chain

- Develop the business case for a 10-year national food waste consumer and industry behavioural change program.
- As part of the NFWS contribute to coordination of delivery of a national consumer behaviour change program to prevent household food waste entering landfill.
- Establish an annual food waste forum or summit.

Policy

- Leverage international research and policy partnerships with countries and organisations like EU's REFRESH, UK's WRAP, and other leading countries and programs in Europe and the USA. e.g. SAVE FOOD and Stop Wasting Food.

Training

- Continue to build Industry Connection Hub activities to enhance the national reach of the Fight Food Waste CRC R&D results and extend research outcomes into industry training activities.
- Develop a National Food Loss and Waste Knowledge Hub website to host information about Australia's approach to food waste policy, research, information and initiatives.
- Collate and develop educational resources on food loss and waste for adoption by schools, universities and industry education programs and industry peak bodies.
- Development of formal qualifications (such as Graduate Certificate in Food Waste Reduction and Management or similar) to enhance the professionalism of the field.

Investment Strategy

The Fight Food Waste CRC will apply its Australian Government CRC Program grant funding against industry contributions to deliver the Grant Agreement, which was executed with the Australian Government CRC Program on August 8, 2018. The Grant Agreement involves 57 performance milestones that have been outlined in the previous pages. It is currently estimated that delivering the Grant Agreement will require around 95% of current funding. Untied funding will be applied against future initiatives that will deliver the greatest return on investment in regards to food waste reduction and industry profitability. This will involve the development of an Investment Framework.

	Deliver the Grant Agreement	Current funding Future Initiatives - Meeting SDG 12.3	Total CRC
REDUCE	\$10,800,379		\$10,800,379
TRANSFORM	\$23,396,379		\$23,396,379
ENGAGE	\$8,952,079		\$8,952,079
Operational Costs	\$14,263,736		\$14,263,736
Untied Funds*	\$2,184,500	\$3,512,806	\$5,697,306
Total	\$59,597,073	\$3,512,806	\$63,109,879

*Estimate subject to change over time based on a range of variables such as actual contribution and expense levels and whether grant funds need to be utilised in order to meet expected research organisation returns. - amount allocated to 'Delivering the Grant Agreement' relates to leverage promised to original sponsors who have withdrawn (net of those who have joined). With the balance allocated to 'Future Initiatives'.

We aim to grow the Fight Food Waste CRC's participant cash contributions from existing and new members by 5% per annum to firstly replace funding lost due to participant withdrawals during Year 1, and secondly to deliver REDUCE, TRANSFORM and ENGAGE future initiatives outlined in the previous pages. As depicted earlier (page 31), this will accelerate food waste reduction in Australia and maximise our chance of achieving SDG 12.3. It will also ensure that the Fight Food Waste CRC's operating expenses average 20% or less as a percentage of income over our 10 year life, compared to the long-term average for CRC's of 30% central expenditure spend.

Deliver the Grant Agreement

Match existing industry participant contributions to projects.
Development of projects that fully utilise the existing participant commitments (+ CRC matching where applicable) and deliver on the Grant Agreement and original business case.

Deliver Future Initiatives

Use untied funds to attract new industry participant funding.
Investment framework to be developed following Strategic Plan, Impact Model and Gap Analysis.
Aim to grow the Fight Food Waste CRC's industry cash contributions by 5% per annum to deliver future initiative.

Monitoring Impact

The Fight Food Waste CRC specifically addresses the top three growth opportunities for Australian food and agribusiness identified in the FIAL Size of the Prize report:

1. Food waste (28-35% CAGR),
2. Supply chain transformation (16-21% CAGR)
3. Reducing packaging waste (7-32% CAGR).

To monitor its impact on food waste reduction and industry profitability the Fight Food Waste CRC has established an Industry Impact Committee. The objectives of the Industry Impact Committee are to:

1. maximise the economic, environmental & social returns from food waste for industry participants and to develop the circular food economy
2. facilitate the achievement of UN Sustainable Development Goal 12.3
3. undertake regular reviews of stakeholder engagement.

Key impacts of the Fight Food Waste CRC will include:

- a transformation in the way Australian industry and consumers view food waste as well as contribute to food rescue
- a suite of new tools and technologies for extracting the maximum value out of primary production, food manufacturing, supply chains and product sales, whether through waste transformation, supply chain innovation or brand protection
- reduction in food waste entering landfill and associated greenhouse gas emissions
- future industry professionals skilled in capturing opportunities identified by industry.

Based on the predictions of the Australian Government CRC Program Impact Tool, which was prepared for the Stage 2 funding application and reviewed extensively by KPMG Australia, the Australian Government can expect a return on their investment of at least 4.75:1, with individual program Benefit: Cost Analyses ranging from 4.6:1 for TRANSFORM with its higher establishment and usage costs, to 6.5:1 for ENGAGE.

Our risk-adjusted estimates are significantly more conservative than those reported by the Champions 12.3 in The Business Case for Reducing Food Loss and Waste¹³ which are:

- 14:1 for 700 companies in 17 countries that implemented food waste reduction initiatives
- 92:1 for food waste reduction activities initiated in London
- 250:1 for food waste reduction activities initiated in the United Kingdom.

In total the Fight Food Waste CRC expects to deliver risk adjusted, discounted (NPV) net economic benefit of \$2.0B between 2018 and 2033 based on the Impact Tool. Again, this is deemed to be conservative, as achieving the NFWS target of 50% food waste reduction by 2030 would deliver \$10B in economic benefits per annum. By comparison, WRAP in the UK has delivered at least £13B (A\$23B) in economic benefit since its inception in 2005, indicating that a much greater impact than that predicted is possible in Australia.

Net benefit impact models for each key impact area will be established in the Fight Food Waste CRC's project management software, to track how each project is contributing to the Fight Food Waste CRC's key impact areas of:

1. food waste reduced
2. industry profitability gained
3. kilograms of rescued food distributed
4. circular economy jobs created
5. greenhouse gas savings
6. future industry professionals graduated
7. industry individuals trained and implementing one new piece of food waste knowledge, technology, method or process at their place of employment.

The creation of the net benefit impact models will occur once the initial research project portfolio has been established. Baseline data and predicted impacts have been collected for each Fight Food Waste CRC project as they have gone through the project approval process.

¹³ Champions 12.3 (2017) The Business Case for Reducing Food Loss and Waste.

How We Operate



The following section details how the Fight Food Waste CRC will operate. The below sections, combined with the Grant Agreement performance milestones for any given year, will form the basis of an Annual Operational Plan that will be developed and approved by the Fight Food Waste CRC Board in Q4 (April – June) of each year.

Cooperation and Collaboration

Goal: We will be fiscally responsible and transparent, gaining meaningful insight through clear reporting and forecasting.

Key Tasks	Details	Frequency
Establish new projects from original grant agreement	New innovative collaborative research projects that address industry defined problems. 100 + projects are expected over 10-year CRC life	Ongoing
Project reporting	Progress reports prepared by project leaders, reviewed by participant representative, Program Leader and CEO Project Leader will be required to complete a final report detailing outcomes	Quarterly Upon completion of projects
Project meetings	Project Leaders will coordinate regular, informal project meetings, involving researchers and project party representatives	Regular, ad hoc
Project workshop and review	Project Leaders will coordinate at least one project workshop each year in April or May involving researchers and project party representatives	Annually
Updates to project milestones and utilisation plan	Project Leaders will consider, at least annually, whether any updates are required with respect to the project milestones and the utilisation plan	Annually
Publications and communication	Each project will generate a range of internal and external publications such as reports, scientific publications and conference abstracts	Regular, ad hoc
Industry Connection Hub	A platform for researchers and research students to access industry for activities such as surveys, interviews, market research and connections	Ongoing
Allocate postgraduate scholarships	Provide 30 PhD and 12 MSc scholarships with industry co-supervision to students working within Fight Food Waste CRC projects	Regularly until allocation exhausted
Student progress reviews	Monitor academic progress of students and their professional development within Fight Food Waste CRC	Quarterly

Innovation

Goal: We will be a One-Stop-Shop for industry and government due to our track record in delivering innovative food waste solutions.

Key Tasks	Details	Frequency
Communication program	e-Newsletter, journalist engagement, media articles event sponsorship, website, Twitter, LinkedIn	Ongoing
National Food Waste Strategy (NFWS) Steering Committee	Contribute to the NFWS through being an integral member of the Steering Committee	Quarterly
Industry Connection Hub	Conduct training using best practice and Fight Food Waste CRC research results for 250 industry personnel each year outcomes, utilisation plans and financial acquittal	Upon completion of projects
Generation of new projects outside of original grant agreement	Industry projects identified from the NFWB study and other strategic initiatives to help meet SDG 12.3	Regular, ad hoc

Finance

Goal: We will be fiscally responsible and transparent, gaining meaningful insight through clear reporting and forecasting.

Key Tasks	Details	Frequency
Budget	Annual financial budget 6-month reforecast	Annually
Management Accounts	Quarterly financial reporting to ARMC and the Fight Food Waste CRC Board	Quarterly
Statutory Financials	Preparation of general-purpose financial statements	Annually
Audit	Independent audit of financial statements	Annually
Recruitment of new participants	Recruit new participants or increase contributions from existing participants to replace contributions from those who have withdrawn Recruit new participants to fund new initiatives	Regular until funding is replaced Regular based on strategy

Participant Satisfaction

Goal: Central to our success will be satisfied participants which are intricately engaged in our RD&E projects and feel part of the Fight Food Waste CRC family.

Key Tasks	Details	Frequency
Participant survey	Participant satisfaction survey; resulting actions implemented	Annually
Participant engagement	Consistent and frequent contact with each participant via email, phone and 1:1s	Quarterly
Annual conference	1-2 day overview of Fight Food Waste CRC progress and project presentations/workshops	Annually
Participants meeting	Participants meeting held in conjunction with annual conference	Regular, ad hoc



Organisational Excellence

Goal: Through strong leadership, governance and accountability we will deliver what we have promised to our participants and the Australian Government CRC Program.

Key Tasks	Details	Frequency
Risk Management	Reporting regularly on risks and mitigation strategies to the ARMC/Fight Food Waste CRC Board. Consider the overall appropriateness of this risk management policy	Quarterly Annually
Impact Assessments	Project parties will be asked to complete an annual impact report for a period of up to 5 years following the completion of a project. Projected impact on reducing food waste and increasing industry returns included in each project proposal	Project start Annually Project completion
CRC Program reporting	Reports to the CRC Program detailing cashflow, contributions and any changes/issues	Quarterly
Annual Report	Report to participants and CRC Program detailing activities, progress and outcomes	Annually
Operational Plan	Reporting against progress of the Annual Operational Plan Setting new annual operational plan with reference to the strategy	Quarterly Annually
Strategic Plan	Review strategic plan and update if necessary	Annually
Annual General Meeting	Conduct AGM for the CRC Company (including directors' elections, provision of financial statements, appointment of auditor)	Annually
Directors Elections	Conduct directors' elections (following a nominations process)	Annually
Board Meetings	Face to face and via teleconference	At least quarterly (usually 6 p.a.)
Committee Meetings	Face to face and via teleconference meetings of the RCC, ARMC, RNC & IIC	Quarterly and as required
Compliance Register	Maintain and regulate compliance against key legal agreements/contracts	Quarterly
Communication Strategy	Review communication strategy and update if necessary	Annually

Our Structure

Board Committees



Corporate Governance

KEY DOCUMENTS

Fight Food Waste Limited (FFWL; ABN 90 627 226 537) is an independent organisation that manages the Fight Food Waste CRC and is a company Limited by Guarantee with members being the Fight Food Waste CRC core participants that opted to become members. The company is a registered charity with the Australian Charities and Not-for-profits Commission. The key legal agreements establishing both Fight Food Waste Ltd and Fight Food Waste CRC are:

- Fight Food Waste Ltd Constitution
- CRC Grant Agreement between the Australian Government CRC Program and Fight Food Waste Ltd
- Core Participants Agreement between all Core (cash contributing) participants and Fight Food Waste Ltd
- Individual Supporting Participants Agreements between in-kind only contributing participants and Fight Food Waste Ltd.

BOARD AND COMMITTEES

The governance and management structure of the Fight Food Waste CRC has been designed to deliver commercially driven outputs that will solve industry identified challenges. At the same time, the structure will promote high levels of quality collaboration between the participants and achieve the highest standards of accountability.

This will ensure that the Fight Food Waste CRC can fully exploit the diversity of expertise and knowledge within the participant group and maximise the opportunity for the outputs to be industry-ready and fully utilised.

Fight Food Waste Ltd has a skills-based Board elected by the members of the company. The Board is comprised of seven Directors, independent of the R&D providers, and selected by the members of the company against an agreed skills matrix. This ensures that the Fight Food Waste CRC Board operates to the benefit of all members and the objectives of the CRC. All nominated Australian Directors are likely to have completed the Australian Institute of Company Directors 'Company Directors Course'.

The Board is aided by four Board committees, namely:

- Industry Impact Committee
- Audit, Risk Management and Compliance
- Remuneration and Nominations
- Research and Commercialisation

These committees are chaired by a Fight Food Waste CRC Board Director and established following ASX and AICD guidelines. They are constituted by the Fight Food Waste Ltd Board, including expertise from both the CRC participants and outside if required. Their role is to provide expert advice and recommendations to the Fight Food Waste Ltd Board. While most of these committees are standard to CRCs in general, the Industry Impact Committee is unique to the Fight Food Waste CRC. It will have a remit to constantly review the Fight Food Waste CRC's impact on industry as a whole and ensure continual focus on improving that impact.

CRCs require a range of general skills, as well as domain knowledge. The general skills include:

- strategy
- governance
- leadership
- industry knowledge
- financial management, audit and accounting
- research management
- project management
- legal
- marketing
- intellectual property
- commercialisation
- education.

Domain knowledge for the Fight Food Waste CRC should include:

- international food waste initiatives
- food production, processing or manufacturing
- supply chain
- value added products
- economics
- change management
- consumer behaviour
- retail
- packaging.

POLICIES

Company policies have been developed across the following policy groupings and are available for members to view and download from

<https://fightfoodwastecrc.com.au/members/>

- Financial (e.g. delegations, procurement)
- Risk (e.g. WHS, risk management)
- Human Resources (e.g. code of conduct, remuneration)
- Operations (e.g. publication, project management).

RISK MANAGEMENT

The Fight Food Waste CRC recognises that managing risk plays a critical role in ensuring delivery of objectives. The Fight Food Waste CRC will have a risk management policy and implement a risk analysis and mitigation strategy at both an organisational and project level. Processes will be based on the current standard for risk management (AS/NZS ISO 31000:2009). At each level, risk analyses identify and address scenarios and events that might prevent the company from delivering its objectives.

The Fight Food Waste CRC company's risk exposure will be reviewed on a quarterly basis by the CEO, the ARMC and subsequently by the Board. The Research program will deploy a proactive risk management process.

IP MANAGEMENT

IP arrangements (including Utilisation Plans) will be agreed at each project's inception and will stipulate IP ownership, access and rights to financial returns (if any). To maximise the chance of successful uptake, industry participants within projects will have the first right to submit Utilisation Plans over the IP developed.

Participants within the Fight Food Waste CRC can expect new tools and techniques for identifying, reducing (including innovative packaging) and transforming food and industry waste and gaining access to highly skill postgraduates and industry professionals in the area from which to build their future workforce.

Full details regarding IP management can be found within the Fight Food Waste CRC Project Guidelines available for members from:

<https://fightfoodwastecrc.com.au/members/>



Participant Engagement

The Fight Food Waste CRC believes through effective cooperation and collaboration the Fight Food Waste CRC will be greater than the sum of its participants. To enable this, a Participant Engagement Framework was created.

The core objectives of our Participant Engagement Framework are to:

- increase the transparency of our activities and processes, and increase participation in these areas
- facilitate our ability to understand participants' concerns and interests and incorporate them into our processes and activities
- improve the way we communicate and engage with our participants, including enhancing the clarity, accessibility, relevance and timeliness of our communication throughout our engagement processes

- build participants' trust and confidence in the Fight Food Waste CRC and its governance processes, decisions and activities.

Principles for Engagement

The Fight Food Waste CRC has adopted the following key principles to guide participant engagement activities. The principles set the standards to which we aspire in building consistent, open and respectful working relationships.

The key principles that will guide our engagements are:



Listening

Listen to and seek to understand our participants' views and concerns



Inclusive

Be inclusive, inviting participants' views where appropriate on the design of our engagement to promote accessibility



Informing

Inform our participants via open, clear, relevant and timely communication



Transparency

Be transparent, clearly outlining what participants can expect from us and how their feedback will be taken into account



Responsive

Consider and respond to concerns, providing prompt and clear feedback



Consistent

A proactive, coordinated and consistent approach to engagement across the business



Targeted

Engage early and ensure engagement is prioritised and tailored to specific issues and projects



Measurable

Measure the success of engagement and apply learnings in designing and developing future engagement

Communication Strategy

The Fight Food Waste CRC's communication vision is to be the trusted source of food waste information in Australia. We will achieve this through the effective and frequent communication of new knowledge to build a positive reputation for the Fight Food Waste CRC that results in participants and research partners being sought out as leaders in their respective fields.

A key philosophy behind the Fight Food Waste CRC Communication Strategy is that of repetition; an understanding and recognition of the busy and complex lives that people are living, and in order to 'cut through the clutter', the tools and tactics must be accurate, vibrant, credible, consistent and collaborative. They must also be repeatedly delivered across a range of platforms to ensure breadth and depth of reach.

Across the REDUCE, TRANSFORM and ENGAGE research and development programs, there exists a plethora of stories relating to food waste reduction. Novel and contemporary science communication approaches will be used to instil a culture of narrative across the Fight Food Waste CRC researchers, and to drive these stories across multiple channels.

As part of this approach, we will incorporate a full suite of communication activities from traditional media and trade publications, online newsletters, public research summaries, through to events and engagement online and on social media platforms.

This range of activities will be delivered in conjunction with research and industry partners to maximise the value to the Fight Food Waste CRC.

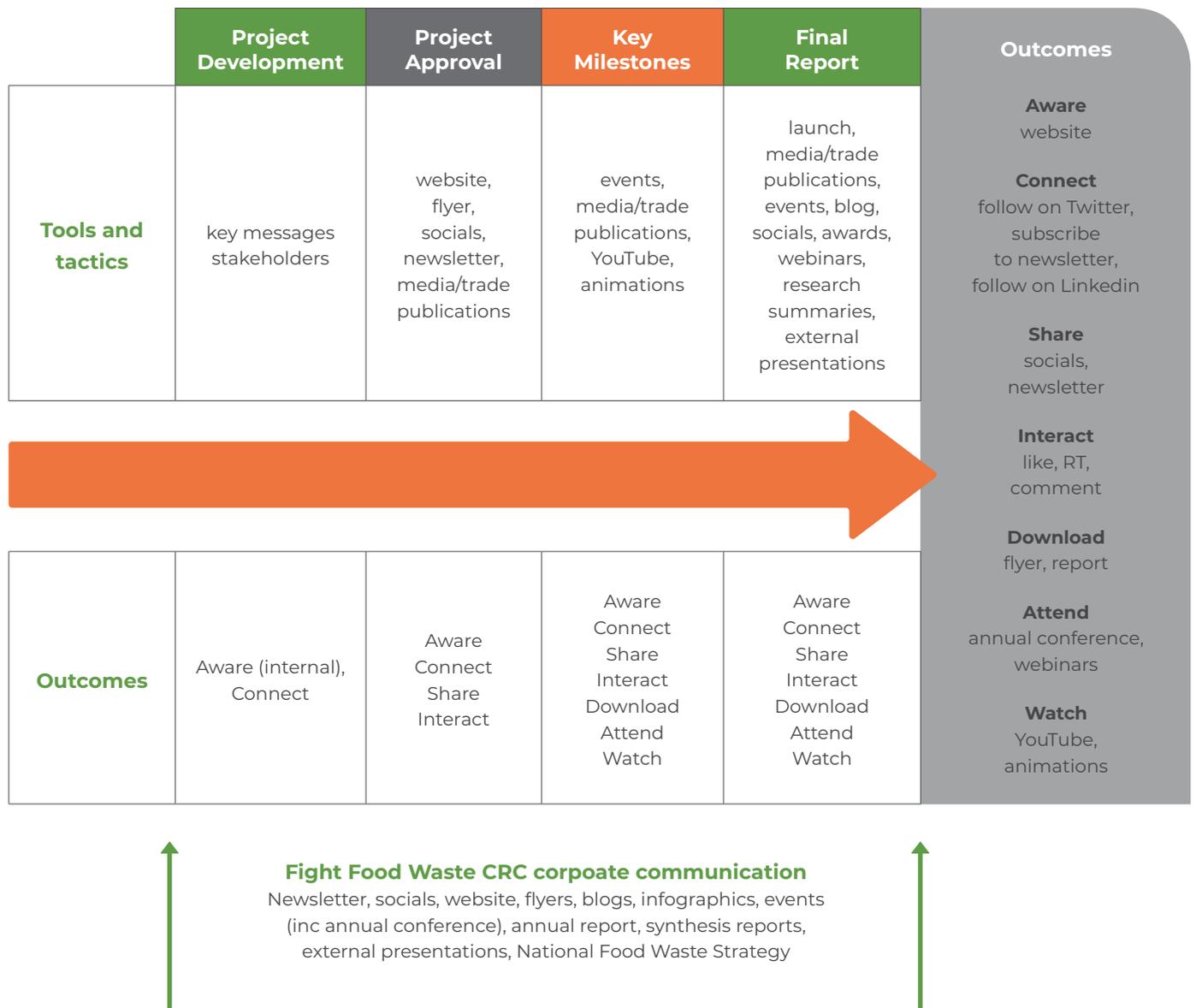
Whilst communication, marketing, public relations and digital engagement are distinct fields in their own right, this strategy has been developed in recognition of their complementarity and to provide a single direction for the Fight Food Waste CRC.

KEY MESSAGES

Across the range of stakeholders, these key messages are to be communicated directly or used as guiding principles:

- The Fight Food Waste CRC brings together industry, research and the community to capitalise on Australia's food waste opportunities.
- The research and development projects funded through the Fight Food Waste CRC have a real impact on food waste reduction and in generating a commercial outcome from the Fight Food Waste CRC activity.
- We are funded through our industry participants and the Australian Government Department of Industry, Innovation and Science's CRC Program that supports industry-led collaborations between industry, researchers and the community.
- The Fight Food Waste CRC supports the Australian Government in the delivery of the National Food Waste Strategy.
- Reducing food waste delivers triple-bottom line outcomes – social, environmental and economic.

Approach



SUCCESS MEASURES

The Fight Food Waste CRC Communication Strategy success measures (to be reviewed annually) are to:

- demonstrate ROI to participants
- engage industry and government with the Fight Food Waste CRC
- support the Industry Connection Hub
- create awareness of food waste across industry and the broader community
- become the trusted source for food waste information in Australia.

Detailed 10-year finance projections

	FY19 DRAFT	FY20 BUDGET	FY21 FORECAST	FY22 FORECAST	FY23 FORECAST	FY24 FORECAST	FY25 FORECAST	FY26 FORECAST	FY27 FORECAST	FY28 FORECAST	TOTAL	% OF INCOME
INCOME												
CRC Program	1,420,000	3,970,000	3,234,000	3,234,000	3,234,000	3,233,000	3,233,000	3,233,000	3,233,000	1,976,000	30,000,000	
Grant Funding: Other	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	1,000,000	
Participant Contributions	3,003,000	3,681,310	3,545,798	3,165,924	3,159,944	3,160,744	3,089,944	3,064,944	3,064,944	3,068,948	32,005,500	
Interest Income	4,379	15,000	15,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	104,379	
Unearned Revenue	(2,556,077)	(1,726,521)	979,562	696,749	724,344	475,016	208,796	60,296	(62,674)	1,200,509	0	
Total Income	1,971,302	6,039,789	7,874,360	7,206,673	7,228,288	6,978,760	6,641,740	6,468,240	6,345,270	6,355,457	63,109,879	
LESS DIRECT COSTS												
Office Lease Costs	82,000	83,640	85,313	87,019	88,759	90,535	92,345	94,192	96,076	97,998	897,877	1%
Program Coordination Support	677,092	715,088	717,468	720,052	725,384	727,892	730,450	733,059	735,720	738,434	7,220,639	11%
Project Costs	75,314	3,575,867	5,112,580	4,218,337	4,100,568	4,100,568	4,100,568	4,100,568	4,100,568	4,100,566	37,585,504	60%
Postgraduate Student Program	-	363,000	638,000	838,000	988,000	713,000	350,000	150,000			4,040,000	6%
Total Direct Costs	834,406	4,737,595	6,553,361	5,863,408	5,902,711	5,631,995	5,273,363	5,077,819	4,932,364	4,936,998	49,744,020	79%
GROSS SURPLUS												
	1,136,896	1,302,194	1,320,999	1,343,265	1,325,577	1,346,765	1,368,377	1,390,421	1,412,906	1,418,459	13,365,859	
LESS OPERATING EXPENSES												
Communication, Meetings & Conference	58,910	80,040	81,641	83,274	83,274	83,274	83,274	83,274	83,274	83,274	803,509	1%
Board Costs: Directors' Fees, Travel & Meetings	243,217	252,600	257,652	262,805	245,401	250,309	255,315	260,422	265,630	270,943	2,564,293	4%
Employment Costs: Head Office Personnel	586,566	783,038	798,505	814,282	813,998	830,278	846,884	863,821	881,098	881,339	8,099,808	13%
Professional Services, Insurance, Licences & Memberships	197,305	97,756	92,822	94,673	94,673	94,673	94,673	94,673	94,673	94,673	1,050,594	2%
Travel & Office Running Costs	50,898	88,760	90,379	88,231	88,231	88,231	88,231	88,231	88,231	88,231	847,654	1%
Total Operating Expenses	1,136,896	1,302,194	1,320,999	1,343,265	1,325,577	1,346,765	1,368,377	1,390,421	1,412,906	1,418,460	13,365,858	21%
Operating Expenses as % of income	58%	22%	17%	19%	18%	19%	21%	21%	22%	22%	21%	
Net Surplus/(Defecit)	0	0	0	(0)	(0)	0	(0)	0	0	(0)	0	0

Bid Funders

The following organisations are thanked for their financial contributions that made the Fight Food Waste CRC bid possible:



It should be noted that a number of contributors were related to the food and wine provenance/food fraud program that was not funded and they subsequently did not continue with the Fight Food Waste CRC.

Industry Advisory Committee

The Fight Food Waste CRC Board and Management team would like to acknowledge the Industry Advisory Committee that provided advice to the bid management team during the later stages of the bid, represented the bid at interview and assisted with the appointment of the inaugural Board:

- Adrian Cullen (Head of Sustainability, Woolworths)
- Al Jawhari (CTO Beston Global Food Group)
- Brianna Casey (CEO Foodbank Australia)
- Chris Deveney (Director FAVCO/Green Valley)
- Geoffrey Annison (D/CEO Australian Food & Grocery Council)
- Kimon Taliadoros (CEO Empauer)
- Robbie Davis (CEO Potatoes South Australia)
- Simon Woolmer (Manager Government Relations, Swisse Wellness)

Further Reading

Fight Food Waste Cooperative Research Centre

<https://fightfoodwastecrc.com.au>

United Nations Sustainable Development Goal 12

<https://sustainabledevelopment.un.org/sdg12>

National Food Waste Strategy

<https://www.environment.gov.au/protection/waste-resource-recovery/publications/national-food-waste-strategy>

Overview of Cooperative Research Centres – Department of Industry

<https://www.industry.gov.au/funding-and-incentives/business-and-startups/cooperative-research-centres>

Food Innovation Australia, Limited – Sector Competitiveness Plan

https://fial.com.au/Attachment?Action=Download&Attachment_id=37

Champions 12.3 (2019) SDG Target 12.3 on Food Loss and Waste: 2019 Progress Report

<https://champions123.org/wp-content/uploads/2019/09/champions-12-3-2019-progress-report.pdf>

World Resources Institute (2019) Reducing Food Loss and Waste: Setting a Global Action Agenda

<https://www.wri.org/publication/reducing-food-loss-and-waste-setting-global-action-agenda>

ReFED (2017) Economic Analysis: The Business and Societal Case for Reducing Food Waste

https://www.refed.com/downloads/Economic_Analysis.pdf

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https://www.churchilltrust.com.au/media/fellows/May_S_2017_To_research_international_models_for_reducing_food_waste.pdf

Food Innovation Australia, Limited (2017) Size of the prize, an overview of 16 global opportunities for Australian food and agribusinesses.

<https://fial.com.au/size-of-the-prize-report>



FIGHT FOOD WASTE
Cooperative Research Centre

REDUCE - TRANSFORM - ENGAGE



Australian Government
Department of Industry,
Innovation and Science

Business

Cooperative Research
Centres Program

Fight Food Waste CRC

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