



New Zealand Investment landscape

Dr Rick Pridmore

PGGRC Chairman, NZAGRC Steering group member

**WORKING
TOGETHER**



What's driving investment?

- Good global citizen
- National commitment to reduce emissions
- Building capability
- Part of being a sustainable business
- Consumer and market demand
- Brand (industry and national)

Who's investing?



Ministry for Primary Industries
Manatū Ahu Matua



DairyNZ



NEW ZEALAND
AGRICULTURAL GREENHOUSE GAS
Research Centre



What are they trying to do?



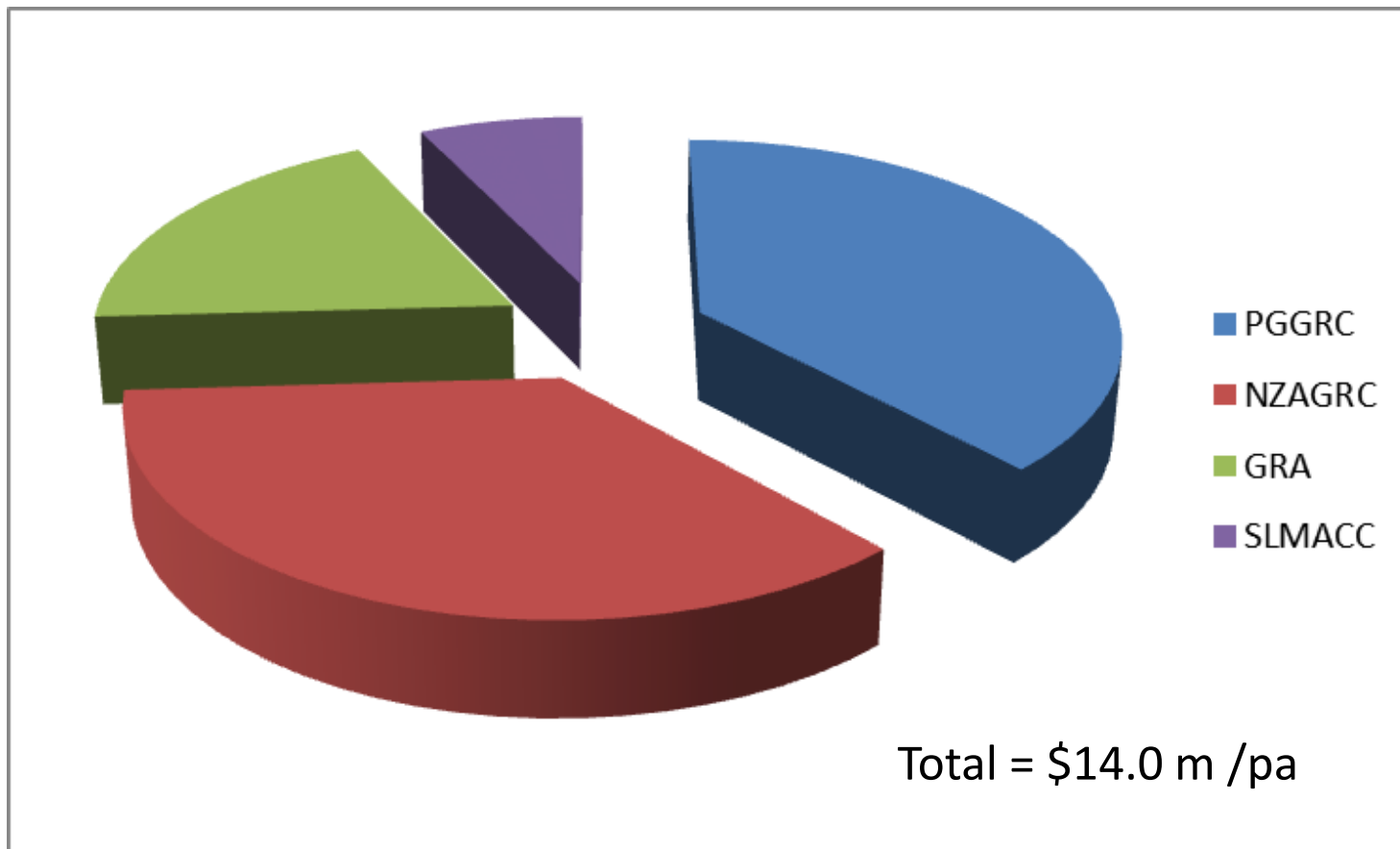
- Creating a fundamental knowledge base
 - Developing new technologies
 - Breeding better animals and plants
 - Modifying farm systems and conducting trials
 - Driving on-farm change
 - Building capability and capacity
 - Developing a robust national inventory
 - Commercialising products
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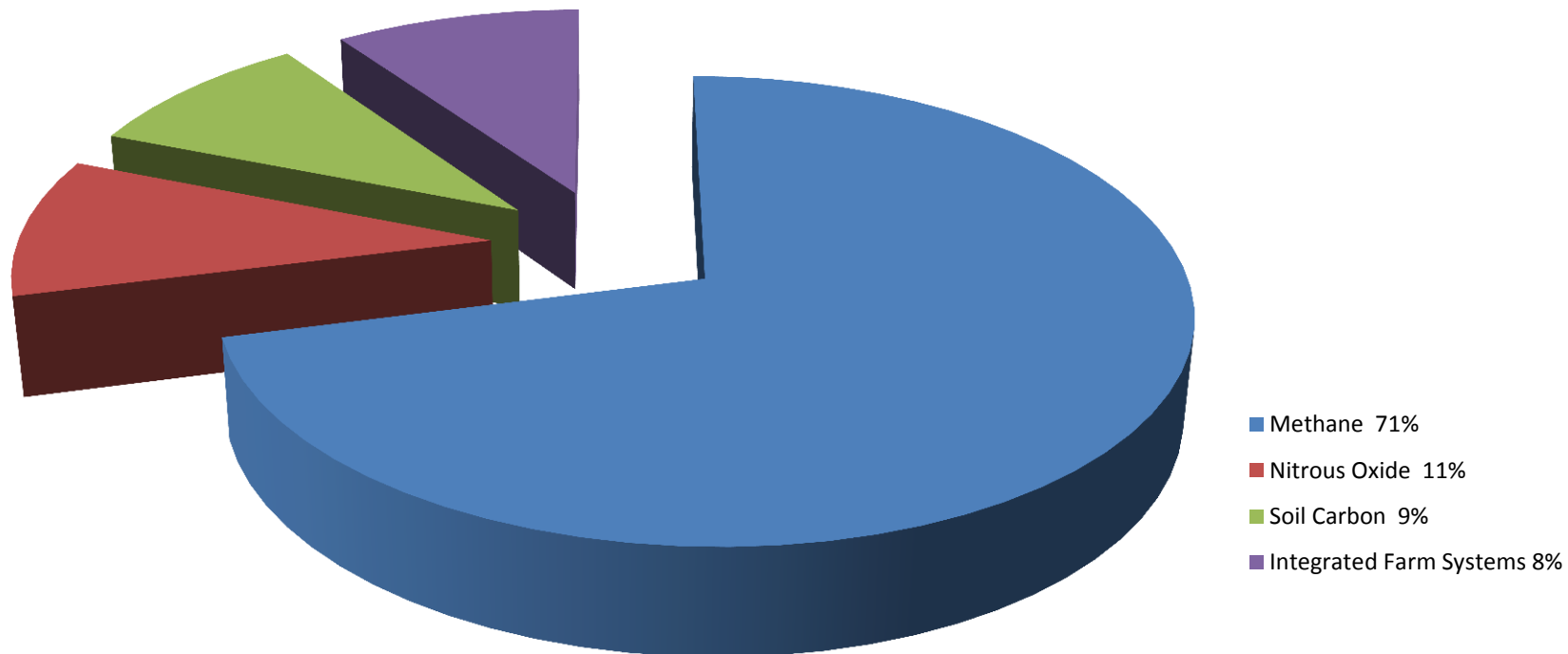
Is there a unifying plan to guide investment and optimise progress?

- Unfortunately no
 - But there is some degree of coordination
 - Enter NZAGRC and PGGRC (and the overarching presence of the Ministry of Primary Industries)
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Their investment



Their focus



Their purpose



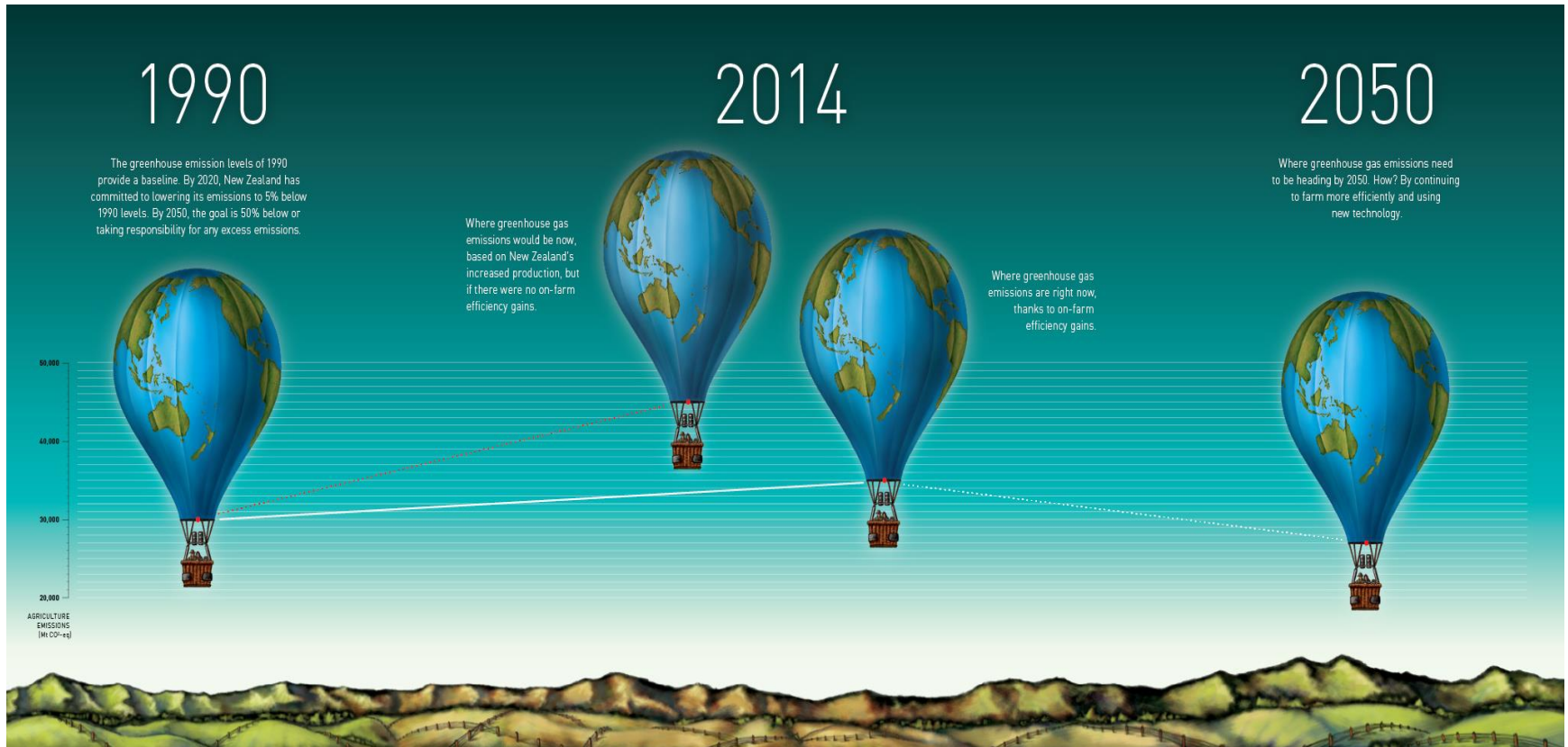
To be an internationally renowned centre for research and development into agricultural greenhouse gas mitigation solutions



To develop GHG-reducing technologies and practices for our shareholders' stakeholders, who are, primarily New Zealand farmers.



Our goal is to reduce agricultural emission intensity by 2.5% per annum from 2020



How?

- 1% through increased efficiency (continuing historical trend, relying on industry drivers)
 - 1.5 % through additional direct mitigation options
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Animal selection

- Have confirmed that there is a genetic basis that can be exploited in sheep and likely in other ruminants
 - Established a flock of high and low methane emitting sheep (heritability 0.13)
 - Intend to deliver opportunity to sheep industry in 2016/17
 - Work on cattle will commence in 2015
 - And no we haven't forgot about deer!
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Low GHG feeds

- Some brassica crops have shown potential (25-30% lower methane emission when fed 100% diet of rape)
 - Supplements (maize silage, PKE) have not altered methane emissions, but can reduce nitrous oxide emission through lower nitrogen content of feed
 - Focus is to package this information and get it included in the national Inventory
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Vaccine

- Utilises the animals own immune response to inhibit methanogens
 - Ruminants create antibodies to methanogens
 - Found antibodies that inhibit pure cultures
 - Plan to deliver antibodies to the rumen through animal's saliva
 - Animal trials with lead antigens to begin shortly
 - Aim is to engage a commercial partner once approach is proven in animal trials
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Methanogen inhibitors

- Target essential enzymes with small animal safe compounds
 - Looking for reduction of 20% or greater
 - Have screened >100,000 compounds
 - In the last four months, have confirmed 5 leads that have reduced methane by 30 - 90% in animal trials
 - Many barriers to overcome (e.g., cost, mode of delivery, undesirable impacts, food safety)
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Closing remarks



- New Zealand is putting in a great effort to reduce agricultural greenhouse gas emissions
 - There are many participants and a wide range of investment
 - The science is top class and in many areas is nearing proof of concept
 - Commercialisation will require a whole new range of skills and partners
 - Ten years ago the task seemed enormous
 - We should be incredibly proud that we are almost there
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