



Mitigation options in a temperate agricultural and forestry economy

Roger Lincoln

Ministry for the Environment

New Zealand



New Zealand Climate Change Office
Te Hōkai Raukōwhiri Ahoarangi o Aotearoa



Ministry of Agriculture and Forestry
Te Manatu Ahuwhenua, Ngāherehere



Uniqueness Factors

- No agricultural production subsidies
- Outdoor grazing of ruminants all year round
- Significant hill land (50% is sloping terrain)
- 26% of land area in conservation forest
- 7.5% of land area in planted forest
- 50% of total GHG emissions from agriculture



New Zealand Climate Change Office
Te Hōkai Raukōwhiri Aotearoa ki Aotearoa



Ministry of Agriculture and Forestry
Te Manatu Ahuwhenua, Ngāherehere



New Zealand Climate Change Office
Te Hōkaka Raukōwhiriwhiri Aotearoa o Aotearoa



Ministry of Agriculture and Forestry
Te Manatu Ahuwhenua, Ngāherehere





New Zealand Climate Change Office
Te Hōkaka Kaitiaki Take Kōwhiri o Aotearoa

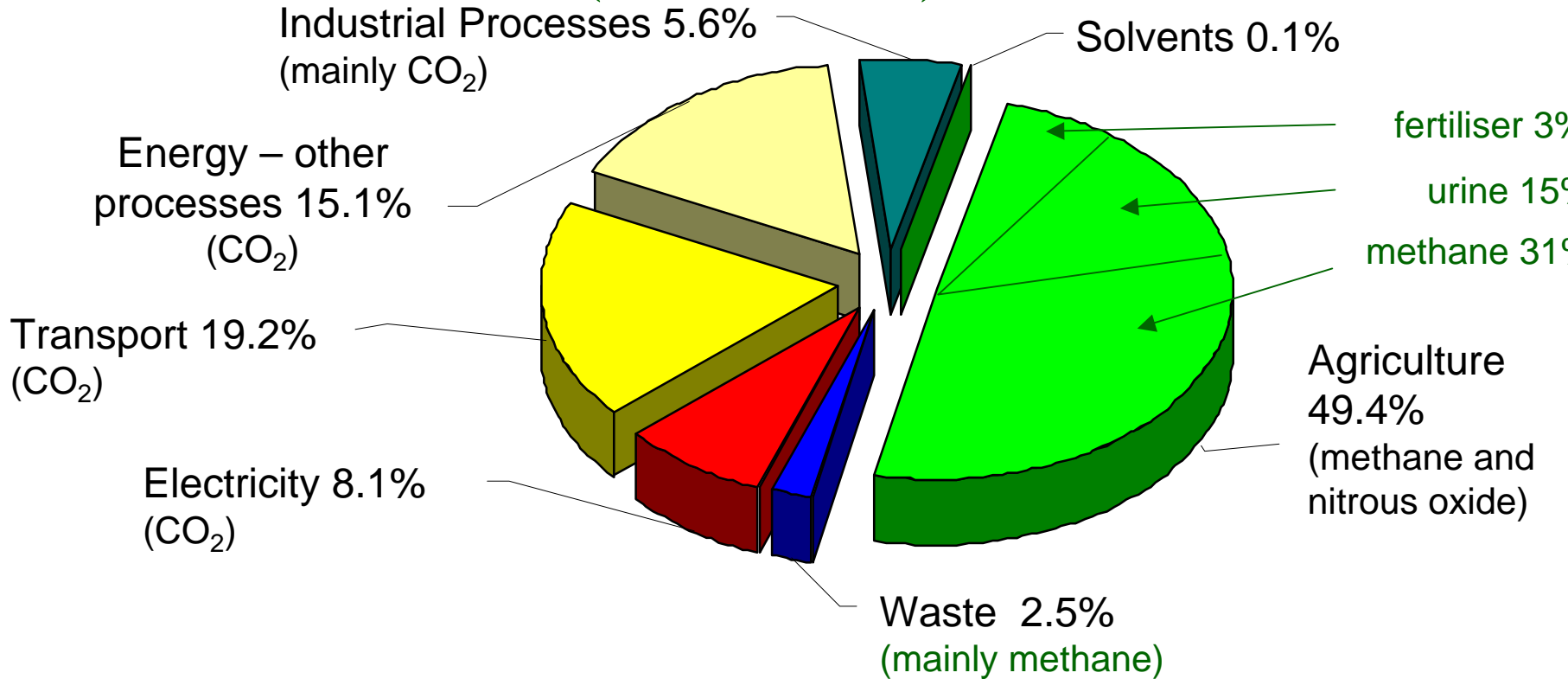


Ministry of Agriculture and Forestry
Te Manatu Ahuwhenua, Ngāherehere



NZ GHG Emissions in 2004 - By Sector

(% of MtCO₂e)





Pastoral Greenhouse Gas Research Consortium Strategy

- **Established in 2002**
- **Purpose to develop GHG mitigation solutions**
- **Solutions must be:**
 - **Practical and safe**
 - **and produce sustainable results that are accepted by the international regulatory authorities and our customers**



Mitigation research approach

Split into three areas

- methane
- nitrous oxide
- GHG measurement, improved national inventories and process/systems modeling

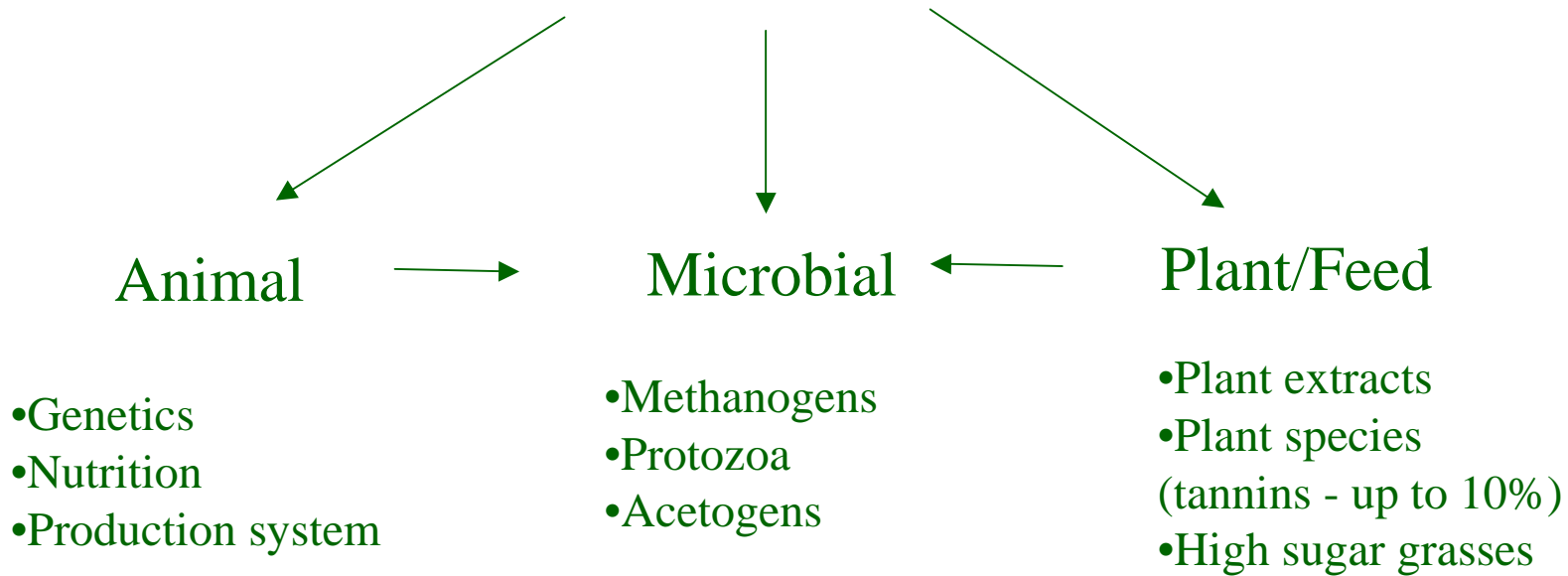
Projects separated into:

- Discovery
- Proof of concept
- Development/on farm testing
- Technology transfer/commercialisation



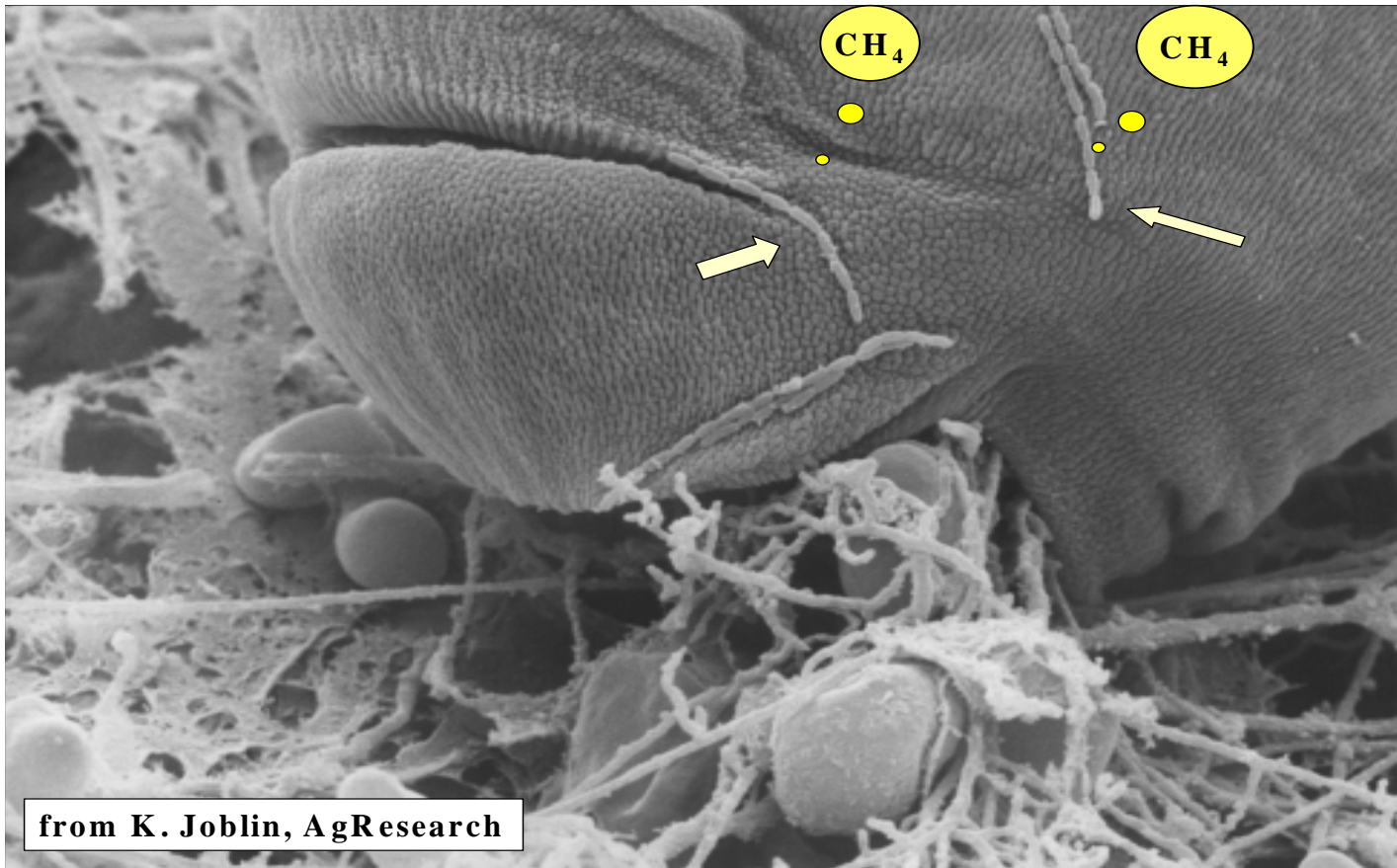


Mitigation of ruminant methane emissions





Methanogen



from K. Joblin, AgResearch

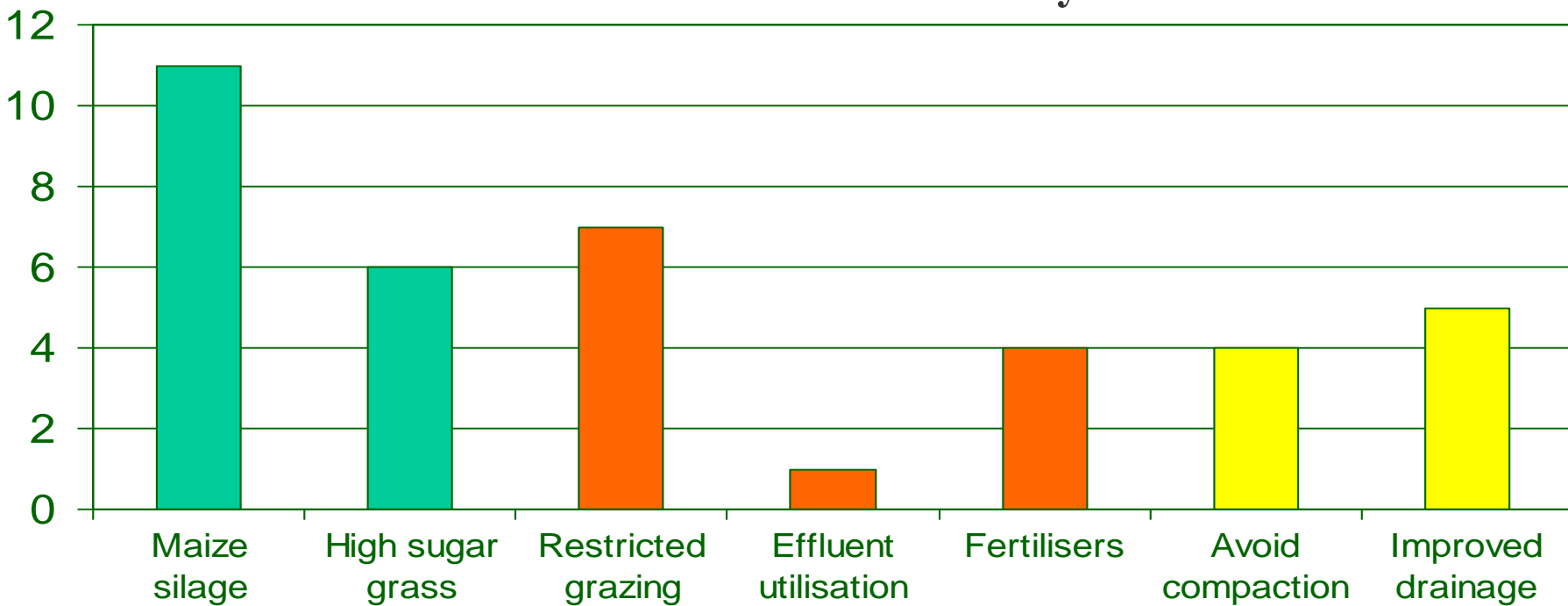


Nitrous oxide mitigation options - Reduction potential by 2010 (%)

Reduce excreta N

Increase N efficiency

Avoid anaerobic





Forest Sinks

- Some examples
 - Regional Planting Policy for Hill Erosion Control
 - Permanent Forest Sinks Mechanism



East Coast Forestry Project

- Aim to afforest 65,000 ha of worst erosion prone hill country - 32,000 ha to date
- Use of competitive tender model
- Planted forest, space planting of poplar and willows and retirement of land into indigenous vegetation.



Hill Erosion Control - Before





Hill Erosion Control - After





Permanent Forest Sinks Initiative

- **Voluntary** scheme
- Landowners opt to establish new permanent forests to gain tradable **Kyoto emission units**
- **Rights and obligations** formalised in contracts between landowners/Crown
- Contracts registered on **land titles** and bind future landowners (*legislation under development*)
- **Limited harvesting** (continuous canopy)



Conclusions

- **At present, practical mitigation options for grazing ruminants and grazed pastures are limited.**
- **More research is required, however, this is of low priority in most developed countries.**
- **Economic opportunity will be the key driver.**
- **Co-benefits from actions to reduce emissions can be substantial e.g. more efficient production, water quality, biodiversity, flood protection, bioenergy.**



Further collaboration

- For more information please contact the Ministry of Agriculture and Forestry
hayden.montgomery@maf.govt.nz
- We welcome discussions with any party to share experiences and discuss approaches to deal with agricultural emissions



Thank you!



New Zealand-farmed red deer being measured for methane emissions