Minister's Approval for Linkage Projects for Funding Commencing in Jul 2020 Round 1 Schedule

Approved Organisation, Leader of Approved Research Program	Approved Research Program	Estimated and Approved Expenditure ($)			Indicative Funding ($)		Total ($)	Partner Organisation(s)
		2020-21 (Column 4)	2021-22 (Column 5)	2022-23 (Column 6)	2023-24* (Column 7)	2024-25* (Column 8)	(Column 9)	(Column 10)
(Columns 1 and 2)	(Column 3)							

Australian Capital Territory

The Australian National University

LP200100100 Friel, Prof Sharon	This project aims to generate new knowledge on how government and non-government organisations can prevent poor health via their effective regulation of harmful commodity industries, specifically alcohol and highly-processed food. The significance of this project is its innovative approach to regulation, with a focus on engagement processes between state and non-state actors for the management of harmful commodities. Expected outcomes include improved methodologies in the field of health governance, and enhanced capacity among Partner organisations to engage effectively with different industries. These outcomes should benefit health policy prevention goals.	179,477.00	164,994.00	187,293.00	0.00	0.00	531,764.00	OBESITY POLICY COALITION, FOUNDATION FOR ALCOHOL RESEARCH AND EDUCATION LIMITED, NCD ALLIANCE

National Interest Test Statement

This project will create new knowledge in the commercial determinants of health, a rapidly growing field of public health relating to the policies, practices and products of industries, and their positive and negative impact on health. Successfully regulating the tobacco, alcohol and highly-processed foods industries and consumption of their products is vital to reduce associated disease burdens of diabetes, obesity, heart disease and cancers in Australia. We will do this by creating better understanding of how non-government organisations and government agencies can work more effectively to help industries create product environments making healthy behavioural choices easier for the Australian population. The outcome will be a powerful framework enabling policymakers, regulators, industry, and non-government organisations to co-create successful regulatory approaches. Australia will build cutting-edge expertise in a part of public health crucial for improving disease prevention, relieving pressure on the health system, and helping create economic prosperity.

LP200100406 Hogg, Prof Andrew M	Ocean and sea ice models are used for predicting future ocean and climate states, and for climate process research. This project aims to bring the next generation of ocean-sea ice models to Australia and configure the models for our local priorities. The ultimate goal is to create a new coupled ocean-sea ice model for Australia that includes surface waves and biogeochemistry. The model will be optimised and evaluated on Australian facilities, and released for community use. These developments underpin future ocean state forecasts, sea ice forecasts, wave forecasts, decadal climate prediction and climate process studies. The project will benefit search and rescue, Defence and shipping operations, and will enhance future climate projections.	291,229.00	289,255.00	285,914.00	295,114.00	0.00	1,161,512.00	AUSTRALIAN ANTARCTIC DIVISION, BUREAU OF METEOROLOGY, DEPARTMENT OF DEFENCE, COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION

National Interest Test Statement

Ocean-sea ice models have a wide range of applications, underpinning ocean state forecasts, ecosystem prediction, decadal climate forecasts and future climate projections. This project will drive the new development required to keep Australia at the forefront of the international ocean-sea ice modelling community. The modelling tools, configurations and outputs generated as part of this project will be released openly for the entire community, and will enable new capability, such as ocean wave forecasts and sea ice forecasts, that will enhance maritime safety, improve Australia's Antarctic operations and feed into predictions needed for maritime Defence operations and commercial shipping. At the same time, these developments will support the work of the next generation researchers into ocean circulation and sea ice distribution, and train the brightest new students.

LP200100413 Smyth, Prof Bruce M	This project aims to examine the role and effectiveness of smartphone apps in supporting families to respond to the many challenges of post-separation co-parenting. In an increasingly digital landscape where poor app choices can have serious consequences for families, this knowledge is urgently needed by parents and family law practitioners. This project expects to deliver a comprehensive understanding of the benefits and risks of digital divorce apps. Expected outcomes include the first web-based decision-making tool to help separated parents make important decisions about managing post-separation communication. This should provide significant benefits, including a reduced risk of parental conflict and better outcomes for children.	92,797.00	115,025.00	0.00	0.00	0.00	207,822.00	RELATIONSHIPS AUSTRALIA (VICTORIA) LIMITED, RELATIONSHIPS AUSTRALIA CANBERRA & REGION INCORPORATED

* Note - Indicative funding for approved projects will be made available through a funding variation under section 54 of the ARC Act

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National Interest Test Statement

Half of all divorces in Australia involve children, with additional children impacted through de facto separations. The particular risks faced by children in separated families make it all the more imperative that separated parents communicate in respectful, child focused ways. Children whose parents have separated face a higher risk of poorer long-term outcomes across a range of social/psychological factors, with around 1.5 times to twice the risk of low academic achievement, emotional/behavioural difficulties, substance use, crime and poor mental health in later life. The recent COVID-19 pandemic has further highlighted the importance of access to effective digital communication tools. Through a detailed examination of the role and effectiveness of post-separation co-parenting smartphone apps, this project aims to provide critical information to assist family law professionals, family support service providers, and separated parents. By improving communication pathways and reducing conflict, the research hopes to have immediate benefits for the wellbeing of families-especially children impacted by divorce.

The Australian National University		563,503.00	569,274.00	473,207.00	295,114.00	0.00	1,901,098.00	
Australian Capital Territory		563,503.00	569,274.00	473,207.00	295,114.00	0.00	1,901,098.00	

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New South Wales

Macquarie University

LP200100190 Dafforn, Dr Katherine A	Most current approaches to shoreline protection involve the use of ecologically damaging hard structures. Nature-based alternatives are increasingly adopted, but often without scientific evidence that they are environmentally-friendly. With rising sea-levels, the need for coastal protection will increase, so it is essential that we develop ecologically sustainable approaches to shoreline protection. The aim of this study is to assess changes to biodiversity and ecosystem functions associated with different protection strategies. The research outcomes will be an understanding of the broad ecological impacts from these approaches and will provide the basis for ecologically sustainable shoreline protection in coastal lakes and lagoons.	100,128.00	194,876.00	110,263.00	0.00	0.00	405,267.00	LAKE MACQUARIE CITY COUNCIL, DEPARTMENT OF PLANNING INDUSTRY AND ENVIRONMENT

National Interest Test Statement

Australia's coastal ecosystems are of enormous economic, social and ecological value, estimated at $895 billion per year. With 85% of the population living within 50 km of the coastline, these ecosystems are impacted by increasing coastal development. Coastal lakes and lagoons are among the world's most productive environments, but most are low-lying so are also at significant risk from flooding and erosion. Shoreline protection against erosion and flooding has typically relied on hard engineering approaches such as the construction of seawalls in the past, but nature-based solutions are increasingly used in attempts to prevent ecological damage. This project will evaluate current shoreline protection strategies used in coastal lakes and lagoons to help develop environmentally-friendly strategies. Findings from this project will have direct relevance to balancing the protection of land-based assets from coastal erosion with conserving the ecology of these important coastal systems.

LP200100380 Sharma, A/Prof Mridula	Indigenous Australian children experience middle ear disorders earlier in life and for longer periods than their non-Indigenous counterparts. The resulting listening challenges can have implications for academic achievement and future health and well-being, despite normal hearing thresholds. The current project aims to determine the effects of pervasive otitis media and related hearing loss on Indigenous children's listening and pre-literacy skills in the Northern Territory, and how to better identify those at most risk for poor educational outcomes. The findings will lead to policy recommendations to help improve these children's learning potential.	50,000.00	50,000.00	0.00	0.00	0.00	100,000.00	NT DEPARTMENT OF EDUCATION

National Interest Test Statement

This project will have significant education and health economic benefits for Australia's Indigenous children in the Northern Territory, who have one of the highest incidences of middle ear disorder in the world. Preliminary data has shown about 50% of youngest children had some degree of middle ear disorder across 4 communities. This project addresses the fundamental question of listening abilities in these children, and the impacts this may have on their pre-literacy skills. Given the importance of reading in Australian society today, this will help ensure that these children can reach their full potential at school and beyond, becoming productive members of society, and contributing to Australia's increasingly high-quality workforce. This project also aims to train the teachers within the community schools to support children with middle ear disorder as well as train Audiology students a community-based multidisciplinary clinical practice that will translate into better hearing health for participating communities and strengthen Australia's position as a world leader in hearing research and care.

	Macquarie University	150,128.00	244,876.00	110,263.00	0.00	0.00	505,267.00	

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The University of New South Wales

LP200100009 Brannigan, Dr Erin B	This project aims to interrogate the relationship between dance and visual art practices and institutions since the turn of the 21st century, developing solutions for emerging and associated challenges for artists and art workers. As a contemporary art form, dance innovates our museums and galleries by foregrounding challenging issues such as the dematerialization of art, the nature of creative labor, digital archives, experience as economy, and participatory aesthetics. Bringing academics, curators, conservators and artists from diverse institutions together, Precarious Movements stages a dialogue between dance artists and art institutions to support exemplary creative arts practices and the production of end user processes and protocols.	166,871.00	108,612.00	116,698.00	0.00	0.00	392,181.00	ART GALLERY OF NSW, TATE, COUNCIL OF TRUSTEES OF THE NATIONAL GALLERY OF VICTORIA

National Interest Test Statement

This project aims to position Australian artists, art workers, and researchers as leaders in the field of innovative creative, curatorial and conservational practices across dance and the visual arts. In doing so, it would give our artists, art institutions, and art workers international exposure and ensure they are recognised locally as important researchers and practitioners. Through its public outputs the project will help promote the arts through the promotion of engaging and accessible creative work, and this may in turn influence related arts policy. Its end-user outputs, such as institution-based practice and policies, will support the work of artists working in newly interdisciplinary ways and contexts and position Australia as a global leader in this emergent field of creative practice.

LP200100019 Hamilton, Prof Alexander R	This is a joint proposal to combine IMEC's technology and facilities for silicon chip fabrication with UNSW's expertise in quantum devices to optimise the design and fabrication techniques used to manufacture silicon based hole spin qubits on an industrial scale in a full 300mm wafer fabrication line. IMEC is a world-leading research and innovation hub in nanoelectronics and digital technologies, with a €1billion semiconductor chip fabrication facility, while UNSW has unparalleled cryogenic equipment and theoretical expertise for the study of electrons and holes in semiconductor devices. The outcomes will open up new routes to spin-based quantum computing based on holes.	140,232.00	140,232.00	140,232.00	0.00	0.00	420,696.00	IMEC

National Interest Test Statement

This project will link Australian researchers with IMEC, a leading semiconductor research consortium, as a step towards industrial development of silicon spin quantum computing. It will enable Australian scientists to work with and visit a leading industrial R&D fabrication facility, with tools, capabilities and linkages that do not exist in Australia. Similarly IMEC researchers will visit Australia and benefit from the tremendous expertise and unique research facilities developed in Australia. This proposal fits in the National Research Priorities of Cybersecurity and Advanced Manufacturing, and will not only build Australian research capacity but also provide a quantum trained workforce in an area that Google, Microsoft, IBM and Intel are investing in and actively recruiting staff in.

LP200100056 Dong, Prof Zhao Yang	The project aims to enhance large scale renewable penetrations to national power grid by advancing control, optimization, and ancillary services of Virtual Power Plants (VPPs), considering different disruptive events including recent South Australian blackout. This project expects to create new control, frame communication architecture, develop plug and play type IoT enabled grid interfacing inverter, and optimize resource management for distributed VPPs. The anticipated benefits from this institutional level collaborations are that VPPs help in enhancing national power grid operations during normal and disruptive conditions when more renewables are connected and also secure benefits of consumers, prosumers, and grid operators.	100,000.00	100,000.00	100,000.00	0.00	0.00	300,000.00	COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION, BAYVIEW SCIENCE & INNOVATION PARK PTY LTD, FUTURE X ENERGY PTY LTD, JINAN JIACHENG BUSINESS SERVICE CO., LTD, VANZONE TECHNOLOGY LTD, ITIC PTY LTD

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(Columns 1 and 2)	(Column 3)									

National Interest Test Statement

The project addresses issues related to "An Environmentally Sustainable Australia" and "Responding to Climate Change and Variability" by adapting more renewables to the grid through the development of Virtual Power Plant and helps in achieving country's carbon reduction target. It will develop new control techniques and communication architectures to allow maximum renewable penetrations without compromising with National grid stability. Preventing a blackout saves big revenue loss, e.g., recent SA blackout caused a financial loss of about $300 M AUD. According to Australia's National Science Statement, Government vision is to "produce new research, knowledge and technologies" – this project is align with this as it aims to develop new tools, framework and control techniques for the virtual power plant. That statement also encouraging and supporting collaboration across disciplines, sectors and internationally. To fulfil this criteria this project formed an excellent research team from 4 Universities, CSIRO, and 6 national and international partner organizations who are providing cash and in-kind supports.

Approved Organisation, Leader	Approved Research Program	2020-21	2021-22	2022-23	2023-24*	2024-25*	Total ($)	Partner Organisation(s)
LP200100063 Tello, Dr Verónica	Regional art museums need to diversify to maintain relevance to the communities they serve as these communities are increasingly Culturally and Linguistically Diverse (CALD) resulting from humanitarian resettlement programs. However, their strategies are limited to diversifying audiences rather than including CALD people in leadership positions in the museum. Working with the Murray Art Museum Albury, situated in Albury-Wodonga, this project creates a new museological method to generate structural change, training future CALD cultural leaders and prototyping an inclusive museum. It proposes that regional art museums, embedded in sites with shifting populations, are able to lead structural diversification in Australian art.	116,281.00	114,700.00	107,946.00	0.00	0.00	338,927.00	MURRAY ART MUSEUM ALBURY

National Interest Test Statement

This project will benefit regional art museums and CALD communities. Economically it will expand regional art museums' capacities to develop new audiences, enhancing their market opportunities across exhibitions and services. It will ensure that regional art museums stay relevant to their changing demographics, maintaining alignment with government (local and federal) recommendations to diversify. It will seize the market opportunity of researching and training emergent CALD talent, of benefit to the arts sector which is broadly lacking CALD representation. It will produce social benefits, so that regional CALD communities feel welcome within local art museums. Museums are crucial civic spaces for exploring public debates and histories, and it's vital CALD communities are meaningfully represented not just as audiences, but are able to voice their stories, make and exhibit art, and lead museums. Culturally this project will benefit regional art museums by giving a platform for CALD-led curating and public programming and engagement with Australia's disparate art histories, past and present.

Approved Organisation, Leader	Approved Research Program	2020-21	2021-22	2022-23	2023-24*	2024-25*	Total ($)	Partner Organisation(s)
LP200100106 Shen, A/Prof Yansong	Raceway dynamics in ironmaking blast furnaces affect operational stability and cost considerably, yet their dynamic behaviour has not been well monitored online. The project aims to develop a data-driven model for monitoring the internal state of gas-solid-powder reacting flow in the raceway and predicting raceway anomalies online. It will be achieved by combining particle-fluid numerical simulations with data processing and reduced-order state observer, supported by lab/plant experiments, and collaborating with two industry partners from coal and steel industries. The project outcomes including codes, models and raceway control strategies can help promote Australian metallurgical coal's global markets and ultimately the Australian economy.	95,302.00	219,576.00	224,845.00	0.00	0.00	539,723.00	ACARP, BAOSTEEL COMPANY

National Interest Test Statement

High pulverized coal injection (PCI) and optimal raceway control is the key to lowering production cost and stable furnace operation in blast furnace ironmaking. Australia and China are the world's largest PCI coal exporter and importer, respectively. This project will work with Australian coal companies and a world-leading steel company to jointly develop a data-driven method for monitoring raceway dynamics and predicting raceway anomalies through a comprehensive multiscale theoretical and experimental studies, and then to jointly evaluate a wide range of Australian PCI coals. The project will provide a flagship platform to foster collaboration throughout PCI coal supply chain between Australia and China. The project deliverables including models, codes, strategies, training of young engineers will promote research and marketing capability of Australian metallurgical coal producers and/or distributors and thus Australian PCI coal's global market including China and India, enable a more competitive and sustainable Australian mineral industry, and ultimately enhance the competitiveness of Australian economy.

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(Columns 1 and 2)	(Column 3)								
LP200100138 Sherwood, Prof Steven C	Wind gusts are rare bursts of high wind, often associated with thunderstorm outflows. They can do significant structural damage, and their rarity and small scale make prediction and risk assessment difficult. This proposal seeks to better understand and predict wind gusts and their impacts to aid in planning. The project aims to use past observations, modelling, and basic theory to show what conditions lead to wind gusts and how likely they are to exceed key thresholds. It targets important scientific and practical issues such as the joint occurrence of gusts and high rainfall, role of gusts in contributing to dust and other airborne pollutants, impacts of gusts on subsequent storm activity, and gusts in a warming climate. **National Interest Test Statement** Severe storms in Australia accounted for nearly 300 million AUD per year of damage as of 2008, mainly from hail and wind. Wind gusts also interact with storm and fire development and air pollution. Yet there are few studies of wind gusts in Australia. They are probably not well represented in weather models, and almost completely ignored in climate models. This project aims to address these issues, and thereby produce practical benefits such as: • Risk assessment for wind-related damages and wind/rain compound events, in present and future climates. • Input to infrastructure planning and regulation. • Improved understanding of how high winds and thunderstorms affect particulate pollutants, leading to improved risk assessments for human health. • Insights required to properly represent gust impacts in weather and climate forecast models, enabling more reliable weather and climate forecasts. • Improved understanding in the university sector of the needs of state governments and stakeholders related to extreme weather.	117,500.00	117,500.00	127,500.00	0.00	0.00	362,500.00	DEPARTMENT OF PLANNING INDUSTRY AND ENVIRONMENT, BUREAU OF METEOROLOGY
LP200100255 Zhao, Prof Chuan	Low-cost and robust fuel cell technology is a cornerstone towards the success of the hydrogen economy. The project aims to address the cost and durability of hydrogen fuel cells by advancing low-cost electrocatalysts for oxygen reduction reactions. Novel non-precious catalysts will be developed, and their stability understood in fuel cells using a new approach with in situ current mapping and X-ray computed tomography. The expected outcomes of this project include material development, improved characterisation techniques and new knowledge on electrocatalysis. The project will benefit Kohodo Hydrogen Energy by positioning them as an Australian leader in low-cost catalysts, and to Australian industries in developing the hydrogen economy. **National Interest Test Statement** Challenges facing Australia have propelled the demand for low-cost and robust clean technologies such as hydrogen fuel cell technologies. By smart catalyst design and architecture on the nanoscale and using start-of-the-art imaging techniques, hydrogen fuel cells using non-precious metal and carbon-based catalysts will be constructed in this project, and their performance investigated and understood. These catalysts will highly benefit Australian society by contributing to clean energy and sustainable environments. Furthermore, the knowledge base of science and technology in Australia will be increased by the results of this project. Finally, the development of hydrogen fuel cells will contribute to Australia's economic development and growth.	202,863.00	109,963.00	111,740.00	0.00	0.00	424,566.00	KOHODO HYDROGEN ENERGY PTY. LTD.
LP200100531 Foster, Prof Stephen J	This project will lead a paradigm shift in concrete mix design methodology, which is currently focused on meeting the mechanical performance objectives of concrete, to a holistic approach that maximises durability of concrete alongside its mechanical performance. The approach is based on a hybrid methodology involving mathematical optimisation of concrete mix based on empirically formulated objective functions for durability properties and mechanical properties. The multi-objective nature of proposed optimisation model will allow simultaneous consideration of several design objectives including: minimising the overall risk of cracking, minimising the permeability; and maximising the rate of strength development.	121,000.00	134,342.00	128,775.00	0.00	0.00	384,117.00	BORAL LIMITED

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(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)	(Column 9)	(Column 10)
	National Interest Test Statement							
	Australia invests over $200 billion each year in construction, with over $80 billion of this in infrastructure. If built with durable materials, developed infrastructure can serve the Australian economy and society for many years. However, when affected negatively by durability problems, the cost of maintenance, rehabilitation and early replacement of infrastructure and buildings can be significant – it is estimated that 27% of annual investment on infrastructure are related to maintenance and replacement. This project will lead a paradigm shift in concrete mix design practice, which is currently focused on mechanical performance objectives, to a holistic approach that maximises durability of concrete alongside its mechanical performance. The multi-objective nature of optimisation model will allow simultaneous consideration of multi-design objectives, including minimising the risk of cracking, minimising the permeability and maximising the rate of strength development. The project will see considerable benefit to the Australian economy through the delivery of more durable, long-lasting, infrastructure.							
LP200100601 Malaney, Prof Robert	This work proposes to investigate a new space-borne platform capable of quantum communications with a terrestrial ground station. Different from existing space-borne quantum communication platforms, our new platform will be based on CV (Continuous Variable) technology and will integrate the ability to seamlessly switch to classical Free-Space Optical communications when channel conditions deem quantum communications are too difficult. Currently no quantum satellite built on CV technology exists. Our research will produce a significant advance in an emerging technology space, and will allow Australia to take scientific leadership in an important aspect of ultra-secure communications from satellites.	120,681.00	123,922.00	127,203.00	0.00	0.00	371,806.00	NORTHROP GRUMMAN
	National Interest Test Statement							
	This research will contribute to Australia's national interest through its ability to enhance our space-based communication system through increased data rates and unconditional security. Our outcomes will help secure the networks that will form the core of Australia's future communications; being deployable in Commercial, Government, and Defence Networks. Although the technology space researched is effectively new, it is already clear that quantum communication, enabled via suitably equipped satellites, will become a significant new component of long-range secure communications. This project will allow Australia to take a lead role in an important component of this commercially-viable new field. Our scientific outcomes should also lead to enhanced communication between satellites that will be of interest to local high-technology companies hoping to build on the momentum created by the new Australian Space Agency.							
	The University of New South Wales	1,180,730.00	1,168,847.00	1,184,939.00	0.00	0.00	3,534,516.00	

The University of Newcastle

Approved Organisation, Leader of Approved Research Program	Approved Research Program	2020-21	2021-22	2022-23	2023-24*	2024-25*	Total ($)	Partner Organisation(s)
LP200100261 Hayward, A/Prof Matt W	This project aims to determine the impact of the catastrophic black summer fires of 2019/20 on threatened wallabies, including the parma wallaby (that had 70% of its entire distribution burnt) and the red-legged pademelon. Following these fires, wildlife across Australia has been decimated. This project expects to generate new knowledge by comparing burnt and unburnt areas before and after the fires to determine their impact on threatened wallaby conservation ecology. The expected outcomes of this project include improved understanding of the impact of fires on Australia's iconic wildlife. This should significantly improve our ability to reduce the risk on these species in future megafires.	108,937.00	63,206.00	62,284.00	0.00	0.00	234,427.00	DEPARTMENT OF PLANNING INDUSTRY AND ENVIRONMENT, DEPARTMENT OF PRIMARY INDUSTRIES - NSW, FORESTRY CORPORATION OF NEW SOUTH WALES, ALBERT LUDWIG UNIVERSITY OF FREIBURG
	National Interest Test Statement							
	Australia possesses some of the most unique biodiversity on the planet, however the catastrophic, 'black summer' fires of 2019/20 have placed many of these species at extreme risk of being driven completely extinct. The broader society has recognised this with vast sums of money donated to wildlife rehabilitation organisations, however it is also critical that we understand the impacts of the fires on our biodiversity via sustained research. The NSW government recognises that via their support for this critical project to understand the impacts of the fires on the threatened macropods, including the parma wallaby that has had over 70% of its entire distribution burnt since September 2019. This project will yield fundamental information on the impacts of the fires and identify methods of how to cope with such fires that are forecast to become more frequent in the future. These methods are likely to improve the conservation of a suite of Australia's iconic wildlife species.							

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LP200100367 Huang, Prof Jinsong	The settlement of road embankments built on soft soils can take many years which has created additional challenges for road design and construction. Despite many years of experience with the Pacific Highway Upgrade, industry partners have seen many examples where embankments have settled more than expected during construction and after road opening. This causes potential delay delivering projects, ponding, potential aquaplaning and unexpected maintenance. This project aims at developing useful tools for industry to better predict the settlement of embankment built on soft soils. The intended outcomes can help to increase the safety level of road transportation system of Australia, reduce construction and maintenance costs.	65,778.00	131,556.00	65,778.00	0.00	0.00	263,112.00	SMEC AUSTRALIA PTY. LIMITED, COFFEY GEOTECHNICS PTY LTD, TRANSPORT FOR NSW

National Interest Test Statement

Population growth in Australia has increased demand for new and upgraded transport infrastructure within intervening coastal areas underlain by soft soils. This project aims at providing industry a useful tool to better predict the settlement of embankment built on soft soils. Immediate benefits of this project include the reduction of construction and maintenance costs of road transport system. The broader impacts of this research will lie ultimately in a reduction of societal and economic costs achieved through better engineering guidelines and government regulations for embankment built on soft soils. The research will have broader impacts in geotechnical science and engineering through improved understanding of settlement behavior of soft soils, and development of more scientific methodologies for dealing with uncertainties and risks associated with soft soil engineering.

LP200100537 Neilan, Prof Brett A	Saxitoxins are potent microbial toxins, which pose a significant threat to food and water quality. Highly pure saxitoxins are required for environmental monitoring and studies of cell physiology. Certain analogues have also shown promise as long-lasting and non-addictive pain blockers. However, the procurement of these compounds from natural sources is convoluted and unsustainable. This project aims to use the latest synthetic biology techniques to characterise, modify and express saxitoxin biosynthesis pathways, thereby providing a sustainable source of toxin analogues of value to industry and research. This novel 'green technology' will benefit the environment, human health and the Australian economy.	138,193.00	141,933.00	138,933.00	0.00	0.00	419,059.00	DIAGNOSTIC TECHNOLOGY PTY LIMITED

National Interest Test Statement

The development of a 'green' technology platform for the production of saxitoxin analogues will benefit the environment, human health and the Australian economy. Saxitoxins, are valuable commodities, retailing for ~$1,000 AUD per gram. They are sourced by water quality and food safety utilities around the world as analytical standards for environmental monitoring, and also by toxicology and cell physiology researchers studying pain. Current methods for procuring these compounds are expensive, time-consuming and unreliable. Our proposal will enable the efficient and sustainable manufacture of saxitoxin analogues in Australia, thus capitalising on and expanding the current niche market. Presently, there is no compound that binds with exquisite selectivity to pain-signalling receptors. Similarly, we have unreliable sources of analytical standards for testing food and water. Should such a molecule be manufactured in sufficient quantity, its market value would be globally significant.

	The University of Newcastle	312,908.00	336,695.00	266,995.00	0.00	0.00	916,598.00	

The University of Sydney

LP200100053 Löschke, A/Prof Sandra K	The project aims to unlock the redevelopment potential of ageing apartment housing by developing a co-design process to enable transformative redesign to become a mainstream redevelopment option in partnership with leaders in the emerging practices of transformative redesign. The outcomes will be a conceptual framework and practical guide to realise sustainable housing futures beyond demolition. This will benefit the Australian environment, economy and society by changing thinking around sustainable delivery of housing, creating new industries and services in the construction sector, and facilitating the effective transformation of old buildings into attractive spaces that add value for residents, neighbourhoods and cities.	81,821.00	125,791.00	112,572.00	0.00	0.00	320,184.00	COX ARCHITECTURE PTY LIMITED, GOVERNMENT ARCHITECT'S OFFICE, ALLEN JACK & COTTIER ARCHITECTS PTY LIMITED, LANNOCK STRATA FINANCE 2 PTY LTD, MAX BUILD PTY LIMITED

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		2020-21 (Column 4)	2021-22 (Column 5)	2022-23 (Column 6)	2023-24* (Column 7)	2024-25* (Column 8)	(Column 9)	(Column 10)
(Columns 1 and 2)	(Column 3)							

National Interest Test Statement

The Co-Design Guide will assist in adapting and upgrading ageing apartment buildings to better meet changing economic, social and environmental needs. It will provide a feasible and scalable alternative to demolish and rebuild that is more economically, socially and environmentally sustainable. It will reduce risks associated in collective decision-making and give owners a voice in what happens to their property. It will provide the information necessary to make transformative re-design a mainstream alternative, providing new opportunities for Australia's design and construction industries. For residents and the broader public, the result will be healthier and more sustainable living conditions, increased amenity and improved property values. Access to the guidelines will create new skills and facilitate new client services for architects and construction professionals. The research will provide new evidence to inform public policy on design excellence, urban renewal and housing quality.

LP200100188 Chester, A/Prof Lynne M	This Project aims to develop solutions for low-income renters to access solar energy. Low-income households spend higher proportions of income on electricity costs. Solar energy is a key way to reduce electricity costs and thus improve energy affordability. Renters are largely excluded from this opportunity. Intended Project outcomes are solutions to access solar energy suitable for widespread application to low-income private, public and community rental housing. Adoption of the Project's outcomes are expected to benefit low-income renters, assist electricity retailers to maintain and extend their customer base, and provide commercial incentives for the many stakeholders providing rental housing and residential solar and battery systems.	135,000.00	72,156.00	50,000.00	0.00	0.00	257,156.00	AGL ENERGY LIMITED, SOUTH AUSTRALIAN COUNCIL OF SOCIAL SERVICE INC

National Interest Test Statement

The Project's intended outcomes—solutions for low-income renters to access solar energy—will yield a range of benefits for the Australian community without the need for government policies or expenditure. Solar energy is a key means to reduce household electricity costs and more effectively improve energy affordability. Australia's social fabric will benefit from improved energy affordability potentially being available to over 1.3 million low-income renter households. Greater use of solar energy for electricity generation, by low-income renters, will contribute to addressing the growth in carbon emissions which will be of environmental benefit. The potential extension of solar energy use to over a million households, with the possibility to further extend to higher-income renters and low-income owner-occupiers, will present a sizeable commercial opportunity for electricity retailers, and residential solar-battery system suppliers and installers. These social, environmental and commercial benefits will also contribute to Australia's economic growth.

LP200100311 Sidhu, Prof Baljit S	This project aims to investigate how firms should disclose the impact of climate-related risk on financial statements, the contribution of their own activities to climate risk and a best practice set of quantifiable metrics that can be assured by auditors. The aims will be achieved through surveys of chief financial officers and auditors and generation of input-output models at the firm level. The outcomes will benefit accountants and auditors who calibrate these impacts, and regulators such as the Australian Accounting Standards Board and Auditing and Assurance Standards Board, in developing accounting disclosure and auditing standards. It is vital to investors, insurers and governments for efficient resource allocation and planning.	97,400.00	99,540.00	103,029.00	0.00	0.00	299,969.00	AUSTRALIAN ACCOUNTING STANDARDS BOARD, AUDITING & ASSURANCE STANDARDS BOARD

National Interest Test Statement

The financial risks of climate change are of increasing concern to firms, investors and financial markets. This project aims to investigate how businesses should best disclose and recognise the impact of climate-related risks on financial statements, and their own contribution to those risks. Best practice disclosure methods are of high relevance to this proposal's partner organisations, the Australian Accounting Standards Board (AASB) and the Auditing and Assurance Standards Board (AUASB), in developing accounting and auditing standards. Beyond accountants and auditors, the outcomes will be of significant benefit to investors, insurers, central bankers, policy makers and governments concerned about the systemic risk of climate-related risks and efficient resource allocation and planning. Developing best practice guidelines will benefit the Australian economy and beyond on an international scale given the development of disclosure regulations is in its infancy, and current practice is inconsistent and sporadic.

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(Columns 1 and 2)	(Column 3)							
LP200100336 Wrigley, Prof Cara	This project aims to generate novel product design guidelines for developing safer controllers for use by potentially stressed individuals in high-risk situations. It will do this by generating specific insights and verifying generalisable solutions from the context of total artificial heart recipients –who must engage with critical controllers constantly. This project expects to generate new knowledge in design by establishing a new research topic around an under-examined user cohort. Expected outcomes of this project include interaction design theory developments and improved controller design techniques. This should provide significant benefits and competitive advantages by lowering stress and improving safety across a range of contexts.	98,241.00	80,966.00	95,726.00	0.00	0.00	274,933.00	BIVACOR PTY LTD

National Interest Test Statement

By generating new guidelines for companies who produce safety-critical controllers, this project will benefit businesses, vulnerable users, the general public, Australian researchers, and the domestic healthcare system. Users who are compelled to engage with controls or monitoring equipment in high-risk situations can be stressed and therefore subject to errors. These errors can compromise both their own safety and the safety of others across a range of contexts such as emergency services, health, and transport. This project will improve user performance and emotional wellbeing related to operating critical controllers – with a view to reducing the risk of mistakes and accidents. Competitive market advantages for Australian industry are expected: from higher efficiency and reduced downtime; and from a highly marketable narrative about health, safety, and happiness. Secondary benefits follow, from a reduced burden on the public healthcare system. Nascent links between project partners will be formalised by this project and demonstrate clear routes to further collaborations, with additional research training.

LP200100431 Ford, Prof Michele T	This project aims to produce the first systematic assessment of gender-based violence (GBV) in Cambodia's construction sector, which employs an unusually high percentage of women. Using quantitative and qualitative methods, the project will investigate the causes and manifestations of workplace GBV and produce an analysis of local and international labour movement actors' efforts to combat it, with a focus on how Cambodia's cultural, political and economic context influences local actors' uptake of international norms. In addition to academic benefits, this analysis will benefit our partner organisations, which plan to use the project's findings to strengthen their programs and better equip local unions to tackle workplace GBV.	110,582.00	50,000.00	79,195.00	0.00	0.00	239,777.00	UNION AID ABROAD-APHEDA, BUILDING AND WOOD WORKERS INTERNATIONAL, SOLIDARITY CENTER

National Interest Test Statement

The Australian government has a direct interest in addressing GBV in Cambodia. The Department of Foreign Affairs and Trade (DFAT) invested $13.4 million in initiatives to end violence against women in that country in 2012–17, and continues to invest through its Equitable Sustainable Services initiative. Several Australian NGOs are targeting workplace GBV in Cambodia, a significant proportion of which are funded by DFAT. Australian companies that work in Cambodia, like ARUP, will also benefit substantially from understanding the key drivers of GBV in the sector and strategies to combat it, which in turn will enhance occupational health and safety. From 2020 our Australian partner organisation, Union Aid Abroad – APHEDA, will roll out a new project on gender and labour in Cambodia, which includes a focus on GBV. Our project will support this and other Australian initiatives by providing a strong and robust evidence base for interventions and advocacy, in the process helping to generate stronger insights about what workplace GBV is, why it happens, and what most effective responses to it are.

The University of Sydney		523,044.00	428,453.00	440,522.00	0.00	0.00	1,392,019.00	

University of Wollongong

LP200100205 Klocker, A/Prof Natascha	Regional humanitarian settlement is a key priority across all levels of government in Australia. This study aims to provide the first longitudinal assessment of the impacts of regional settlement for humanitarian migrants and destination communities. Its innovative, mixed-method and multi-sited approach will generate new knowledge of the opportunities and challenges for sustainable regional settlement. Expected outcomes include enhanced community, organisational and government decision-making capacity. By guiding end-users' current and future actions, the study has strong potential to support the wellbeing of humanitarian migrants and to contribute to healthy and resilient regional communities.	203,705.00	247,776.00	264,701.00	168,281.00	230,606.00	1,115,069.00	DEPARTMENT OF HOME AFFAIRS, AMES AUSTRALIA, AUSTRALIAN RED CROSS SOCIETY, MULTICULTURAL NSW, MULTICULTURAL AUSTRALIA LTD

* Note - Indicative funding for approved projects will be made available through a funding variation under section 54 of the ARC Act

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(Columns 1 and 2)	(Column 3)							(Column 10)

National Interest Test Statement

In late 2019, the Australian Government committed to increasing refugee and humanitarian settlement in regional areas, including via direct (primary) settlement and voluntary (secondary) settlement. It explicitly recognised a need for improved evidence to support effective regional settlement planning and outcomes, both for humanitarian migrants and destination communities. This project responds to this identified need. It will conduct a rigorous and timely investigation of regional settlement trends and experiences and evaluate the effectiveness of different regional settlement approaches. Its mixed-method and longitudinal design will generate novel insights into the long-term implications of regional settlement for humanitarian migrants and destination communities. The study will provide a robust evidence base from which to plan for settlement policies and programs that support humanitarian migrants' wellbeing while also meeting the population and economic needs of regional Australia.

| | University of Wollongong | 203,705.00 | 247,776.00 | 264,701.00 | 168,281.00 | 230,606.00 | 1,115,069.00 | |

Western Sydney University

| LP200100103 Cameron, Dr Fiona R | The Project aims to investigate how museum collections, many of which have histories entangled in Australia's high emission sectors that supported the nation's economic growth, can be curated to support climate change mitigation. Drawing together the disciplines of biogeochemistry, museology, environmental humanities, Indigenous knowledge and education, the Project anticipates enhancing the Museum of Applied Arts and Sciences' capacity for climate action through innovative programs. Its benefits include developing new collections-based climate research which incorporate the perspectives of multi-stakeholders, including Indigenous Australians, and builds museums' capacity to grow public climate literacy. | 133,719.00 | 185,926.00 | 200,937.00 | 0.00 | 0.00 | 520,582.00 | MUSEUM OF APPLIED ARTS AND SCIENCES |

National Interest Test Statement

The Project will bring substantial social and cultural benefits to the Australian community by seeking to scale up Australia's mitigation ambition by developing novel types of mitigation instruments and strategies for climate action. Using an interdisciplinary approach, it achieves this by excavating the yet-to-be-told climate story of the Museum of Applied Arts and Science's (MAAS) science, technology and social history collections. The Project investigates how these objects, displayed as exemplars of Australia's modern achievement, are also entangled in the history of climate change and are themselves indices of rising CO_2 atmospheric concentrations. Articulating the climate story of MAAS's collections, the Project will extend MAAS's pedagogical initiatives on climate change to broad publics. This is all the more significant as the Museum finds itself in a moment of institutional transition and revision as it relocates to western Sydney, and for the museum sector, which receives 3.6 million visitors per year, concerned with formulating novel responses for climate action.

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(Columns 1 and 2)	(Column 3)							
LP200100331 Turbill, Dr Christopher	Australia's unique wildlife is inherently at risk from invasive novel pathogens. White-nose syndrome is an emerging fungal disease that has decimated bat populations across North America. This fungal disease is likely to soon jump continents and also seriously threaten Australia's bat fauna. This project aims to quantify the risk of exposure to this fungus and understand the sensitivity of Australian bat populations to white-nose syndrome mortality. Expected outcomes include spatially-explicit, species-specific models of vulnerability to white-nose syndrome for bat populations across south-eastern Australia, essential for directing actions to prevent, detect and mitigate the impacts of this potentially catastrophic wildlife disease.	204,193.00	179,429.00	159,402.00	0.00	0.00	543,024.00	UNIVERSITY OF WINNIPEG, TARONGA CONSERVATION SOCIETY AUSTRALIA, DEPARTMENT OF ENVIRONMENT LAND WATER AND PLANNING, ZOOS VICTORIA, COMMONWEALTH DEPARTMENT OF AGRICULTURE, WATER AND THE ENVIRONMENT, WILDLIFE HEALTH AUSTRALIA INCORPORATED, AUSTRALASIAN BAT SOCIETY INC, AUSTRALIAN SPELEOLOGICAL FEDERATION INCORPORATED, DEPARTMENT OF PLANNING INDUSTRY AND ENVIRONMENT

National Interest Test Statement

This project addresses the serious risk posed by a new fungal disease to an important component of Australia's unique fauna. The bat disease called white-nose syndrome was ranked in the top five of 'Priority native animal diseases and their pathogens' in the 'Interim list of priority exotic environmental pests, weeds and diseases' released by the Chief Environmental Biosecurity Officer. The information provided by this research will enable the most effective and efficient responses to the anticipated invasion into Australia by this fungal pathogen. Reductions in populations of insectivorous bats because of white-nose syndrome could negatively impact the quantifiable insect control services they provide to the agricultural industry, as well their important ecological functions to natural ecosystems. Moreover, the potential for very large negative impacts on bat populations would be of widespread concern to the Australian Public, who place intrinsic value in the health of our native wildlife.

LP200100428 Grace, A/Prof Rebekah L	A positive sense of cultural identity is critical to wellbeing, yet children in out-of-home care often lose their cultural identities and connections. There is little evidence to guide out-of-home care agencies to support a culturally meaningful foster care placement for non-Indigenous culturally and linguistically diverse children. This project tests promising practices identified by the partner organisations and research literature to produce an exemplary model of cultural care, with input from children, carers and birth families. Trial implementation in the partner organisations will inform guidelines and recommendations so that the model can inform policy and practice in out-of-home care across Australia.	84,866.00	89,138.00	80,819.00	123,284.00	0.00	378,107.00	SETTLEMENT SERVICES INTERNATIONAL LIMITED, KEY ASSETS THE CHILDREN'S SERVICES PROVIDER (AUSTRALIA) LIMITED, BARNARDOS AUSTRALIA, MACKILLOP FAMILY SERVICES LIMITED, ANGLICARE NSW SOUTH NSW WEST AND ACT, CHALLENGE COMMUNITY SERVICES, WESLEY MISSION, CHILDREN AUSTRALIA INC

* Note - Indicative funding for approved projects will be made available through a funding variation under section 54 of the ARC Act

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(Columns 1 and 2)	(Column 3)						(Column 9)	(Column 10)

National Interest Test Statement

Investing in the wellbeing of children in care is of critical national importance. These children are amongst the most marginalised and are at risk of poor life outcomes. Cultural disconnection further compounds this vulnerability. Cultural connection is crucial to supporting positive outcomes, and is a human right. There is a dearth of research to guide culturally supportive practice in OOHC. This study aligns with the National Science and Research Priority of Health: Practical Research Challenge 1 which speaks to the importance of developing better service models that improve outcomes and reduce disparities for disadvantaged and vulnerable groups. Australian OOHC services are currently in an era of significant reform. It is essential that high quality research is available to inform the national conversation. This study will be the first in Australia to include the voices of all stakeholders as this relates to culturally safe care environments, including young children and birth family members. It will also be the first to address the barriers for culturally diverse families to becoming foster carers.

Approved Organisation, Leader	Column 3	2020-21	2021-22	2022-23	2023-24*	2024-25*	Total	Partner
Western Sydney University		422,778.00	454,493.00	441,158.00	123,284.00	0.00	1,441,713.00	
New South Wales		2,793,293.00	2,881,140.00	2,708,578.00	291,565.00	230,606.00	8,905,182.00	

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(Columns 1 and 2)	(Column 3)							

Northern Territory

Charles Darwin University

| LP200100222 Banks, Prof Sam C | The project's aim is to map population connectivity and critical habitat for coastal marine megafauna in remote northern Australian waters, providing a more informed scientific base for biodiversity monitoring and management. The project will employ cutting edge methods in genetics and movement ecology and unite Indigenous rangers with marine national park managers and scientists. Expected outcomes include enhanced capacity for monitoring and conservation planning and new partnerships that will improve research capacity in remote environments. Benefits include environmental management led by Indigenous Traditional Owners, sea rangers and marine park managers, and conservation benefits to coastal dolphin and sea turtle species. | 180,688.00 | 181,314.00 | 173,198.00 | 0.00 | 0.00 | 535,200.00 | TARONGA CONSERVATION SOCIETY AUSTRALIA, PARKS AUSTRALIA NORTH, ENVIRONMENT AUSTRALIA, LARRAKIA NATION ABORIGINAL CORPORATION, MARTHAKAL HOMELAND & RESOURCE CENTRE ABORIGINAL CORPORATION, NORTHERN TERRITORY GOVERNMENT, SEA DARWIN PTY LTD |

National Interest Test Statement

As a nation, we have responsibility for the conservation of biological resources in accordance with traditional cultural practices that are compatible with conservation or sustainable use. The project will have environmental benefits to Australia by improving the knowledge base and capability for management of marine ecosystems in northern Australia. This project will build fundamental knowledge of culturally important coastal dolphins and sea turtles in remote marine ecosystems and develop capacity for scientifically-informed monitoring and management of these species by Indigenous and government organisations. The project will also deliver significant social and cultural benefits through enhanced collaboration between scientists, Indigenous sea rangers and marine national park managers and it will build trust in, and knowledge of, western science in remote communities. This model of collaboration will enhance the national capacity for research and environmental management through the engagement of the highly skilled Indigenous ranger groups of northern Australia's coast.

	2020-21	2021-22	2022-23	2023-24	2024-25	Total
Charles Darwin University	180,688.00	181,314.00	173,198.00	0.00	0.00	535,200.00
Northern Territory	180,688.00	181,314.00	173,198.00	0.00	0.00	535,200.00

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(Columns 1 and 2)	(Column 3)							

Queensland

Griffith University

| LP200100016 Shiddiky, Dr Muhammad J. A. S | Pathogenic organisms cause yield losses of more than $150M pa to the Australian sugarcane industry and many millions more worldwide. Partnering with Sugar Research Australia, this project aims to develop a novel on-farm diagnostic device, comprising new nanotechnology and magnetism-induced microfluidics with naked eye observation and electrochemical detection. This device is expected to enable improved disease management strategies through the prediction of potential risks and rapid and effective actions to mitigate impending yield loss. In turn productivity and sustainability of Australia's sugar industry will be enhanced. The new platform device has great potential for improved disease management in other crops in Australia and globally. | 77,000.00 | 85,000.00 | 88,000.00 | 0.00 | 0.00 | 250,000.00 | SUGAR RESEARCH AUSTRALIA LIMITED |

National Interest Test Statement

Crop and plant diseases adversely affect the quality, nutrient content, and yield of agricultural products and impact the economic growth of the agricultural and food sector. These diseases also pose a significant risk to biosecurity, environment and biodiversity. This project aims to develop a novel, portable on-farm diagnostic device for the early, rapid and accurate detection of two major sugarcane diseases. Improving the speed and accuracy of the diagnostic methods can be highly beneficial for monitoring these diseases in the field at regular intervals, allowing treatment to be adjusted in a timely manner, and thus improving overall disease management strategies. The technology will bring enormous benefits to the Australian agricultural sector through rapid, accurate and early detection of plant diseases, thereby predicting potential risk and enabling appropriate strategies to mitigate the impending yield loss and maintains a steady productivity. This project will generate direct economic benefits through improved knowledge translation and commercialisation with our partner Sugar Research Australia.

	Griffith University	77,000.00	85,000.00	88,000.00	0.00	0.00	250,000.00	

Queensland University of Technology

| LP200100382 Cholette, Dr Michael E | Rail maintainers currently use time-based (scheduled) approaches to balance the costs and benefits of inspections and maintenance. Changing to condition-based maintenance has the potential to reduce costs and improve track condition. This project aims to enable this approach for rail by developing: 1) new track degradation prediction techniques combining Big Data and engineering knowledge; 2) new on-board sensing capabilities for frequent, low-cost track monitoring; 3) novel inspection and maintenance optimisation methods to efficiently allocate resources. The knowledge generated by this project is expected to decrease maintenance costs, safety risk, and track closures and therefore enhance the affordability and reliability of rail travel. | 130,000.00 | 120,000.00 | 52,000.00 | 0.00 | 0.00 | 302,000.00 | QUEENSLAND RAIL LTD, ASSET INSTITUTE LIMITED |

National Interest Test Statement

The Australian rail industry is a large part of the national economic infrastructure, contributing more than $26 billion to the national economy and is responsible for more than one billion passenger journeys. However, operation and maintenance costs of this infrastructure are large and disruptions due to maintenance can lead to significant inconveniences for passengers. The impact of this project will be most tangible in reducing these maintenance costs (and service disruptions) without compromising safety, which could translate into increased ridership (and decreased transportation carbon footprint) by enabling reduced fares, expanded coverage, and/or more reliable timetables. The project will also strengthen the connection of the rail industry with both Australian and international experts on maintenance, laying the foundation for future collaboration by training new staff and students to work on projects relevant to Australian rail.

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(Columns 1 and 2)	(Column 3)							
LP200100468 Mengersen, Prof Kerrie L	This project aims to develop new statistical methods for extracting insights into spatial and temporal variation in areal data. These tools will extend the Australian Cancer Atlas which provides small area estimates for 20 cancers across Australia. The project is significant because it will allow government and other organisations to reap dividends from investment in collecting spatial information and it will enable modelled small-area estimates to be released without compromising confidentiality. The expected outcomes include new statistical knowledge and new insights into cancer. The results will benefit the many disciplines, managers and policy makers that make decisions based on geographic data mapped over space and time.	167,245.00	237,964.00	183,746.00	0.00	0.00	588,955.00	CANCER COUNCIL QUEENSLAND

National Interest Test Statement

The project will contribute to the Australian Government priority area of Health, and the practical challenge of "better models of health care and services that improve outcomes [and] reduce disparities for disadvantaged and vulnerable groups". The new methodology developed in the project will be more widely applicable to other priority areas that employ areal data and need to make decisions based on insights into spatial variation. These areas include Food, Transport, Resources and Environmental Change. The project will contribute directly to understanding patterns of variation in cancer across Australia, which can facilitate more locally targeted health management strategies, reduce health costs and save lives by reducing inequities in cancer survival. The project will also contribute to expanding knowledge and capacity in mathematical sciences, which is one of the key STEM fields. It will intentionally focus on encouraging women in STEM.

LP200100493 Karim, A/Prof Azharul	In this project, a novel multilevel modelling framework for food drying will be developed by integrating the micro, macro, and dryer scale transport process and considering the dynamic changes in the drying environment under the intermittent application of microwave energy (IMCD). This modelling framework will be the first comprehensive scientific tool for industry for developing next-generation food drying systems, which are expected to deliver significant improvement in energy efficiency and product quality and reduction in drying time and food waste. Finally, based on the outcomes of the modelling framework, a smart IMCD drying system will be developed to demonstrate the feasibility of the framework in industry application.	120,000.00	140,000.00	50,000.00	0.00	0.00	310,000.00	ICCON SOLUTIONS PTY LTD

National Interest Test Statement

Food processing is the largest manufacturing industry and has a huge economic potential in Australia. However, lack of proper post-harvest processing results in the wastage of agricultural products worth $20 billion/year. The Australian Federal Government has committed to reduce 50% of this waste by 2030. Drying is the dominant food preservation method and one of the major processes in food industry. Conventional food drying is a very energy intensive and lengthy process and results in significant food quality deterioration. The proposed multiscale modelling framework will contribute towards the resolution of these food industry problems by developing a next generation efficient drying system with intelligent control. Moreover, food drying is a largely untapped area; new innovative products can be introduced by drying fruits and vegetables. A cost- and energy-efficient dryer has the potential to trigger the establishment of many drying/food processing industries in Australia. This modelling framework can also be extended to other important industrial processes including pharmaceutical and timber industries.

Queensland University of Technology		417,245.00	497,964.00	285,746.00	0.00	0.00	1,200,955.00	

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(Columns 1 and 2)	(Column 3)							

The University of Queensland

LP200100060 Rhodes, Prof Jonathan R	Climate change, and the increasing risk of drought, heatwaves, and fire, have major implications for the design and effectiveness of private land conservation programs. This project aims to generate new knowledge about the effect of climate change on adoption and outcomes of private land conservation agreements. It will use an innovative social-ecological approach focused on koalas. Expected outcomes include an innovative framework to help make decisions about private land conservation investments under climate change. This should provide significant benefits for government and non-government organisations by providing solutions to climate-proof their conservation investments on private land in a rapidly changing world.	110,223.00	127,816.00	134,459.00	0.00	0.00	372,498.00	DEPARTMENT OF PLANNING INDUSTRY AND ENVIRONMENT, BIODIVERSITY CONSERVATION OF NEW SOUTH WALES, TWEED SHIRE COUNCIL

National Interest Test Statement

Much of Australia's unique biodiversity occurs on private land. Consequently, Australia invests heavily in mechanisms to achieve conservation outcomes on private land and this is reflected in Australia's Strategies for Nature and Threatened Species. Yet, climate change, and the associated increasing risk of drought, heatwaves, and fire, is having dramatic impacts on species occurring on private land, as well as landholders' ability and willingness to conserve species on their properties. In the face of these rapid changes, Australian governments and non-government organisations urgently require new knowledge and tools to ensure their investments in private land conservation continue to be effective. This project will directly improve decision-making by identifying which private land conservation strategies are robust to climate change risk, while taking full consideration of the social, economic, and environmental trade-offs. By focussing on koala populations, the project also addresses a major national priority to ensure the long-term persistence of this culturally iconic species.

LP200100064 Craik, Prof David J	This project between the University of Queensland and Syngenta, a top-tier agricultural biotech company, aims at developing new crop protection technologies based on peptides. Insecticides are essential to meet the 60% increase in food production goal set by the UN but long-term exposure to traditional insecticides can harm beneficial pollinating insect populations. Expected outcomes include an exciting new insecticide technology based on natural plant defense peptides, the cyclotides, which has potential to revolutionise crop protection, leading to safer products for the environment. Benefits from the technology include a reduction in toxic insecticide residues, precision targeted applications and agrichemicals that degrade without trace.	134,000.00	139,000.00	144,000.00	0.00	0.00	417,000.00	SYNGENTA CROP PROTECTION

National Interest Test Statement

Australia is a major agricultural producer and exporter, with over 300,000 jobs directly in agriculture and 1.3 million additional jobs if accounting for the complete agriculture supply chain. The agriculture sector represents 3% of the GDP and a gross value of $60 billion, more than 2/3 of which is from export. This project will result in a new eco-friendly insecticide technology, which will support the growth and sustainability of the Australian agricultural industry and, at the same time, will be safer for the environment, farmers and the Australian population at large. Our technology is based on peptides that have an excellent safety profile for human use and degrade in the environment into their constitutive amino acids, which are the simple building blocks of life. The environment is an important source of revenue for Australia, with the tourism industry worth 3% of the GDP and is also important for the well-being and way of life of the Australian population.

LP200100175 Jak, Prof Evgueni	This project aims to develop new, powerful state-of-the-art computer-based tools to predict the outcomes of complex chemical reactions, high-temperature ironmaking and slag recycling processes. Globally, over 1 billion tonnes of iron are produced each year consuming 30 billion billion (Quintillion) Joules energy! and creating over 300 million tonnes of molten oxides (slags). Our industry partners need new advanced thermodynamic databases and computer models with which to optimise their major industrial processes and develop new technologies. By delivering these tools, this project expects to benefit both industry and the community through improved process efficiencies, and reductions in energy usage, pollutants, and environmental impacts.	131,442.00	151,855.00	151,855.00	133,442.00	115,029.00	683,623.00	UMICORE NV, BHP INNOVATION PTY LTD, SWEDISH RESEARCH INSTITUTE FOR METALS

* Note - Indicative funding for approved projects will be made available through a funding variation under section 54 of the ARC Act

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		2020-21	2021-22	2022-23	2023-24*	2024-25*		
(Columns 1 and 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)	(Column 7)	(Column 8)	(Column 9)	(Column 10)

National Interest Test Statement

Approximately 15% of Australia's total export income, valued at AUD$63 billion annually, is derived from the export of iron ores, the essential raw material used in the manufacture of iron and steel. At the same time, the industry globally is addressing the climate challenge by reducing energy usage, greenhouse gas emissions and environmental impact, and also seeking ways to increase resource utilisation through the development of circular economy models. Through this project, Australia can contribute the specialist knowledge, skills and expertise in high temperature metals processing needed to support these efforts. The present project aims to provide important scientific and technical information and advanced predictive tools to industry to assist in the development of new, more efficient metal production and processing technologies. In these critical times, Australian industry and researchers have an opportunity to participate in and benefit from these international efforts.

Approved Organisation, Leader	Approved Research Program	2020-21	2021-22	2022-23	2023-24*	2024-25*	Total	Partner Organisation(s)
LP200100403 Zhu, Prof John	The project aims to develop novel drawn polymer fibres with aligned carbon nanotubes incorporated inside and also grafted nanotubes on their surface. Such polymer fibres can be used to reinforce thermoplastics to make high performance composites with effective recyclability. This is important as the existing thermosetting composites are not recyclable and significant property enhancement require high loading (>30%) of reinforcing fibres. The outcomes of this project will be novel technology for making high stiffness polymer fibres and their use in thermoplastic composites. The benefits will be to allow easy processing and recycling. They will be used in down-sizing of high volume products and high value automotive or aerospace products.	123,029.00	125,490.00	127,999.00	0.00	0.00	376,518.00	EDEN INNOVATIONS LTD

National Interest Test Statement

Polymer based composite materials are light stiff materials used in specialty applications such as aerospace. Those based on thermosetting resins require expensive and time-consuming manufacturing techniques and are not recyclable. Thermoplastic composites have much poorer properties but are cheaper to manufacture. This project plans to develop thermoplastic composites which bridge the performance gap with thermoset materials but retain the lower cost manufacturing and recycling ability of thermoplastics. The developed materials will lower the cost of manufacturing and open high volume, high value markets to polymer composites. The industry partner is commercialising Australian developed technology for making low cost carbon nanotubes. This project aims to generate high volume applications for their products which will both benefit Australian manufacturers and mitigate the environmental problem with existing composites that are disposed of in land fill. The proposed project clearly aligns with the 'Advanced Manufacturing' category of the Australian Government's Strategic Science and Research Priorities.

Approved Organisation, Leader	Approved Research Program	2020-21	2021-22	2022-23	2023-24*	2024-25*	Total	Partner Organisation(s)
LP200100418 Blaskovich, Dr Mark A	This project aims to understand how the compound cannabidiol is able to kill bacteria by examining its interactions with bacteria from a genetic and molecular level. This research is critical, because future development of cannabidiol and design of improved analogs is predicated on knowing how it works. Expected outcomes include the first detailed understanding of how cannabidiol interacts with bacteria. This should lead to significant benefits, including high impact publications, additional collaborations with industrial partner Botanix, and a new class of antibiotics to overcome antibiotic resistance.	259,529.00	221,876.00	159,473.00	0.00	0.00	640,878.00	BOTANIX PHARMACEUTICALS LTD

National Interest Test Statement

Antimicrobial resistance presents a substantial global economic and health threat with substantial impacts on Australia, as recognised by the National Antimicrobial Resistance Strategy released by the Australian Government in 2015. Key objectives of the strategy include research into new approaches to detect and contain antimicrobial resistance (Objective 5), and to strengthen international collaboration (Objective 6). This proposal clearly addresses both aims, as it is designed to provide increased fundamental knowledge of a potentially novel antibiotic class that appears to induce minimal antimicrobial resistance. There are clear economic and commercial benefits to the collaboration with industrial partner Botanix, who are actively developing the antibiotic in Australia in conjunction with a range of international collaborators to improve both food safety and human health. The fundamental knowledge being generated will allow for the design of new compounds, generating new intellectual property in Australia, with the potential for advanced manufacturing.

		2020-21	2021-22	2022-23	2023-24*	2024-25*	Total	
The University of Queensland		758,223.00	766,037.00	717,786.00	133,442.00	115,029.00	2,490,517.00	
Queensland		1,252,468.00	1,349,001.00	1,091,532.00	133,442.00	115,029.00	3,941,472.00	

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Approved Organisation, Leader of Approved Research Program	Approved Research Program	Estimated and Approved Expenditure ($)			Indicative Funding ($)		Total ($)	Partner Organisation(s)
		2020-21 (Column 4)	2021-22 (Column 5)	2022-23 (Column 6)	2023-24* (Column 7)	2024-25* (Column 8)	(Column 9)	(Column 10)
(Columns 1 and 2)	(Column 3)							

South Australia

Flinders University

| LP200100149 Saikia, A/Prof Udoy | This research aims to investigate the impacts of Australia's Seasonal Workers Programme and South Korea's Employment Permit System on the well-being of migrant workers and their families in Timor-Leste (East Timor). The contribution of this research to scholarship would be the creation of a sound method to measure the impact of temporary labour migration on well-being across various aspects of life that can be used by researchers in Timor-Leste and elsewhere to evaluate the development impacts of such migration schemes. The data will inform evidence-based policies to improve temporary labour migration schemes, meet urgent development priorities in Timor-Leste, and maximise the benefits of Australian aid funded labour migration schemes. | 72,540.00 | 71,578.00 | 68,094.00 | 0.00 | 0.00 | 212,212.00 | UNITED NATIONS DEVELOPMENT PROGRAMME, INTERNATIONAL ORGANIZATION FOR MIGRATION, DEPARTMENT OF FOREIGN AFFAIRS & TRADE, GOVERNMENT OF TIMOR-LESTE , GOVERNMENT OF TIMOR-LESTE DIRECTOR GENERAL OF STATISTICS |

National Interest Test Statement

This project reinforces Australia's close relationship with and commitment to its nearest neighbour, Timor-Leste. As migrant remittances are now several times larger than foreign aid across the globe, this timely and comprehensive study contributes to Australia's national interest in three ways: -The research-based evidence can help the Australian government enhance the effectiveness of its temporary migration programs in terms of poverty reduction and social development in Timor-Leste. -Creating an analytical tool to measure the well-being impacts of migration in migrant families in Timor-Leste, and building research capacity in Timor-Leste, will support an equitable and strategic development partnership between the two countries. -New information about the well-being of Timorese labour migrants in Australia and their reintegration in Timor-Leste will enable the Australian government and Australian employers to improve the quality equity and management of temporary migrant employment for mutual social and economic benefits.

Flinders University		72,540.00	71,578.00	68,094.00	0.00	0.00	212,212.00	

The University of Adelaide

| LP200100038 Karakus, A/Prof Murat | The project aims to develop an integrated method that uses micro scale and macro scale information to predict block scale behaviour so that a better cave mining design can be established. The role of various mineral composition on the energy storage and fracture properties of rocks will be investigated to examine rock fragmentation for block cave mining. Later Machine Learning based models will be developed to establish various predictive models for Block Scale rock mass behaviour and caveability of ore deposit. Finally, we will develop a new constitutive model based on a dual damage concept that will capture the rock fragmentation and simulate the cave propagation in a large scale mine layout using Smoothed-particle hydrodynamics. | 71,000.00 | 174,000.00 | 153,000.00 | 118,000.00 | 0.00 | 516,000.00 | OZ MINERALS LIMITED |

National Interest Test Statement

Our project will directly contribute to sustainable mineral extraction in underground mines, especially for mass mining methods such as block caving. This research will also underpin the development of the future supply of reliable, low-cost, low-emission energy, enhance the long-term viability of Australia's resources, services and manufacturing industries; and support Australia's access to new markets and supply chains. Block cave mining is known as ore factory due to its low operating cost. The proposed research project contributes to Technologies to optimise yield through effective and efficient resource extraction by introducing an effective block cave mining design. The project will also maximise Australia's competitive advantage in critical sectors technologies, such as sustainable underground mining operations.

Minister's Approval for Linkage Projects for Funding Commencing in Jul 2020 Round 1 Schedule

Approved Organisation, Leader of Approved Research Program	Approved Research Program	Estimated and Approved Expenditure ($)			Indicative Funding ($)		Total ($)	Partner Organisation(s)
		2020-21 (Column 4)	2021-22 (Column 5)	2022-23 (Column 6)	2023-24* (Column 7)	2024-25* (Column 8)	(Column 9)	(Column 10)
(Columns 1 and 2)	(Column 3)							
LP200100156 Cook, Prof Nigel J	The aims of this project address the critical mineral resource potential of complex copper ores. The research will generate new knowledge on the concentration, distribution, physical form and chemical speciation of critical minerals, including tellurium, cobalt and rare earth elements, in ores and processing streams using innovative approaches and utilising state-of-the-art analytical techniques. Expected outcomes include integrated models for critical element endowments in Australia's largest copper resource, Olympic Dam (S.A.). Future recovery of these elements would add significant value to existing operations, providing long-term economic and commercial benefits and would also contribute to Australia's transition to a low-carbon future.	200,000.00	134,000.00	122,000.00	0.00	0.00	456,000.00	BHP BILLITON OLYMPIC DAM CORPORATION PTY LTD

National Interest Test Statement

The project will contribute to future-proofing the Australian minerals industry, providing the knowledge necessary for exploitation of "critical" metals, including tellurium, cobalt and rare earth elements, which are contained within ores mined for copper yet are not recovered and refined at the present time. Demand for these commodities is increasing rapidly due to expanding applications in 'green' technologies. Exploitation of critical metals from existing mining operations in Australia will provide economic benefits, domestic supply to meet demand, new employment opportunities, and Australian leadership in this rapidly growing industry sector. New data on the distributions of minor elements in one of Australia's largest mineral deposit will assist in maximizing revenue and minimizing the residual value of critical metals currently reporting to waste, as well as providing guidelines for environmental management of those wastes. New products based on critical metals can represent exportable materials of value and may also contribute to Australia's transition to a green, low-carbon future.

LP200100541 Ebendorff-Heidepriem, Prof Heike	While mid-infrared (MIR) lasers have become indispensable to key industries ranging from research and healthcare to defence, industrial deployment of this technology has been hampered by the lack of cost-effective MIR optical fibres. This project aims to overcome this barrier through the creation of an innovative design toolkit for the fabrication of complex optical fibre structures. This efficient and commercially viable concept-to-manufacture development process will pave the way towards the MIR fibre technology revolution and will yield significant economic benefits spanning industrial process controls and environmental monitoring to hazardous chemical detection and biological sensing.	153,658.00	158,408.00	0.00	0.00	0.00	312,066.00	IRFLEX

National Interest Test Statement

This research will contribute to Australia's national interest by developing technology that will be key to enabling applications currently restricted by the lack of optical fibres to deliver mid-infrared (MIR) light. Cost-effective MIR fibres have potential for large benefits within environmental monitoring and sensing, as the direct absorption lines of a range of greenhouse gases lie within the transmission window of the chalcogenide fibres proposed here. Fibres will also find strong applications within the defence space, where MIR light is used for directed energy countermeasures. In addition to these application benefits, the improvements to development processes will be of great benefit to the manufacturing space, creating a digital twin for glass flow to accelerate future design and manufacturing.

	The University of Adelaide	424,658.00	466,408.00	275,000.00	118,000.00	0.00	1,284,066.00	

University of South Australia

LP200100489 Evans, A/Prof Drew R	The project aims to improve agricultural efficiency, productivity and yield by advancing the understanding of polymer materials interacting with fertiliser. This project will test the key assumptions behind a new sensor for real-time in-ground monitoring of fertiliser. The expected outcome from this is the rapid synthesis of conducting polymers for stable sensing of fertiliser in a range of soil types and conditions. This should provide the pathway to a world first real-time in-ground fertiliser sensor, providing benefit for the sensor manufacturers, farmers, consumers and the environment.	150,000.00	150,000.00	120,000.00	0.00	0.00	420,000.00	SENTEK PTY. LTD

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Approved Organisation, Leader of Approved Research Program (Columns 1 and 2)	Approved Research Program (Column 3)	Estimated and Approved Expenditure ($)			Indicative Funding ($)		Total ($)	Partner Organisation(s)
		2020-21 (Column 4)	2021-22 (Column 5)	2022-23 (Column 6)	2023-24* (Column 7)	2024-25* (Column 8)	(Column 9)	(Column 10)
	National Interest Test Statement							
	In this project, new scientific discoveries will be made towards realising a world first real-time in-ground fertiliser sensor for farmers. There is a significant opportunity for Australia to lead the revolution in agriculture through the adoption and integration of new technology - the high tech farm. This will bring new opportunities for economic and commercial gains right across the sector. The success of this project will enable improved outcomes for manufacturers, farmers, consumers and the environment. The new scientific discoveries also have spillover potential for biomedical and energy storage applications, as examples. Expanding the knowledge base through this project will keep Australian research and industry at the forefront of global efforts around the internet of things and the technology revolution in agriculture.							
LP200100617 Ma, Prof Jun	This project aims to develop new elastomer/graphene composites by designing and fabricating graphene precursors which can transform into graphene sheets during melt compounding with elastomers. These sheets have tunable surface affinity with elastomers, to attain expected dispersion in elastomers for effective reinforcement at low strain. The dominant filler in industry – carbon black – is ineffective at low strain. The outcomes are anticipated to transform the current manufacturing practice of rubber products for applications in agricultural, automobile, construction, medical and mining industries.	75,000.00	70,000.00	70,000.00	0.00	0.00	215,000.00	MARIC FLOW CONTROL AUSTRALIA
	National Interest Test Statement							
	The global elastomers market size is expected to reach USD 109.2 billion by 2025. Elastomers are ubiquitously used everywhere, spanning from the shoes to automobile tyres to civil engineering to ships. In fact, all major industries make use of elastomer and elastomer products. This project will develop a new technology for the manufacture of elastomer composites which address the challenges of most of elastomer products – the lack of sufficient stiffness and strength at low strain, by utilising graphene for elastomer processing. This will significantly improve the service life of elastomer products and reduce the maintenance costs. Through the development of novel approaches to produce new composite products, our research has potential to benefit a wide range of industry sectors including advanced manufacturing, agriculture, transport, energy and health.							
University of South Australia		225,000.00	220,000.00	190,000.00	0.00	0.00	635,000.00	
South Australia		722,198.00	757,986.00	533,094.00	118,000.00	0.00	2,131,278.00	

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Approved Organisation, Leader of Approved Research Program	Approved Research Program	Estimated and Approved Expenditure ($)					Total ($)	Partner Organisation(s)
					Indicative Funding ($)			
		2020-21 (Column 4)	2021-22 (Column 5)	2022-23 (Column 6)	2023-24* (Column 7)	2024-25* (Column 8)	(Column 9)	(Column 10)
(Columns 1 and 2)	(Column 3)							

Tasmania

University of Tasmania

LP200100404 Blanchard, A/Prof Julia L	This project aims to assess the global and local consequences of changing feeds in aquaculture by developing a new interdisciplinary sustainability assessment framework. The project expects to generate new methods to understand and predict local farm-to-ecosystem changes and global environmental footprints under contrasting feed and climate scenarios by integrating field data with novel experiments, modelling techniques and global mapping of terrestrial and marine feed raw materials and their impacts. Expected outcomes include new methods to assess ecological, social and economic trade-offs under different feeds to inform decision making in support of an ecosystem-based approach to aquaculture spanning global to local scales.	200,000.00	200,000.00	200,000.00	120,000.00	0.00	720,000.00	BIOMAR GLOBAL, UNIVERSITY OF CALIFORNIA, SANTA BARBARA, THE UNIVERSITY OF SHEFFIELD, UK, CERMAQ CANADA

National Interest Test Statement

Australia's aquaculture production is set to double by 2030 but there are major barriers to this growth, here and internationally, connected to polarised views about "what is sustainable". Our project partners are global companies developing and testing innovative feeds, to improve sustainability of aquaculture globally and for sustainable production and consumption in Australia. This project will bring together international expertise to develop new methods and assess ecological, social, cultural, and economic impacts of changes in marine and terrestrial raw materials used in feeds, across global and local scales. We will develop new integrative methods to provide the most comprehensive assessment of the cumulative impacts of different feeds from global to local scales; this will include four detailed case studies that collectively capture the spatially explicit supply chain of salmonid aquaculture. The project will provide a means for greater transparency and public understanding and ultimately will help the aquaculture industry provide more food and nutrition to people, with minimal ecosystem impacts.

University of Tasmania	200,000.00	200,000.00	200,000.00	120,000.00	0.00	720,000.00	
Tasmania	200,000.00	200,000.00	200,000.00	120,000.00	0.00	720,000.00	

* Note - Indicative funding for approved projects will be made available through a funding variation under section 54 of the ARC Act

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		2020-21 (Column 4)	2021-22 (Column 5)	2022-23 (Column 6)	2023-24* (Column 7)	2024-25* (Column 8)	(Column 9)	(Column 10)
(Columns 1 and 2)	(Column 3)							

Victoria

Deakin University

LP200100045 Gibson, Dr Jason M	This project will apply current scholarship on museum collecting practices, art and anthropology to produce a better understanding of one of Australia's most significant, yet little known, collections of Aboriginal art and culture —the Berndt Museum collection. The project will explore the legacy of this collection and generate new ways of appreciating its depth in partnership with the descendants of the Aboriginal people who made it. Focusing on materials collected in inland Australia, we will develop a collaborative means of interrogating the collection. The project will benefit Aboriginal communities and the wider Australian public via the production of on-line resources and public exhibitions celebrating this unique cultural collection.	123,730.00	182,824.00	180,668.00	0.00	0.00	487,222.00	SOUTH AUSTRALIAN MUSEUM, WARLUKURLANGU ARTISTS ABORIGINAL CORPO, WARLAYIRTI ARTISTS ABORIGINAL CORPORATION INC, ART GALLERY OF WESTERN AUSTRALIA

National Interest Test Statement

The Berndt collection is a nationally significant collection of Aboriginal art and material culture, with aspects recognised under the UNESCO Memory of the World Register. By undertaking research on this collection we will contribute to Australia's national interest by (1) recognising and celebrating of the rich diversity of Australian Indigenous cultural heritage, (2) achieving a better understanding of the complex historical and social dimensions of museum collecting in Australia, and (3) developing an appreciation of the complicated history of the relationships between the Berndts and the Aboriginal people they worked with. Our collaborative research into the rich collections of early desert art will also cause a rethinking of the history and development of Aboriginal art production, a sector which today provides important economic and health outcomes across remote Aboriginal communities.

LP200100265 Rolfe, Prof Bernard F	FormFlow has developed a ground-breaking forming process enabling the use of corrugated iron as a structural element. This is a step change for Australia`s steel and building industry and will provide a direct benefit to fireproofing homes. Up scaling of this new technology poses significant challenges due to the lack of understanding in the new forming process and the effect of pre-processing on the incoming material. Fundamental knowledge of material behaviour will be developed with advanced models that account for the unique process deformation conditions. The intended outcome includes computer software for process design and new concepts for part shape control to improve product quality, repeatability and enable high volume manufacture.	67,336.00	130,761.00	71,424.00	0.00	0.00	269,521.00	FORMFLOW PTY LTD

National Interest Test Statement

The FormFlow technology draws together Australia`s steel, building and metal manufacturing industries to take a technical leadership position in supplying innovative and leading-edge low-cost housing solutions. This project will facilitate industrial implementation and will provide the fundamental platform for the development of new forming concepts and FormFlow products. This will: 1) Stimulate economic activity and job creation while capitalising on existing manufacturing capability and expertise in the Geelong region; 2) Enable the development of innovative new building solutions, delivering a sustainable competitive advantage to Australian companies that can be leveraged internationally (commercial); 3) Facilitate more efficient methods of construction leading to more affordable low-cost housing (social); 4) Eliminate gaps in the external envelope of buildings to improve thermal efficiency, decrease environmental impact and reduce the threat of ember attack during bush fires (environmental); 5) Add a new dimension to the image of corrugated sheet as an Australian building material "icon" (cultural).

LP200100433 Barton, Prof Gregory J	This project investigates how the international development/humanitarian activities of Plan International should best address violent and hateful extremism (VHE). VHE impacts about 70% of Plan's $1bn global activity, and around USD80bn foreign aid globally. This project thoroughly examines VHE impacts on their work in Bangladesh, Myanmar, Philippines and Indonesia, to develop new situation assessment tools and indicators, in order to facilitate mainstreaming VHE into project planning and design and offer recommendations for primary (population), secondary (at-risk) and tertiary (those involved) interventions. Reduced VHE will benefit not only individuals participating in programs, but societies in those countries plus regional stability.	164,324.00	167,048.00	139,005.00	50,000.00	0.00	520,377.00	PLAN INTERNATIONAL AUSTRALIA

Approved Organisation, Leader of Approved Research Program	Approved Research Program	Estimated and Approved Expenditure ($)			Indicative Funding ($)		Total ($)	Partner Organisation(s)
		2020-21 (Column 4)	2021-22 (Column 5)	2022-23 (Column 6)	2023-24* (Column 7)	2024-25* (Column 8)	(Column 9)	(Column 10)
(Columns 1 and 2)	(Column 3)							

National Interest Test Statement

This project will help strengthen security and strategy with respect to Australia's $4bn per annum foreign aid program, by facilitating the mainstreaming of Violent and Hateful Extremism (VHE) analysis and consideration in aid project planning and design. It will develop new tools for assessing risk and make concrete recommendations to development/humanitarian agencies, about appropriate project interventions at primary (whole population), secondary (at-risk population) and tertiary (those already involved) levels. By doing so, it will help maximise the appropriateness and effectiveness of all aid programmes implemented by Plan International Australia in VHE-affected contexts, and through dissemination, will improve effectiveness across the whole aid sector. This is increasingly important for Australia's regional security, as DFAT instructs international development organisations such as Plan to integrate VHE considerations into aid programs. At the same time, these insights will also benefit community development programs within Australia through developing more effective responses to hateful extremism.

| | Deakin University | 355,390.00 | 480,633.00 | 391,097.00 | 50,000.00 | 0.00 | 1,277,120.00 | |

Monash University

| LP200100082 Turner, Dr Lincoln D | The project aims to develop breakthrough technology for generating the complex radio and microwave pulses that underpin the revolution in quantum computing and quantum sensing. Quantum technologies are rapidly emerging from laboratory to real-world applications including neural imaging, defence surveillance, and mining exploration, but further advances require increased precision and flexibility in controlling the quantum states at the heart of these new capabilities. Our innovative and more flexible approach to signal generation requires a fraction of the size, weight, power and cost of conventional approaches, enabling the translation of quantum technology to commercial practicality. | 136,779.00 | 179,284.00 | 135,202.00 | 0.00 | 0.00 | 451,265.00 | MOG LABORATORIES PTY LTD |

National Interest Test Statement

This Project aims to develop and commercialise innovative electronic technology to advance current and future quantum sensing and computation. Enhanced quantum sensors will benefit medical microimaging, mineral exploration and magnetic anomaly detection for defence. Existing quantum technologies are limited by the capabilities of the classical hardware that controls the quantum systems, particularly in relation to size, weight, power requirements and cost. This project aims to provide devices specifically designed for quantum technology - devices that are compact and power-efficient, to enable translation of laboratory quantum prototypes to real-world applications. New hardware and software products will underpin further growth in employment in Australia's emerging quantum industry, reinforcing its strong track record of export-dominated manufacture of high added value products.

| LP200100110 Yan, A/Prof Wenyi | This project aims to develop a damage tolerance approach in designing and maintaining truck trailers. Combined with field test and computational simulation, machine learning will be used to generate loading spectrums. Following the damage tolerance philosophy, a mature approach in aerospace industry, the fatigue crack growth and the fatigue life will be predicted. In addition, structural optimisation will be applied in trailer design. This project expects to revolutionize the design and maintenance practices in Australian truck trailer industry. It should provide significant benefits, such as prolonging the life cycle of truck trailers, reducing the tare weight and increasing operating profit, to both trailer producers and users. | 174,000.00 | 156,000.00 | 152,000.00 | 0.00 | 0.00 | 482,000.00 | MAXITRANS INDUSTRIES LIMITED, AUSTRALIAN NUCLEAR SCIENCE AND TECHNOLOGY ORGANISATION |

National Interest Test Statement

Freight transport plays a pivotal role in Australian economy. Besides rail and sea transports, over three quarters of Australia's non-bulk freight is carried on roads. Truck trailers are the most important load bearing structures in the road freight transport exercises. Subjected to cyclic loading, trailers are failures eventually due to fatigue crack growth. This project aims to develop a damage tolerance approach in designing and maintaining heavy-duty truck trailers to replace current out-dated static strength based design approach. This project supported by Australia's largest trailer producer will revolutionize current design and maintenance practices for truck trailers. The application of the damage tolerance approach will prolong the life cycle of truck trailers, reduce the trailer tare weights and bring huge economic benefits to both trailer producers and trailer users.

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Approved Organisation, Leader of Approved Research Program	Approved Research Program	Estimated and Approved Expenditure ($)			Indicative Funding ($)		Total ($)	Partner Organisation(s)
		2020-21 (Column 4)	2021-22 (Column 5)	2022-23 (Column 6)	2023-24* (Column 7)	2024-25* (Column 8)	(Column 9)	(Column 10)
(Columns 1 and 2)	(Column 3)							
LP200100296 Raven, Prof Dr Rob	This project aims to help cities and urban regions reach net zero emissions by taking the precinct as an optimal scale for urban transition. This project expects to co-create a new approach grounded in transition management and design anthropology. This will be tested in an action-oriented case study in the Monash Technology Precinct through three Living Lab experiments across energy, mobility and buildings. Expected outcomes include a validated approach for net zero transitions that delivers to the real-life experiences of the precinct community of business, government, knowledge institutes and civil society. This should provide significant benefits to industry seeking to enhance community engagement for accelerating urban transitions.	261,562.00	279,912.00	277,244.00	204,290.00	0.00	1,023,008.00	ENGIE SERVICES AUSTRALIA PTY LIMITED, MONASH CITY COUNCIL, LOCAL GOVERNMENTS FOR SUSTAINABILITY - OCEANIA, CSIRO

National Interest Test Statement

This project expects to create ground-breaking and industry-relevant, cross-sector knowledge by delivering an applied approach to the transition of urban infrastructures at precinct scale. There will be three expected national benefits: 1) delivery of a framework for urban transition management that aligns with community interests and provides guidance tailored to local, state and federal government, and other policy actors with commitments to net zero; 2) creation of integrated urban solutions in energy, mobility and buildings that enable industry and government to standardise, commercialise and scale the outcomes of the project to other precincts; 3) transferring social and economic benefits to the broader community that improve the liveability and prosperity of our cities as a result of accelerating net zero urban transitions. This will significantly impact the value and resilience of future investments in urban infrastructures and create opportunities to grow domestic jobs and exports.

LP200100372 Segrave, A/Prof Marie T	This project aims to investigate the operation of the Family Violence Provision (Migration Regulations (Clth) 1994), designed to act as a safety net for women on temporary visas whose relationships break down due to family violence. The project expects to generate new knowledge about awareness and application processes and outcomes. Using a multi-method approach this will be the first study to examine the operation of the Provision. The outcomes will offer direct benefit to the Partner Organisations, and to national stakeholders providing support to migrant women. The project is expected to strengthen support for women who have experienced family violence for whom this provision was designed.	99,894.00	87,748.00	83,885.00	0.00	0.00	271,527.00	INTOUCH MULTICULTURAL CENTRE AGAINST FAMILY VIOLENCE, WESNET (WOMEN'S SERVICES NETWORK) INCORPORATED, HARMONY ALLIANCE: MIGRANT AND REFUGEE WOMEN FOR CHANGE

National Interest Test Statement

The Council of Australian Governments' [COAG] Fourth National Action Plan on Violence Against Women has identified that women from diverse cultural and visa status backgrounds require specific support in the context of family and domestic violence. This includes tailored service provision, and targeted immigration support. This project is designed to directly support COAGs commitment to enhancing women's safety. It will be the first study to focus on the Family Violence Provision [FVP], which allows eligible partner visa applicants to leave a violent relationship without the risk of losing their right to apply for permanent residence in Australia. The findings aim to support the FVP to achieve the stated intent of protection for women. The research will contribute important knowledge to best practice nationally and internationally to supporting migrant women experiencing family violence.

LP200100540 Porter, Prof Chris J	This project aims to build on a highly successful collaboration between the Australian biotechnology company Starpharma and Monash University, to better understand the design of next generation nanomaterials that home to specific target cells. The project seeks to capitalize on recent advances in dendrimer chemistry and protein engineering to explore the design of nanomaterials linked to engineered antibody fragments. The anticipated goal is attainment of exquisite, cell specific targeting affinity. Targeted nanomaterials have the potential to transform the clarity of imaging technologies; to facilitate the design of sensors and diagnostics that detect biochemical change in highly select cell populations and to revolutionise drug delivery.	133,000.00	135,000.00	165,000.00	0.00	0.00	433,000.00	STARPHARMA PTY LTD

* Note - Indicative funding for approved projects will be made available through a funding variation under section 54 of the ARC Act

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Approved Organisation, Leader of Approved Research Program	Approved Research Program	Estimated and Approved Expenditure ($)			Indicative Funding ($)		Total ($)	Partner Organisation(s)
		2020-21 (Column 4)	2021-22 (Column 5)	2022-23 (Column 6)	2023-24* (Column 7)	2024-25* (Column 8)	(Column 9)	(Column 10)
(Columns 1 and 2)	(Column 3)							

National Interest Test Statement

This project will harness the expertise, infrastructure and capabilities of Monash University to support expansion and enhancement of Australia's technology and intellectual property base in advanced biomedical manufacturing. More specifically the program will generate an improved fundamental understanding of interactions at the interface of polymer chemistry and synthetic biology, allowing accelerated development of hybrid nanostructures in fields including next-generation imaging, sensors and delivery vehicles. These new materials have the potential to revolutionise the field of biomedical engineering, where Australia is emerging as a world leader. The outcomes from the project will support economic growth and commercial success of the commercial partner, Starpharma, and will promote broad development, employment and training opportunities in a new platform technology, thereby expanding the national science base in macromolecular biotechnology. This is particularly vital in this time of economic uncertainty, where maintaining and developing high-value manufacturing is critical.

| | Monash University | 805,235.00 | 837,944.00 | 813,331.00 | 204,290.00 | 0.00 | 2,660,800.00 | |

RMIT University

| LP200100029 Mitchell, Prof Arnan D | This project aims to create a new class of optical inertial movement sensors using integrated photonic chip technology. By replacing optical fibre coils with compact waveguides, integrating light sources on-chip and by harnessing smart sensing approaches, we intend to reduce the required power from watts to milliwatts and reduce the dimensions from meters to centimetres. The expected project outcomes are sensors with military grade precision but with the size, cost and manufacturability of consumer electronics. This technology will fill a strategic gap in the movement sensor market enabling applications ranging from robotic infrastructure monitoring, manufacture and surgery to guiding satellites and other space craft. | 209,656.00 | 216,816.00 | 220,415.00 | 0.00 | 0.00 | 646,887.00 | ADVANCED NAVIGATION PTY. LTD. |

National Interest Test Statement

This project will create photonic chip based inertial movement sensors with military grade precision but with the size, cost and manufacturability of consumer electronics. The global market for inertial movement sensors, suitable for guiding autonomous vehicles, is expected to reach US$13.7b by 2024. Current commercial solutions either lack the precision or are too bulky and costly to address this market. This project will address this problem and create significant commercial opportunities. The created intellectual property and sensors have a high potential for commercialisation, which will be explored in collaboration with our industry partner Advanced Navigation. The project will also support the establishment of a high-tech manufacturing capability to manifest Australia's leading role in industry 4.0. Other expected benefits of this project will be a greater adoption of photonic technologies in Australian products and quicker innovation cycles, particularly for applications in sensing, spectroscopy, digital communications and quantum technologies.

| LP200100054 McQuilten, Dr Grace M | This project aims to strengthen the visual art industry's economic ecosystem. In a context where artists' incomes are low and falling, commercial galleries are financially vulnerable and public galleries face funding challenges, the project addresses barriers to the sector's economic health and the challenge of improving artists' incomes. To address this critical gap, the project will combine an analysis of current value chains and emergent forms of economic organisation with qualitative insights into the experiences of artists and arts professionals. It will propose interventions for arts industry and government policy to improve and develop this ecosystem. Benefits include improved incomes for arts workers and a sustainable arts industry. | 105,267.00 | 121,402.00 | 113,183.00 | 0.00 | 0.00 | 339,852.00 | NATIONAL ASSOCIATION FOR THE VISUAL ARTS LTD, AUSTRALIAN MUSEUMS AND GALLERIES ASSOCIATION |

National Interest Test Statement

The impact of this national study will be significant - increasing the quality of life and working conditions of artists and arts professionals in Australia and elevating the standards of the industry. The research project centres on the practical question of what we can do to improve incomes and working conditions in the Australian visual arts sector today. In so doing, it addresses the complex relationship between the economic health of the visual arts sector broadly and the individual incomes and working conditions of artists and arts workers. By mapping current value chains and proposing interventions for industry and government to strengthen the visual arts economic ecosystem, it will provide (i) practical and implementable actions for local, state and federal government arts departments and policy advisors, arts funders, peak bodies, dealers, gallerists and arts organisations, and (ii) economic and social benefits for emerging and professional artists, curators, arts workers, artist-run initiatives, galleries, arts centres and the visual arts sector as a whole.

| | RMIT University | 314,923.00 | 338,218.00 | 333,598.00 | 0.00 | 0.00 | 986,739.00 | |

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(Columns 1 and 2)	(Column 3)							

Swinburne University of Technology

LP200100052 Arulrajah, Prof Arul	This project aims to develop biocements with recycled sand and demolition wastes as road construction materials. The usage of these low-carbon waste materials in pavement projects can significantly reduce carbon emissions and costs. This research expects to generate new knowledge on the performance of recycled wastes in roads, when subjected to high traffic loads using experimental, numerical approaches and field trials. Expected outcomes include evaluating and modelling the performance of biocements and demolition materials in roads, and building enduring collaborations with industry. Benefits include: diversion of wastes from landfills, reduction in carbon emissions and the potential commercialisation of recycled wastes for road projects.	123,000.00	174,000.00	145,000.00	0.00	0.00	442,000.00	REPURPOSE-IT PTY LTD, STRETFORD CIVIL CONSTRUCTIONS PTY LTD, CHAIYONG KAMAI CO. LTD

National Interest Test Statement

This project will benefit Australian waste management and road construction industries by opening new markets for recycled sand, washed demolition materials and biocement as road construction materials. This project will offer alternative, 'environmentally friendly' road construction materials incorporating demolition waste by-products and an environmentally-friendly biocement binder, with significantly reduced carbon footprint and longer lifespan than traditional road construction materials. National benefits arising from this research include: (a) carbon savings by the diversion of 20 million tonnes of demolition wastes annually from Australian landfills, (b) further environmental preservation by reducing 50% of carbon emissions with the usage of novel biocement as an alternative pavement binder, (c) significant reduction in the need for quarry materials, (d) economic benefits in terms of cost savings by eliminating long-haul transportation of depleting quarry resources (~ $ 48 million/annum), and (e) opening new markets for Australia's waste management and road construction industries.

	Swinburne University of Technology	123,000.00	174,000.00	145,000.00	0.00	0.00	442,000.00	

The University of Melbourne

LP200100381 Walsh, A/Prof Christopher W	Rivers and streams provide invaluable ecosystem services, yet are commonly degraded by human activities: a problem likely to be exacerbated by thermal and flow regimes being altered by climate change. Stream biodiversity is both a value and an indicator of ecological health: effective stream management requires prediction of biodiversity responses to natural environmental and human-impact gradients. By compiling a dataset of macroinvertebrate species using new DNA metabarcoding, modelling their distributions, and ranking biodiversity by reach, we will develop molecular and quantitative spatial tools to provide data-driven, landscape-scale decision support for protecting and restoring streams: an urgent need for stream managers globally.	158,754.00	179,216.00	88,020.00	69,830.00	0.00	495,820.00	MELBOURNE WATER CORPORATION

National Interest Test Statement

Streams and rivers are vital resources for Australia and the world, but urbanisation and agriculture, compounded by climate change, are causing reduced water quality and quantity, and large biodiversity losses. Arresting the global decline of rivers requires novel solutions including sensitive, informative and cost-effective tools for waterway management. This project will use new DNA approaches to efficiently identify freshwater invertebrate species (excellent indicators of stream health) and combine this with new high-resolution environmental data for streams and rivers to model species distributions and prioritise management interventions that will maximise biodiversity. These research tools will enable scenarios of stream and catchment management actions to be explored and prioritised, allowing stream managers to quantify trade-offs and choose the most cost-effective management actions to protect and improve stream health and biodiversity, placing Australia in a leading position to understand and minimise human and climate change impacts on freshwater ecosystems using invertebrate species biodiversity.

	The University of Melbourne	158,754.00	179,216.00	88,020.00	69,830.00	0.00	495,820.00	
	Victoria	1,757,302.00	2,010,011.00	1,771,046.00	324,120.00	0.00	5,862,479.00	

Approved Organisation, Leader of Approved Research Program	Approved Research Program	Estimated and Approved Expenditure ($)			Indicative Funding ($)		Total ($)	Partner Organisation(s)
		2020-21 (Column 4)	2021-22 (Column 5)	2022-23 (Column 6)	2023-24* (Column 7)	2024-25* (Column 8)		
(Columns 1 and 2)	(Column 3)						(Column 9)	(Column 10)

Western Australia

The University of Western Australia

| LP200100225 Powles, Prof Stephen B | This project aims to investigate the role of the cell membrane in synthetic auxin herbicide resistance by analysing the functions and interaction partners of candidate resistance proteins. It is expected that this project will generate new knowledge about the very early response of plants to auxin and the difference between susceptible and resistant weeds in perceiving auxin herbicides. Expected outcomes of this project include the identification of potential herbicide synergists and a greater understanding of how weeds develop resistance to auxin herbicides. This should benefit Australian grain growers by providing more effective weed control options and lessening the amount of unnecessarily-applied herbicide in the environment. | 121,749.00 | 121,749.00 | 121,749.00 | 0.00 | 0.00 | 365,247.00 | NUFARM AUSTRALIA LIMITED |

National Interest Test Statement

The proposed research has the potential to economically benefit Australia's grain growers and exporters by providing a means of preserving the longevity of the auxinic herbicides, allowing more effective weed control and thus higher crop yields and grain quality. This is especially important if glyphosate, the world's safest and most effective herbicide, is banned in Australia through societal pressure. With more efficient use of auxinic herbicides, farmers will also save money, water and fuel during the growing season, and less herbicide residue will make its way into the surrounding environment. There is also potential commercial benefit for Australia's agrichemical industry, with the knowledge generated in this project ultimately leading to the development of more effective weed control packages tailored to Australian weeds and cropping systems.

| LP200100341 Lambers, Em/Prof Johannes (Hans) T | Using unique core collections of chickpea, soybean and peanut with diverse genetic backgrounds, this project aims to unravel the mechanisms underlying high phosphorus-use efficiency (PUE) at morphological, physiological, biochemical and molecular levels in three major legume crops. Reduced levels of phosphorus and phytate in seeds will improve seed quality for humans and livestock and dramatically reduce phosphorus-fertiliser inputs. The identification of traits and genes associated with high PUE will allow transfer of key traits into commercial cultivars using molecular breeding approaches. Cultivars with improved PUE will enable reduced phosphate fertiliser input and loss of phosphate in runoff from agricultural systems. | 170,000.00 | 170,000.00 | 170,000.00 | 140,000.00 | 0.00 | 650,000.00 | INTERNATIONAL CROPS RESEARCH INSTITUTE FOR THE SEMI-ARID TROPICS, CHINA AGRICULTURAL UNIVERSITY, SHENYANG AGRICULTURAL UNIVERSITY, MINGENEW IRWIN GROUP, GUANGZHOU DEBAI AGROTECH CO. LTD., YINGKOU MAGNESITE CHEMICAL IND GROUP CO. LTD |

National Interest Test Statement

The intended outcome of the project is to offer a range of physiological traits and new genes to improve phosphorus-use efficiency of grain legumes (chickpea, soybean and peanut). The development of grain legume genotypes with low seed phosphorus and phytate concentrations will reduce phosphorus-fertiliser inputs, and significantly improve human and livestock nutrition by reducing binding of micronutrients by phytate (rendering them unavailable for ingestion) whilst also reducing environmental pollution due to phosphorus excretion. Newly identified genes and traits will be invaluable in the screening of large breeding populations and development of more phosphorus-efficient cultivars. The information developed for chickpea, soybean and peanut will likely be applicable to other crop legumes, thus benefiting global legume production through lower fertiliser input and reduced environmental impact from phosphorus movement off farm. The ultimate benefits will accrue to farming communities, consumers of grain legumes and society in general through economic, health and environmental benefits.

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		2020-21 (Column 4)	2021-22 (Column 5)	2022-23 (Column 6)	2023-24* (Column 7)	2024-25* (Column 8)		
(Columns 1 and 2)	(Column 3)						(Column 9)	(Column 10)
LP200100483 Fraser, Dr Matthew W	This project aims to investigate the resilience of the Shark Bay World Heritage Site to projected climate change. This project will generate new knowledge for marine conservation through analyses of habitat loss on nutrient budgets and productivity in seagrass and microbialite ecosystems. Expected outcomes are an improved understanding of climate-driven shifts on ecosystem processes in Shark Bay, incorporating science-based evidence for better conservation and management. This will provide significant benefits by contributing to the future-proofing of Shark Bay's World Heritage values to climate change, and more broadly by demonstrating the consequences of the continued tropicalisation of Australia's coastline.	134,025.00	114,465.00	75,516.00	0.00	0.00	324,006.00	BUSH HERITAGE AUSTRALIA, DEPARTMENT OF BIODIVERSITY CONSERVATION AND ATTRACTIONS

National Interest Test Statement

Shark Bay, like other marine ecosystems, has undergone significant changes such as habitat loss and fisheries collapse resulting from ocean warming events. These threaten the substantial ecosystem functions and ecosystem services this World Heritage Site provides, making Shark Bay an ideal model ecosystem to understand likely ecosystem-wide responses to future climate change. This research will generate significant knowledge that will allow us to understand and better plan for future changes in Shark Bay and contribute to the management of this iconic ecosystem. This project will significantly enhance national and international collaborative research and foster independent thinking and development of graduate students. This project will benefit local stakeholders – fisheries, landowners, tourists, and Indigenous communities – as well as the broader community through changing how we manage the resources and services Shark Bay and similar seagrass ecosystems support. Outcomes will be applicable to other marine ecosystems where habitat-forming foundation species are predicted to be lost due to climate change.

LP200100547 Small, Prof Ian D	Hybrid wheat varieties yield 10-15% more than conventional lines but a cost-effective system to produce hybrid seeds on a commercial scale is missing. This project aims to deliver such a system for use in hybrid wheat breeding programmes. The outcome will be ultimately higher wheat yield gains in Australia and worldwide. Higher and more stable yields will contribute to higher food security for the growing human population.	221,321.00	215,109.00	224,609.00	0.00	0.00	661,039.00	GROUPE LIMAGRAIN – VILMORIN & CIE, AUSTRALIAN GRAIN TECHNOLOGIES PTY LTD

National Interest Test Statement

Wheat makes an important contribution to the Australian economy both regionally and nationally, but yields vary greatly from year to year (from 2.6 tonnes per hectare harvested in 2017 to only 1.6 forecast for 2020). Hybrid varieties are expected to show higher and more stable yields, as seen in other crops such as maize and canola. This project will provide the capability to develop a breeding system for creating hybrid wheat varieties to take advantage of this promise. The economic benefit of modern wheat hybrid varieties tailored to the challenges of the Australian climate should be substantial. The approach taken in this project will be transferable to other cereals such as barley and sorghum, two other major staples that contribute to Australian agricultural exports. The social benefit of these discoveries will ensue through more sustainable yields which will guarantee better food and market security in the future. In addition, this project will strengthen collaborative activities between major wheat breeding companies in Europe and Australia.

LP200100590 Ju, Prof Li	Groundwater is vital in many parts of Australia due to low surface water availability while much of Australia's mineral wealth is obscured by conductive cover. Airborne surveys are key to mapping minerals and water over large areas. This project aims to enhance the resolution of airborne electromagnetic surveying technology by developing advanced new aircraft transmitters and receivers. The project expects to enable complex groundwater structures to be mapped more accurately and increase the depth to which conductive ore bodies can be detected. Expected outcomes include the discovery of new economic mineral and water resources. This should provide significant benefits to the mining and agricultural industries.	155,000.00	155,000.00	155,000.00	0.00	0.00	465,000.00	CGG AVIATION (AUSTRALIA) PTY LTD

National Interest Test Statement

The mining industry is an important part of the Australian economy but the rate of discovery of new economic deposits has been declining for decades. This is partly because of the difficulty in exploring for buried deposits under conductive overburden which covers much of Australia. This project aims to increase the ability of airborne electromagnetic surveying to map under conductive cover and look deeper into the Earth. The anticipated goal is a greater probability of discovery of new economic mineral and hydrocarbon resources that could contribute strongly to the Australian economy. Due to low surface water availability, groundwater is vital in many parts of Australia and can act as a strategic reserve in times of drought. Groundwater depletion and salinisation are serious problems affecting numerous areas. The project aims to enable airborne electromagnetic surveys to map complex groundwater structures at significantly higher resolution. This could help water-resource managers develop efficient water management plans and identify new groundwater resources.

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(Columns 1 and 2)	(Column 3)						(Column 9)	(Column 10)
	The University of Western Australia	802,095.00	776,323.00	746,874.00	140,000.00	0.00	2,465,292.00	
	Western Australia	802,095.00	776,323.00	746,874.00	140,000.00	0.00	2,465,292.00	
		8,271,547.00	**8,725,049.00**	**7,697,529.00**	**1,422,241.00**	**345,635.00**	**26,462,001.00**	

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