PREMIER'S CLIMATE CHANGE COUNCIL

SA CLIMATE LEADERS AWARDS

WINNERS AND FINALISTS

2022

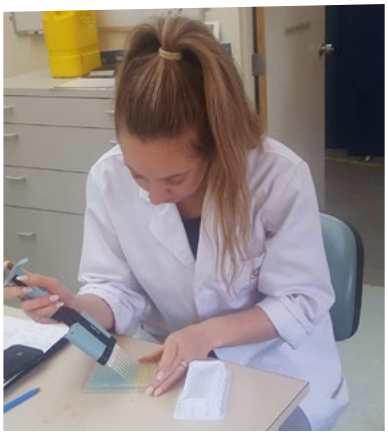
SOUTH AUSTRALIA

Government of South Australia
Premier's Climate Change Council

BOBBIE LEWIS BAIDA

Investigating the impact of climate change on Australian sheep production

OVERALL WINNER AND RESEARCH & EDUCATION CATEGORY



"The future impacts are already here, the technology exists, and it's time to act…""

Bobbie Lewis Baida,
PhD candidate, University of Adelaide

Bobbie is researching ways for Australia's multi-billion-dollar sheep industry to build resilience to animal heat stress and mitigate the potential production impacts from more frequent hot weather.

Heat stress occurs when a sheep generates more heat than it can dissipate. Heat stress can adversely impact the animal's welfare and reduce its fertility. Bobbie explains that a 1°C increase in global temperatures has the potential to decrease lambing rates by up to 20% in some areas of Australia, equating to financial losses of almost $97 million each year.

This novel work is taking scientific research from the lab and out into the field. Building on the body of research about the effects of heat exposure on livestock conducted in climate-controlled chambers, Bobbie is using non-invasive technology to remotely monitor free-ranging Merino ewes and rams experiencing natural heat exposure.

Combining heat-sensing technology with on-farm weather data, Bobbie seeks to quantify the impact of rising temperatures on grazing sheep, including welfare, reproduction and lamb growth and development.

Through her research, Bobbie is gaining a better understanding of the physiological and behavioural factors involved in how sheep experience heat stress. This includes the thermal tolerance of individual animals, sheep movement patterns and how sheep use available resources. She hopes her work will inform the development of new products and processes to help secure the sheep industry through the implications of climate change.

The judges were impressed by this innovative research, and consider it critical to preparing for, and building resilience to, the impacts of climate change in the livestock industry.

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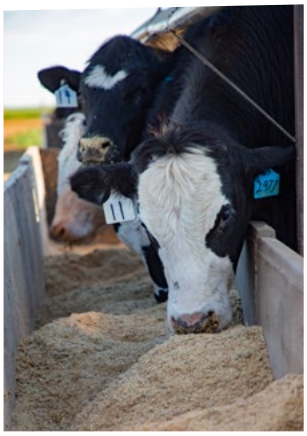
CH4 AUSTRALIA

Bending the climate curve: CH4 Australia fights global climate change with novel supplements for cattle using locally grown Asparagopsis seaweed

BUSINESS AND INDUSTRY CATEGORY



"The only way to urgently impact climate change at scale is to approach it as a disruption, not solely product innovation. A key aspect of this global partnership network is our core principle of working with local and indigenous communities for seaweed growing partnerships. "

Steve Meller,
PhD, CEO and Founder, CH4 Global Inc.*

CH4 Australia is gaining international attention on its five-year mission to reduce greenhouse gas emissions from ruminant livestock to positively impact climate change.

It has pioneered an end-to-end process to turn native Asparagopsis seaweed into a feedlot supplement to reduce methane in cattle burps by up to 90%.

It uses aquaculture from both marine and tank-cultivated sources, and is leveraging access to saltwater aquifers to enable production of Asparagopsis hundreds of kilometres from the coast. CH4 Australia plans to use wild seaweed material only for research and seed stocking.

The company processes the seaweed and formulates it into feed supplement products. It embeds sustainability into its practices by partnering with fish producers to use their fish waste in production, repurposing existing facilities, and processing locally.

CH4 Australia is also consulting and collaborating with the Narungga Nation and has plans to roll out a partnership model, merging traditional and technology-aided approaches, to help First Nation communities seeking to enter the industry.

CH4 Australia's early AgTech investment has it poised to scale quickly. It uses opportunities like its recent participation in a Silicon Valley Bank global climate tech trend panel to showcase its innovation.

Methane has 81 times more global warming potential than carbon dioxide over the next 20 years. CH4 Australia is developing a way to significantly reduce enteric methane emissions safely.

**CH4 Australia is a wholly owned subsidiary of CH4 Global, Inc.*

The judges considered the innovation aspects of this project to be impressive and acknowledged the potentially enormous global impact this work could achieve in the future. CH4 Australia's engagement with First Nations was also commended.

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DEIDRE KNIGHT

Education for Sustainability / Climate Action Advocacy

COMMUNITY CATEGORY

"The Seeds for Change program has been an outstanding example of community engagement and action at work. Future work will be vital to improve what is still an area transitioning from an industrial past to a more residential and family-centred future."

Councillor Kat Mitchell,
City of Port Adelaide Enfield

Through collaboration and direct grass-roots actions, Deidre Knight works with the community to engage in meaningful climate action through localised biodiversity initiatives. Deidre drew on her Living Smart and environmental management credentials, and her Australian Association for Environmental Education SA (AAEE-SA) colleagues, to develop programs to engage schools and communities in local climate action.

Seeds for Change Ottoway

Deidre engaged residents in Ottoway to grow endemic plant species from seed and cuttings to revegetate the neighbourhood. Through backyard nurseries and propagation workshops, the community grew 2,500 seedlings and planted 1,000 on council land. The remainder were distributed to residents free of charge.

The project brought together residents, state and local council, community leaders and local organisations to help create a more climate-resilient suburb that increases biodiversity while cooling Ottoway.

"Bring Back the Butterflies" and "Kaurna Food and Plant Fibre", St Joseph's Hindmarsh School

Deidre and AAEE-SA drew on the cross-cultural appeal of butterflies to raise awareness of the role of local butterflies in the ecosystem, and to engage the community in growing 1,500 butterfly, bee and bird-attracting plants.

Deidre now works with the St Joseph's community and Kaurna elders to help students understand and grow plants traditionally used by Kaurna people for food, fibre and medicine. Interactive signage will mark the school gardens as part of an emerging nature trail.

Bring Back the Butterflies" is available as a curriculum resource from the Australian Association for Environmental Education Inc website.

The judges acknowledged Deidre's work in building awareness around ways to address climate change through biodiversity projects in urban communities, and delivering authentic, grassroots actions with great community engagement.

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SA WATER

Zero Cost Energy Future: shaping a sustainable energy future for SA Water and modelling best practice

GOVERNMENT CATEGORY

"The project is a water industry world first, driven by customer and environmental outcomes, to reduce one of SA Water's largest operational costs and deliver sustainable savings that help maintain low and stable prices for customers.""

Nicola Murphy,
General Manager Strategy, Engagement and Innovation

Through its Zero Cost Energy Future initiative, SA Water is actively working to help minimise the effects of climate change while reducing its reliance on the energy market to achieve operating savings to benefit customers.

SA Water's Zero Cost Energy Future has already seen it achieve considerable benefits from adopting renewable technologies, including saving 89,000 tonnes in annual carbon dioxide emissions. SA Water estimates that the carbon emissions savings are equivalent to planting 7 million trees or removing more than 32,000 cars from the road.

In the past two years, SA Water has installed more than 367,000 solar panels across 33 sites. It now generates up to 242 gigawatt hours, or around 70% of its energy needs from renewable sources, equivalent to producing enough power to service the needs of 50,000 average South Australian homes.

SA Water has also embraced other sustainability measures. This includes sowing one tonne of native grass and saltbush seeds underneath solar panels for weed, dust and heat management and revitalising 360 hectares of wetlands in the Riverland to establish Murbpook Nature Reserve, now a rich natural habitat for 17 threatened species of fauna and two rare flora species.

As it works to achieve its 2030 goals including net zero emissions, 100% self-generated power and net zero waste, SA Water plans to continue sharing its program with similar organisations and companies in the hope of supporting them along their climate mitigation and adaption journey.

The judges acknowledged the large impact and scale of this project, and commended the ambition of SA Water of setting a target of net zero emissions and net zero waste by 2030.

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EXTREME HEAT AND HEALTH ADAPTATION TEAM, UNIVERSITY OF ADELAIDE

Minimising the health impacts of extreme heat in South Australia: Focusing on at-risk populations

THE UNIVERSITY of ADELAIDE

RESEARCH AND EDUCATION CATEGORY






"The research imperative stemmed from the severe consequences and hundreds of deaths from heatwaves across southern and south-eastern Australia in the late 2000s. Through this collaboration, South Australia has led the way for the national adoption of a world-leading heatwave warning system."

Chris Beattie,
Chief Officer SA State Emergency Service

The University of Adelaide's Extreme Heat and Health Adaptation Team is helping to keep the community safer and reduce public health costs associated with extreme hot weather through its Heat and Health Early Warning System.

Heat stress is a well-known threat to public safety, with the resulting human health consequences expected to increase with global warming. Some groups within the community, such as the aged, new arrivals and certain workers are at greater risk during heatwaves.

The team evaluated the impacts of extreme heat on human life, hospitalisations and healthcare costs, and heat risks in occupational settings. It then developed practical workplace guidelines, health education DVDs for culturally and linguistically diverse communities and an information package for older people.

The team's work informed the SA Health Extreme Heat Strategy, and its Work Health & Safety recommendations were adopted by SafeWork Australia. Emergency Management Australia adopted the Heat and Health Early Warning System as a national protocol.

The Heat and Health Early Warning System was independently assessed as a "no-regret public health response to heatwaves" (Williams et al, 2021). The study measured public health and healthcare benefits during a 7-day activation of the system, including reducing related cardiac ambulance callouts and emergency presentations by 59% and 56% respectively, with an estimated saving of more than $2 million in public hospital healthcare costs.

The team's work has resulted in applications of the system in Europe, China, India, Indonesia, and Vietnam.

Williams, S. et al. (2021) Evaluating cost benefits from a heat health warning system in Adelaide, South Australia, Wiley Online Library. NHMRC. Available at: https://onlinelibrary.wiley.com/doi/full/10.1111/1753-6405.13194 (Accessed: October 30, 2022).

The judges acknowledged the importance of this work to help reduce preventable heat stress and its potential for national and global application.

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FLINDERS UNIVERSITY

Climate and climatic variation impact on lymphoedema

RESEARCH AND EDUCATION CATEGORY







"Gathering a multinational team of advisors from the fields of meteorology, biology, clinical, and experimental medicine, Ms Witt has worked out a sound methodological approach to study the complex interplay between climate, health, and disease."

Prof. Dr. med. Thomas Dieterle,
Chief Medical Officer, Foeldi Clinic, Germany

Flinders University, through the work of Ms Susan Witt, who is being supervised by Professor Neil Piller of the College of Medicine and Public Health, is studying how to manage the potential negative health impacts of climate change for people living with lymphoedema.

It is estimated that up to 28 in every 1,000 of the world's population currently experiences lymphoedema, a life-long condition caused by the failure of the lymphatic system resulting in swelling, most commonly in the arms or legs.

The recommended gold standard treatment is the use of compression stockings and bandages. The management of lymphoedema is more difficult during hot or humid weather due to extreme discomfort for the patients. With increasing temperatures, there is a concern that this could lead to treatments not being utilised, and subsequently increased disease progression.

Susan identified major knowledge gaps and a lack of qualitative and quantitative data in the existing research and literature on this topic.

Her next steps are to engage with patients, patient support groups, lymphoedema experts, climate change experts, spatial data experts, and the European Centre of Lymphology to expand the body of knowledge on the effects of a hot climate on chronic oedema.

The information will be used to adapt lymphoedema management approaches. This includes the need to develop new fabrics that provide better ventilation and evaporation, and opportunities to better educate and equip health professionals and patients.

The judges were impressed with this unique submission and acknowledged the importance of this work to provide relief to lymphoedema patients.

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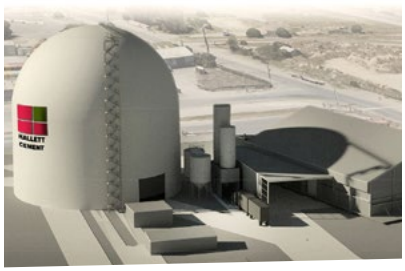
HALLETT GROUP

Green Cement Framework

HALLETT GROUP

Green Cement Transformation

BUSINESS AND INDUSTRY CATEGORY



"In my 40 years in business I have never been more excited about our future and our ability to benefit the community"

Mark Pickard,
Owner of Hallett

Hallett Group's Green Cement Framework plans to embrace the circular economy and utilise 100% demand-managed renewable energy sources to produce low-carbon cement products for the Australian construction industry.

Low-carbon cement uses materials such as fly ash and slag, which are by-products of coal-fired power stations and metals processing respectively, to manufacture products called supplementary cementitious materials (or SCMs) that replace high carbon traditional portland cement.

As traditional SCM sources reduce over coming years with the closure of coal fired power generation, the Hallett green cement project will support locally produced SCM sources to help supply Australia's future green cement needs.

The operation will initially involve 3 sites, with potential to expand to other by-product streams in the future. Fly ash will be extracted from the fly ash dam at Port Augusta, and slag will be provided by the Nyrstar Port Pirie smelter. These products will be ground, processed and distributed at a new Port Augusta manufacturing hub, and through a new product receival, blending and distribution hub in Port Adelaide.

Hallett Group estimates the Green Cement Framework will reduce approximately 350,000 tonnes of carbon dioxide emissions per year initially, with the potential to reduce more than 1 million tonnes per year in the future.

Hallett Group has developed a stakeholder engagement plan and is consulting with the Nukunu people and the wider community to advance the project in line with community and environmental considerations.

The judges considered this initiative a great demonstration of business leadership with the potential for very large impact when fully delivered.

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PLANET ARK POWER

Enabling the transition to a clean energy world through the IKEA Microgrid Project

BUSINESS AND INDUSTRY CATEGORY

"IKEA Australia is excited to be working with such inspirational partners to help shift the dial on clean energy production in Australia. In the future there is the possibility for IKEA to transform itself into an energy provider that can create and sell clean energy, renewable electricity to energy networks."

Jan Garberg,
CEO IKEA Australia / New Zealand, 2017-2021

Planet Ark Power's involvement in the IKEA Microgrid Project has resulted in the development of an energy solution that is expected to deliver low-cost solar power to customers without any upfront or ongoing costs.

The Microgrid Project is a collaborative partnership between IKEA, Planet Ark Power and Epic Energy, with support from SA Power Networks (SAPN) and the South Australian Government. It combines a 1.2 megawatt (MW) rooftop solar photovoltaic installation and on-site 3.3 MW-hour battery storage aimed at preventing 890 tonnes of carbon dioxide from entering the atmosphere each year.

The battery utilises eleXsys technology to solve voltage disturbance problems, and maintain the line voltage and frequency within safe operating limits. The technology also allowed the hosting capacity of the network to increase, with the permitted solar system capacity being increased from 640 kilowatts to 1.2 MW. This allowed all available roof space to be used to offset 70% of the electricity requirements previously supplied by the grid.

The system was aided by Planet Ark Power's innovation in finding a way to charge batteries from surplus solar across property boundaries whilst remaining fully compliant with the National Electricity Rules.

Planet Ark Power describes the inclusion of the eleXsys energy management system as the link that makes the IKEA Microgrid Project so innovative. This technology solution helps to ensure the certainty of revenue streams from exporting surplus solar energy and grid stability services into the grid whilst meeting network requirements.

The judges acknowledged the innovative nature of this initiative, in the unique pairing of solar, batteries and energy management systems to optimise benefits, and the collaboration shown by the parties involved.

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MACCY BIOCHAR

Making and using carbon-negative biochar on the farm

COMMUNITY CATEGORY

"We have enthusiastic volunteers who source, gather, cut and prepare wood for pyrolysis into biochar. We enjoy the company of others while we act to make a real, practical improvement in our carbon footprint."

David Reynolds,
Member, Maccy Biochar Committee

Volunteer community organisation Maccy Biochar is showing local residents that they can play an active part in the global response to climate change by producing and selling biochar.

Biochar is a charcoal-like substance made from organic waste. Rather than allowing organic waste to naturally decompose and return stored carbon dioxide to the atmosphere, it is burned in a low-oxygen process called pyrolysis to produce biochar. Much of the carbon from the carbon dioxide absorbed by the organic waste is trapped in the biochar, which is then buried to act as a soil improver.

Volunteers burn local wood bio-waste in simple kilns and the biochar is sold to local councils, retailers, commercial farmers and home gardeners.

Since its establishment in 2019 by the Macclesfield Community Association Inc., Maccy Biochar has produced 45,000 litres of raw biochar which equates to preventing 24 tonnes of carbon dioxide from entering the atmosphere[1].

Maccy Biochar is also educating the wider community on the benefits of producing and using biochar and has so far inspired two more Adelaide Hills resident groups to replicate the business model.

[1]*Provided by Maccy Biochar based on independent analysis of Maccy Biochar by Bygen Pty Ltd available at https://www.maccybiochar.com/char-analysis, viewed 4 November 2022.*

The judges considered this to be a great example of volunteers working towards local responses to climate issues.

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ARON HAUSLER

DEPARTMENT FOR INDUSTRY, INNOVATION AND SCIENCE

CivTech Alliance: Global Scale-Up Program

Government of South Australia

Department for Industry, Innovation and Science

GOVERNMENT CATEGORY

"Addressing the climate emergency will require a Think Global, Act Global mindset, as thinking and acting locally is part of the reason we are facing this dilemma today"

Aron Hausler

The Department for Industry, Innovation and Science is helping to accelerate the global growth and impact of Net Zero and Climate Tech companies through the CivTech Alliance: Global Scale-Up Program.

The Program brings together more than 17 leading GovTech and CivTech innovation programs from around the world, and is based on the premise that climate solutions developed in one country will have applications and markets in others.

In its first year, 18 companies from nine countries were chosen to participate in a seven-week 'Scale-Up Safari', to then showcase their solutions at the United Nations 26th Climate Change Conference of the Parties (COP26). In 2022, 16 companies from 12 countries, including two from South Australia, participated in the Safari and presented at COP27 in Egypt.

Participants engaged with policymakers, procurers, investors, sustainability researchers and innovators from the Alliance member countries with a view to scaling their climate tech solutions globally.

For example, the program in 2021 helped XDI Systems in South Australia to secure global investors and customers, and accelerate their growth towards 100 staff.

The Program is not only contributing to global climate change efforts, it is strengthening South Australia's international reputation as a climate tech innovation leader and creating new pathways to directly engage, accelerate and connect the local climate tech sector into global markets.

Aron Hausler is a co-founder of the CivTech Alliance Global Scale-Up Program and South Australia's lead in the CivTech Alliance.

The judges considered the program to be a great example of global collaboration and an excellent initiative to showcase South Australia's innovation and leadership.

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MURRAYLANDS AND RIVERLAND LANDSCAPE BOARD

Living Landscapes: returning functionality to the South Olary Plains

LANDSCAPE SOUTH AUSTRALIA MURRAYLANDS AND RIVERLAND

GOVERNMENT CATEGORY

"By...closing the dams, we're not drying this landscape out, we're helping it to recapture that precious water, through the soil to the vegetation.""

Craig Gillespie,
Senior Ecologist, Murraylands and Riverland Landscape Board

The Murraylands and Riverland Board is leading large-scale collaborative cross-border conservation action to restore the delicate balance of the vast Mallee ecosystem to help it adapt to the impacts of climate change.

Spanning an area twice the size of Kangaroo Island, the Mallee sits north of the Riverland and has been significantly altered by its commercial grazing past. Long-term ecological effects include the impact of dams on natural water distribution and a rise in feral animal populations which threaten native flora and fauna.

The Board's Landscape Ecology team is working with neighbouring landowners in South Australia and New South Wales, non-government and research organisations, First Nations and local community groups. Collaborative measures include removing permanent water sources, managing feral animal populations and collecting, storing and propagating seeds.

There are already signs of renewal. The Board explains that removing dams has reduced the number of feral rabbits, goats and kangaroos resulting in revegetation and a rise in the number of threatened Mallee birds. The project is also helping to increase carbon stored in the landscape and offset greenhouse gas emissions, and strengthen fire management programs through a deeper understanding of the interaction between fire, plants and wildlife.

By restoring this unique woodland to its natural state, the ecosystem will be more resilient to the impacts of climate extremes and better able to recover from events such as drought to help it survive into the future.

The judges considered this initiative was a great example of land restoration with broader climate resilience benefits.

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