

# Reducing methane emissions and improving profitability in Northern Australian beef cattle - update 12/09/2023



# Objectives

1. Investigating whether grazing heifer methane emissions levels are highly correlated to grazing cow methane emission levels
2. Determining the relationships between feed efficiency and feed intake and methane emissions levels in northern Australian cattle.
3. Developing a genomic reference population for methane emission levels.
4. To release research breeding values (in collaboration with the Animal Genetics and Breeding Unit (AGBU) and later as BREEDPLAN breeding values for methane related traits. As well as improve selection indices to achieve methane abatement while improving beef cattle productivity by 30 June 2027.
5. To combine data with the southern multi-breed methane EBV project, in a large multi-breed analysis, to assess whether a single multibreed methane GEBV for Australia is possible

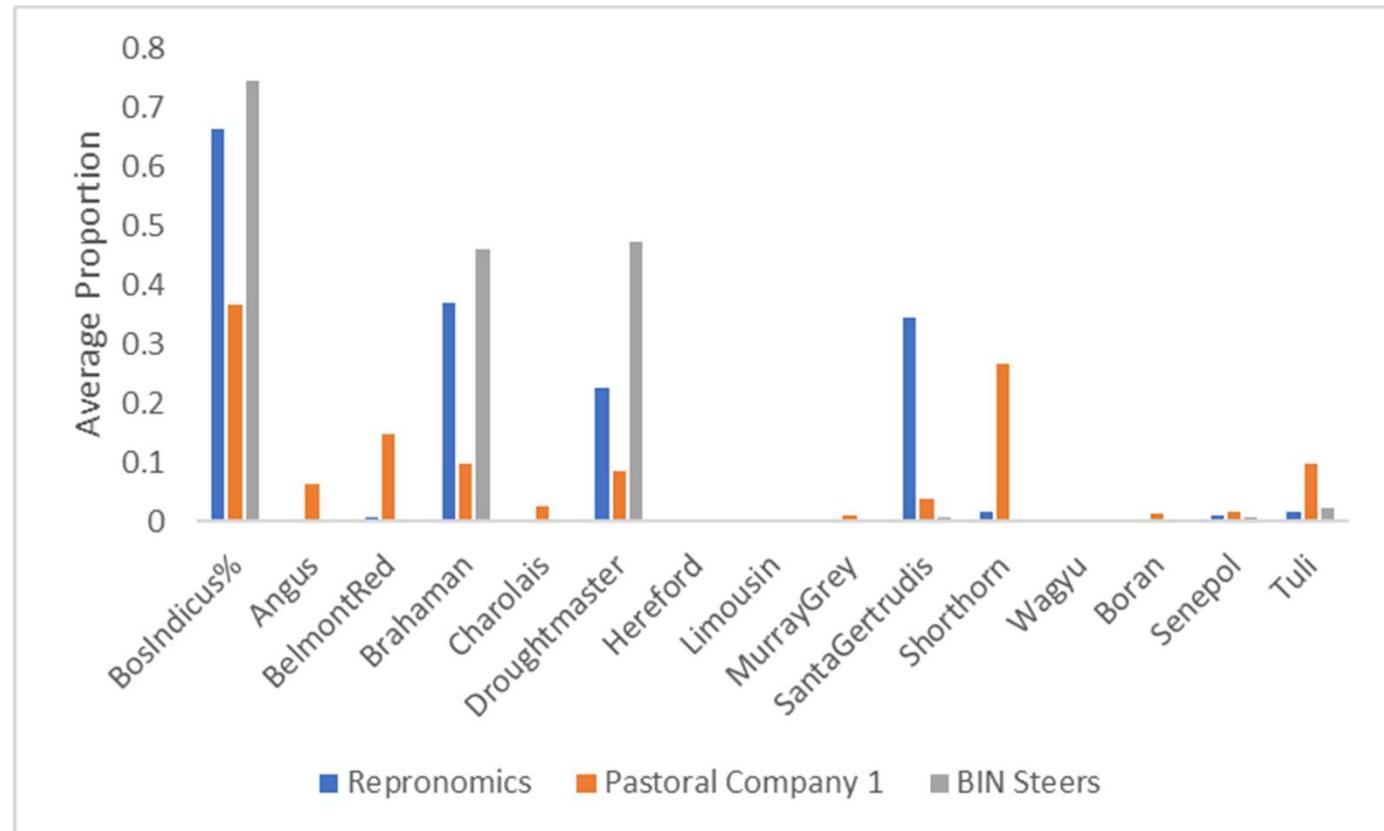
# A reference population for Northern Beef Cattle

- 4500 Animals phenotyped and genotyped
- Repronomics heifers and cows
- Brahman & Droughtmaster BIN steers
- Pastoral1 heifers, bulls and cows
- Pastoral2 heifers, bulls



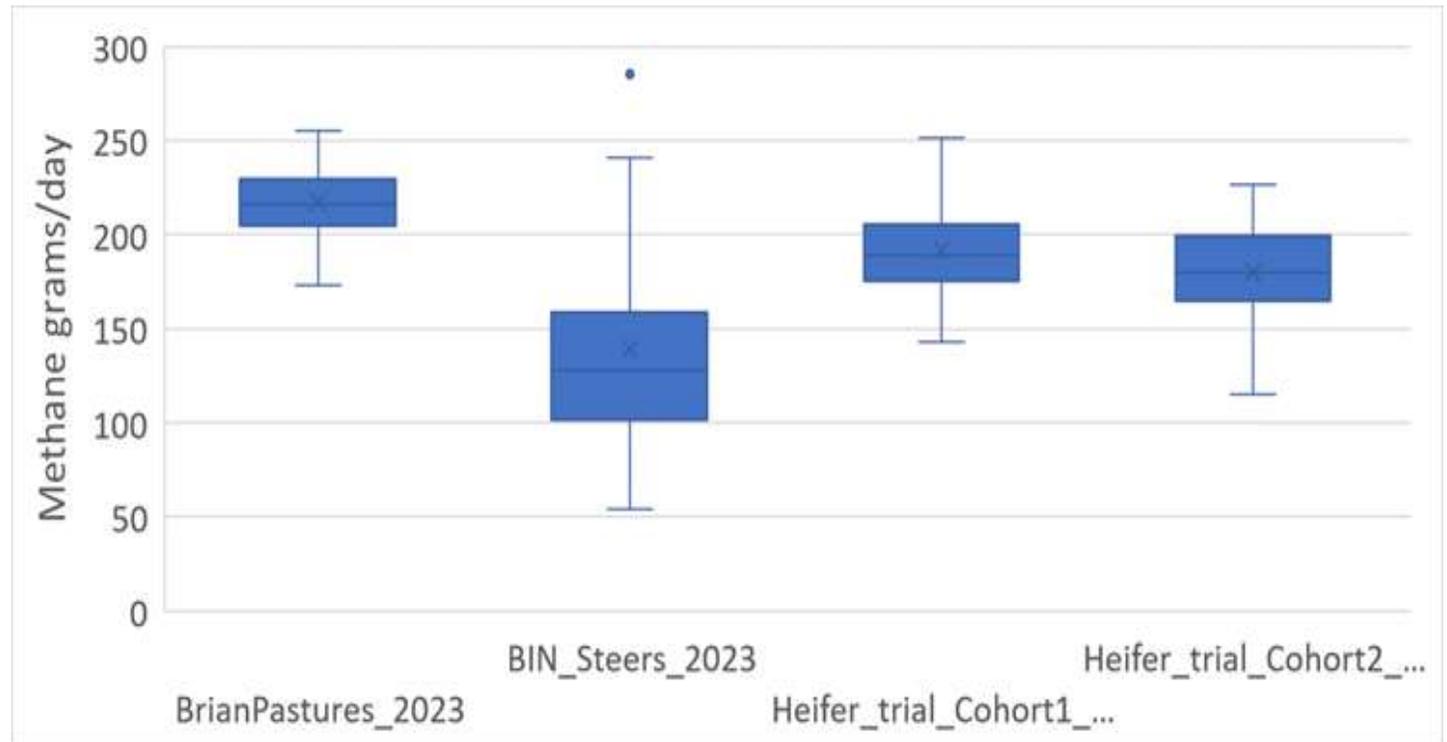
# Progress

- 150 Pastoral1 heifers measured at pasture
- 60 BIN steers (Brahman and Droughtmaster) measured in feedlot (T2 ration)
- 150 Repronomics Heifers @ Brian Pastures
- All genotyped



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# Progress

- Correlations with Feed efficiency (Residual Feed Intake)

Trait	Units	Corr with Residual Feed Intake	Std error
Methane	Methane g/day	0.31	0.14
Methane yield	Methane g/day/Kg DMI	0.17	0.14
Methane intensity	Methane g/day/kg LWT	0.32	0.14

# Progress

- Very preliminary heritability estimate
- Methane (g/day) = cohort + weight + BI + machine + age + animal + e
- Animal  $\sim N(0, \mathbf{G}\sigma^2)$
- $h^2 = 0.42 \pm 0.62$

## Conclusion

- Northern methane project underway
- Four years of screening ahead
- Product will be EBV for methane emissions, select for low emission herds
- Index to weight traits appropriately
- Thanks to Tim Grant, David Johnston, Bradley Taylor and DAF staff. Milou Dekkers and Scott Cullen





# Zero Net Emissions From Agriculture CRC



<https://zneagcrc.com.au/>

ZNEAgCRC.com.au

# Acknowledgement of Country

The Zero Net Emissions from Agriculture CRC (ZNE-Ag CRC) acknowledges the Traditional Owners and their custodianship of the lands on which we meet.

We pay our respects to their Ancestors and their descendants, who continue cultural and spiritual connections to Country.

We recognise their valuable contributions to Australian and global society.





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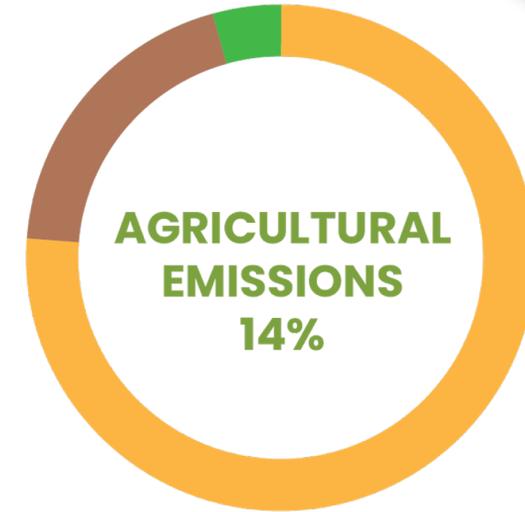
4 Next Steps

## Objectives

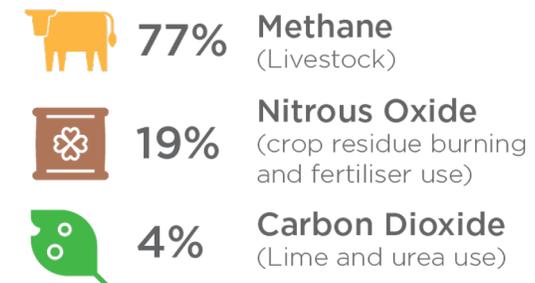
- Share with you this opportunity
- Respond to any questions or concerns
- Understand your interest in participating
- Understand next steps

## The time to tackle this is now...

- Agriculture is a significant emitter - contributing 14% of Australia's national emissions
- Agriculture is a national growth sector – pursuing \$100B value by 2030 (\$90B 2022-23)
- There is increasing ZNE policy and investment alignment
- There are lots of R&D activities underway but:
  - they are not connected or coordinated, so
  - they will not maximise their potential or industry value



▶ Agriculture contributes 14% of Australia's national emissions.





## Backed up by announcements since the bid commenced...

- Aug 4 : Climate Change Bill 2022 passed – emissions target of 43% from 2005 levels by 2030, net zero emissions by 2050
- Oct 25 : PM Albanese confirmation that Australia will join the US global pledge to cut methane emissions by 30% by 2030
  - How? Spending \$3B from the national reconstruction fund

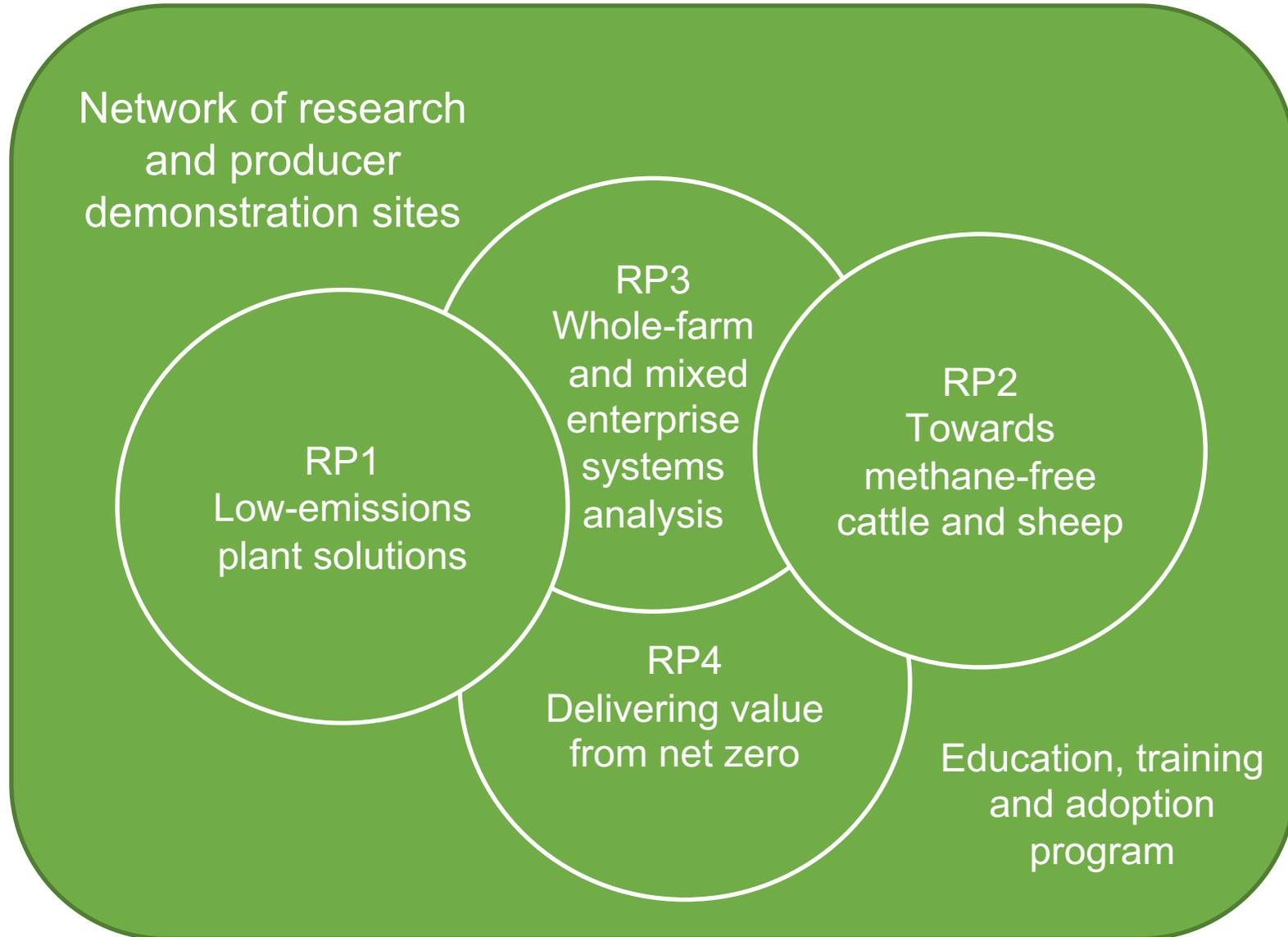


## Industry workshops April 2022, October 2022 & May 2023

- Representatives from Pastoral Companies, Supermarkets, Fertiliser Companies, Grower and Producer Groups, Banks, Plant breeding companies, Horticulture, RDCs, State and Federal Governments
- *Ag Enterprises have a strong desire to achieve net zero by 2050, but the pathways are unclear, risky and not apparent what impact on profit will be*
- Need to scale technologies (eg from 10 cows to 100,000 cows)
- How do technologies work together?
- To be adopted, new technologies need to both reduce emissions and improve profit



# ZNE-Ag CRC overview





## Producer Demonstration site network

- For scaling up, de-risking, demonstrating and stacking technology to assess impact on emissions and farm business
- 25 sites around Australia, representing major agro-ecological zones and farming practices
- Measure emissions at a farm systems level (eg methane, flux towers)
- Foundation of the CRC



## Plan on a page

PROGRAM 1: Low-emissions plant solutions	PROGRAM 2: Towards methane-free cattle and sheep	PROGRAM 3: Whole-farm and mixed-enterprise systems analysis	PROGRAM 4: Delivering Value from Net Zero
<ol style="list-style-type: none"> <li>1. Genetic solutions</li> <li>2. Plant nutrition solutions</li> <li>3. Legumes</li> <li>4. In-setting emissions in plant-based and mixed-farming production systems</li> </ol>	<ol style="list-style-type: none"> <li>1. Novel individual animal methane measurement and proxies</li> <li>2. Selection for low-emission livestock</li> <li>3. Rumen manipulation for low emissions</li> <li>4. Delivery of low emissions innovation from lab to landscape</li> </ol>	<ol style="list-style-type: none"> <li>1. Enabling on farm mitigation by developing protocols, metric and benchmarking tools for monitoring of GHG sources and sinks</li> <li>2. Integrated systems-level studies on-farm and landscapes analysis</li> <li>3. Synergies and tradeoff with other emerging ESG priorities</li> </ol>	<ol style="list-style-type: none"> <li>1. Barriers, drivers, policy and consumers</li> <li>2. Circular economy solutions</li> <li>3. Renewable energy solutions</li> <li>4. Improved supply chain traceability</li> </ol>
PROGRAM 5: Education, Training and Adoption			
<ol style="list-style-type: none"> <li>1. Research capability development for ZNE Agriculture</li> </ol>	<ol style="list-style-type: none"> <li>2. Industry capability development for ZNE Agriculture</li> </ol>	<ol style="list-style-type: none"> <li>3. Integrated demonstration sites</li> </ol>	<ol style="list-style-type: none"> <li>4. Next-generation teacher professional development and community outreach</li> </ol>



**\$87m**

Partner CASH

**56**

Industry and end-user  
partners

**\$301m**

10 year enterprise VALUE

**\$126m**

Partner IN-KIND

**\$87m**

Commonwealth  
funding REQUEST

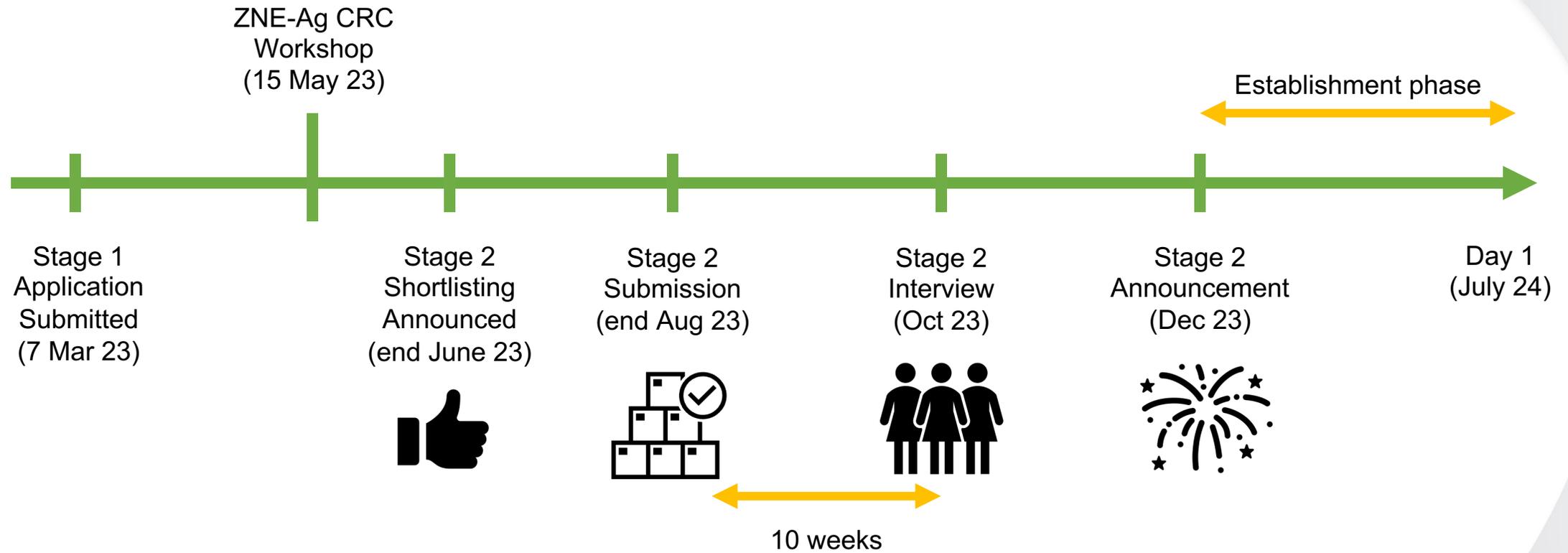
**6**

State and  
Territory Gov'ts

**10**

Universities

# The timeline





# Industry & End User Partners

