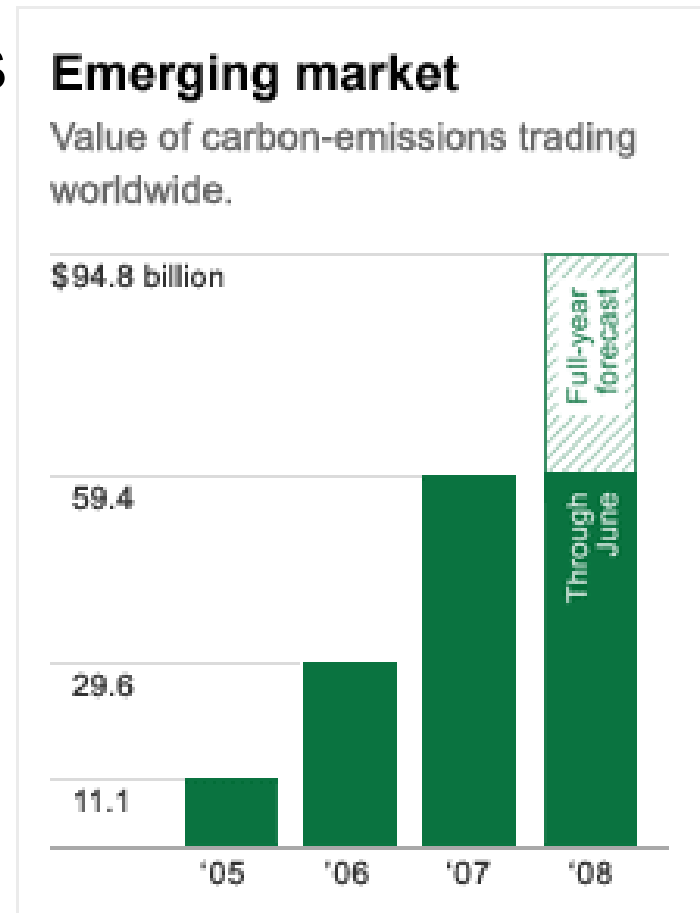


**Climate change, food security and
soil carbon: unlocking carbon
finance to help fund a transition to
sustainable agriculture**

David Eyre,
Policy Manager
NSW Farmers' Association

Carbon finance

- The global carbon market was worth around \$118 billion in 2008, rising **84** percent from 2007 (Reuters Jan 2009)
- Projected \$150 billion in 2009
- US market estimated at \$1 trillion annually by 2020. (Fortune Magazine, April 2008)



SOURCE: POINT CARBON
FORTUNE GRAPHIC

Abatement potential in agriculture

“There is significant technical potential to reduce global agricultural emissions and to increase sequestration in agricultural lands, estimated at 5.5 - 6 Gt of CO₂e per year by 2030.”

- 89% through soil carbon sequestration
- 9% through improvements in rice management and livestock/manure management (CH₄)
- 2% through cropland management (N₂O)”

Food and Agriculture Organisation of The United Nations, 2008

Agronomic challenge

- Current farming systems will need to be altered
- The rate of natural increase in soil carbon reserves is generally slow
- Exogenous carbon – eg biochar – may be critical to success
 - But many questions to answer regarding feedstock, soil chemistry, application methods and so on.
- Nutrients will be tied up along with carbon in stable forms of soil organic matter such as humus

Nutrients worth more than carbon credits?

Nutrients are required to store stable forms of C in soil

Amount of nutrients tied up every tonne of soil carbon (= 1.7 t humus)

= 80 kg N (value if replaced with fertiliser @ \$1.50/kg N = \$120)

= 20 kg P (value if replaced with fertiliser @ \$5/kg P = \$100)

= 14 kg S (value if replaced with fertiliser @ \$2/kg S = \$28)

Approx total cost for as long as C stored = \$248/tC

If market price was \$40/tonne CO₂, then 1 tonne soil C (= 3.7 tonne CO₂) would be worth approx \$150

This is less than the value of the nutrients!

Policy barriers

- Current accounting and MRV rules not suitable and skewed to carbon forestry
- Conflicting objectives between environmental and farm sectors, and between nations
- Australia clause – Article 3.7

Wentworth Group

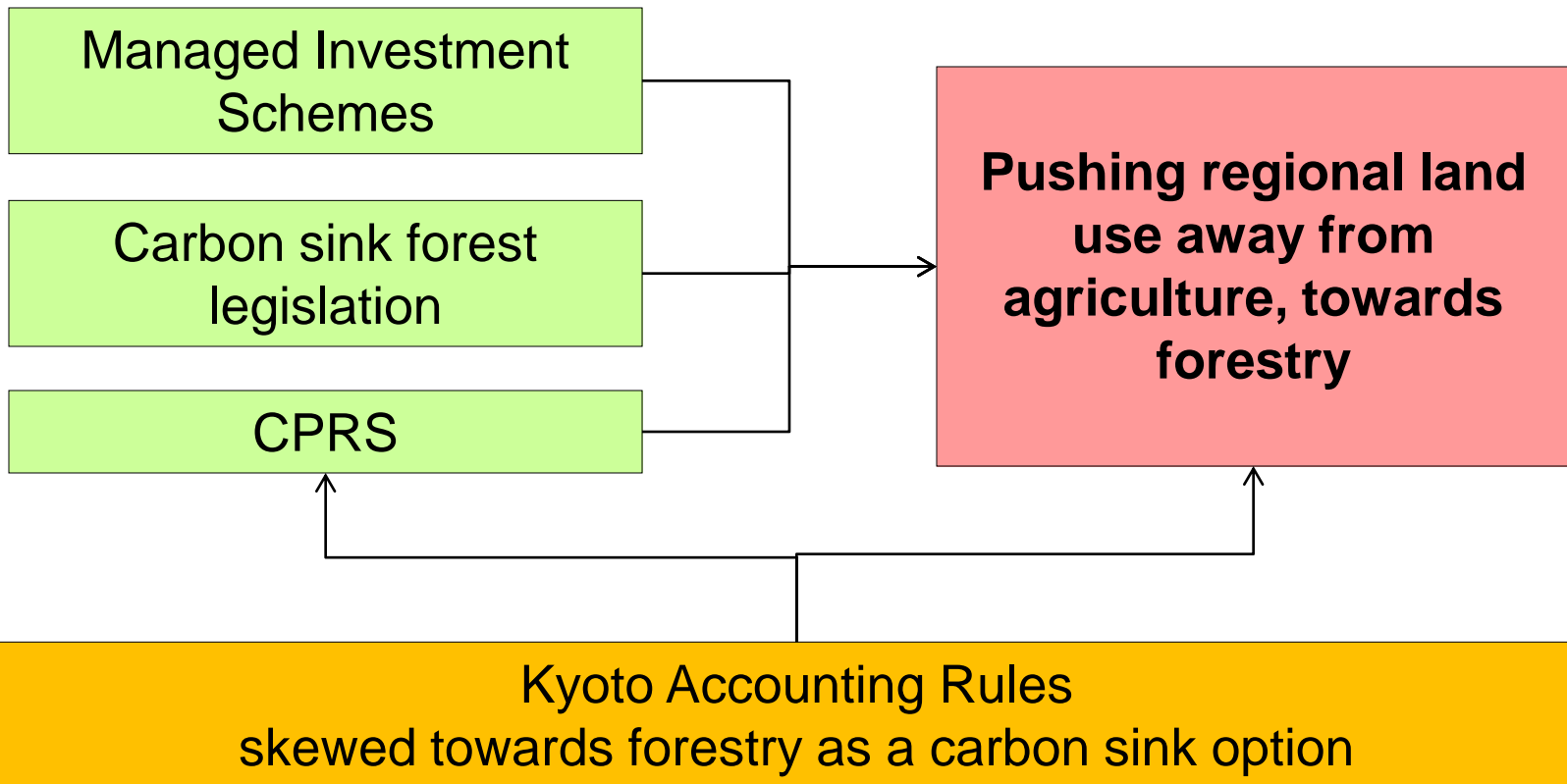
TABLE 2: BIOPHYSICAL POTENTIAL OF AUSTRALIAN LANDSCAPES TO SEQUESTER CARBON 2010 - 2050¹³

Action	Potential (Mt CO ₂ -e /yr)
Agriculture	
Grazing land management (incl. soil carbon)	100
Livestock emissions (mainly methane)	26
Crop land management (incl. CO ₂ and N ₂ O emissions)	25
Savannah Fire Management	13
<i>Sub-total Agriculture</i>	<i>164</i>
Forestry	
Carbon forestry (biodiversity plantings - 350; plantations - 400)	750
Land clearing and regrowth	56
Eucalypt forest management	47
<i>Sub-total Forestry</i>	<i>853</i>
Bioenergy¹⁴	
Biofuels	not avail
Biochar	not avail
Total	1,017
Australia's total net annual greenhouse gas emissions (2007)	597

Primary Source: An Analysis of Greenhouse Gas Mitigation and Carbon Biosequestration Opportunities from Rural Land Use, CSIRO (2009)

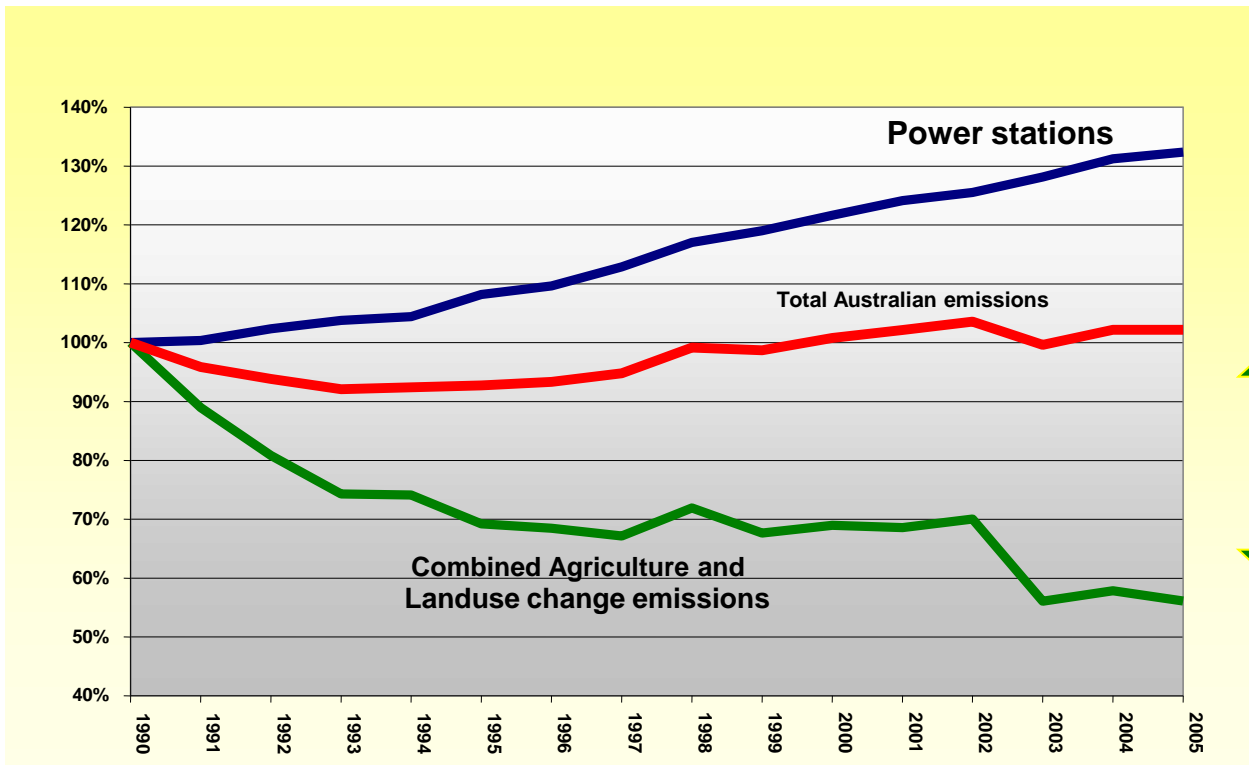
Managed Investment Schemes

- incentives for forestry offsets



Land clearing bans offset emission increases from coal

Emissions from stationary energy increased by 49.5 per cent between 1990 and 2007 (Source: AGO 2008)

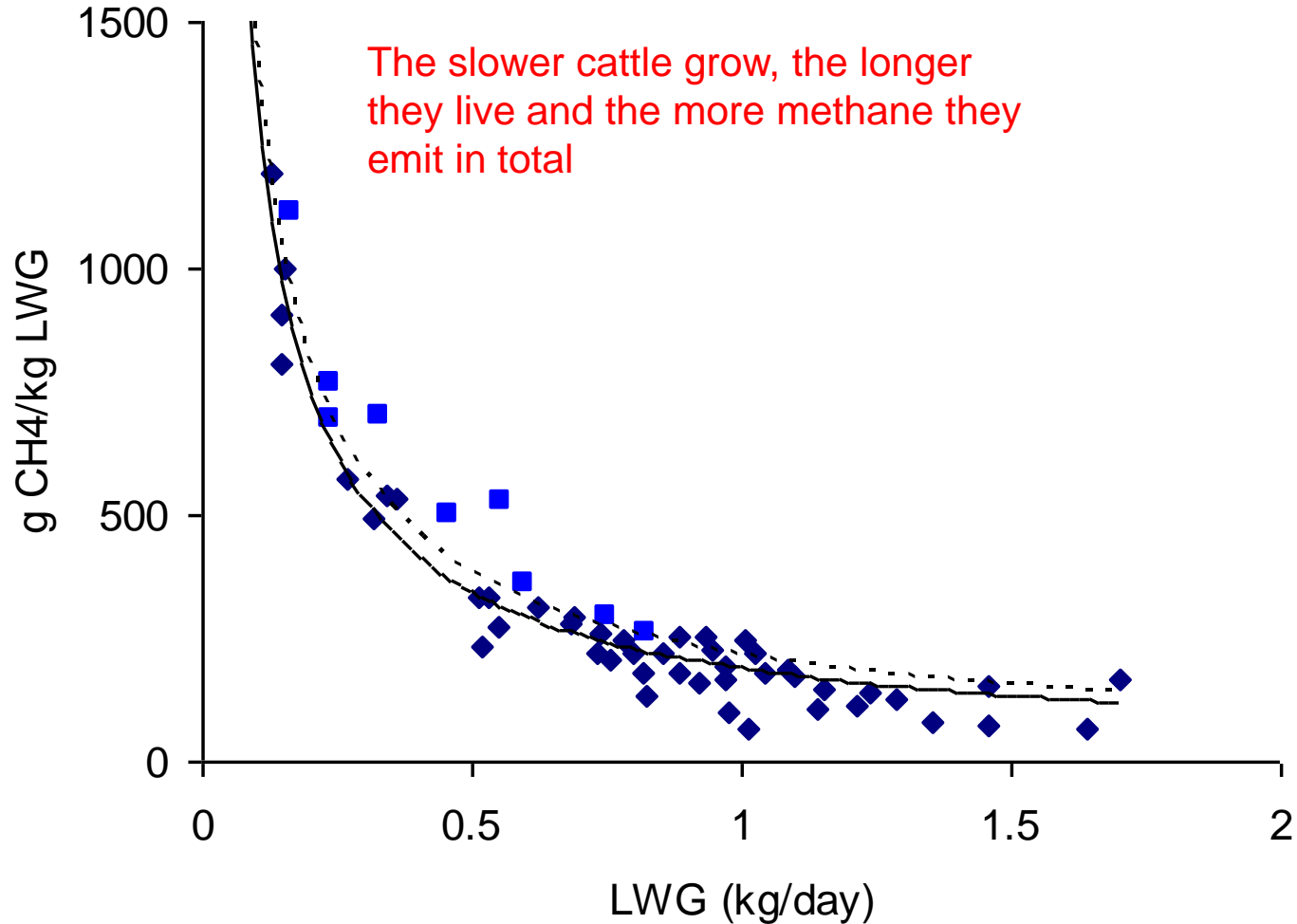


The coal and energy sector has not paid farmers for this service – no carbon credits were exchanged

Farm sector concerns

- Marginal cost
 - Feasibility and costs will vary between farmers, regions, commodity type, soil type and rainfall profile etc
- Other factors:
 - The legal responsibilities and obligations for farmers by electing to engage
 - Risk of non-compliance
 - The offset framework/structure (e.g.: permanence and additionality requirements)
 - The revenue potential of alternative land use options
 - Threat of indirect policy approaches “complementary measures”
 - Structural impacts

Beef Cattle Methane/kg Live Weight Gain



Howden and Reyenga (1999)

Policy challenge

- “Connecting the dots” between soil condition, climate change, food security, water security, Aid and carbon finance
- An international sectoral agreement on sustainable agriculture?