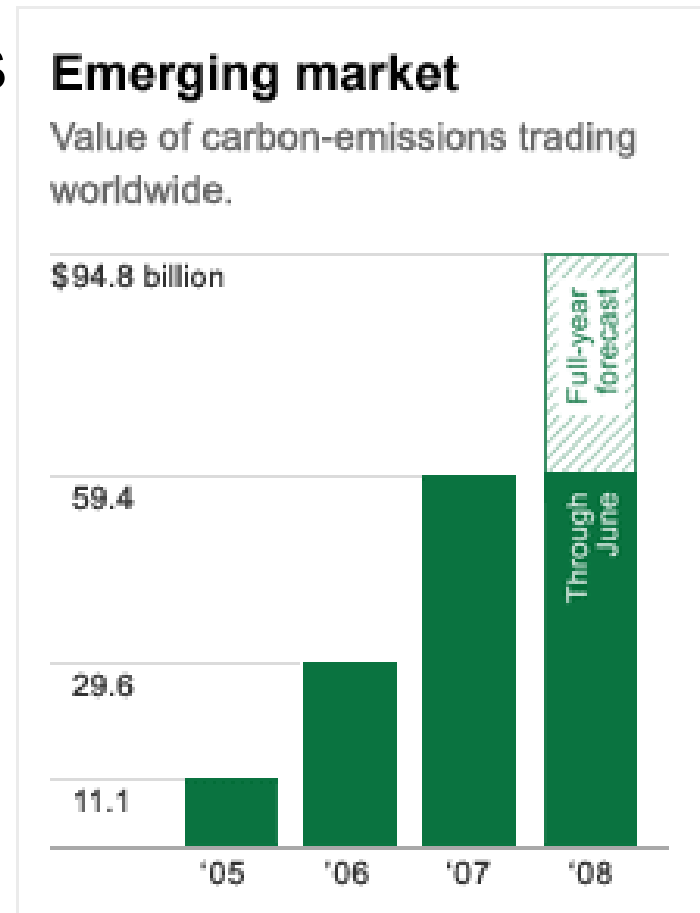


**Climate change, food security and  
soil carbon: unlocking carbon  
finance to help fund a transition to  
sustainable agriculture**

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 CO<sub>2</sub>e per year by 2030.”*

- 89% through soil carbon sequestration
- 9% through improvements in rice management and livestock/manure management (CH<sub>4</sub>)
- 2% through cropland management (N<sub>2</sub>O)”

*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 CO<sub>2</sub>, then 1 tonne soil C (= 3.7 tonne CO<sub>2</sub>) 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

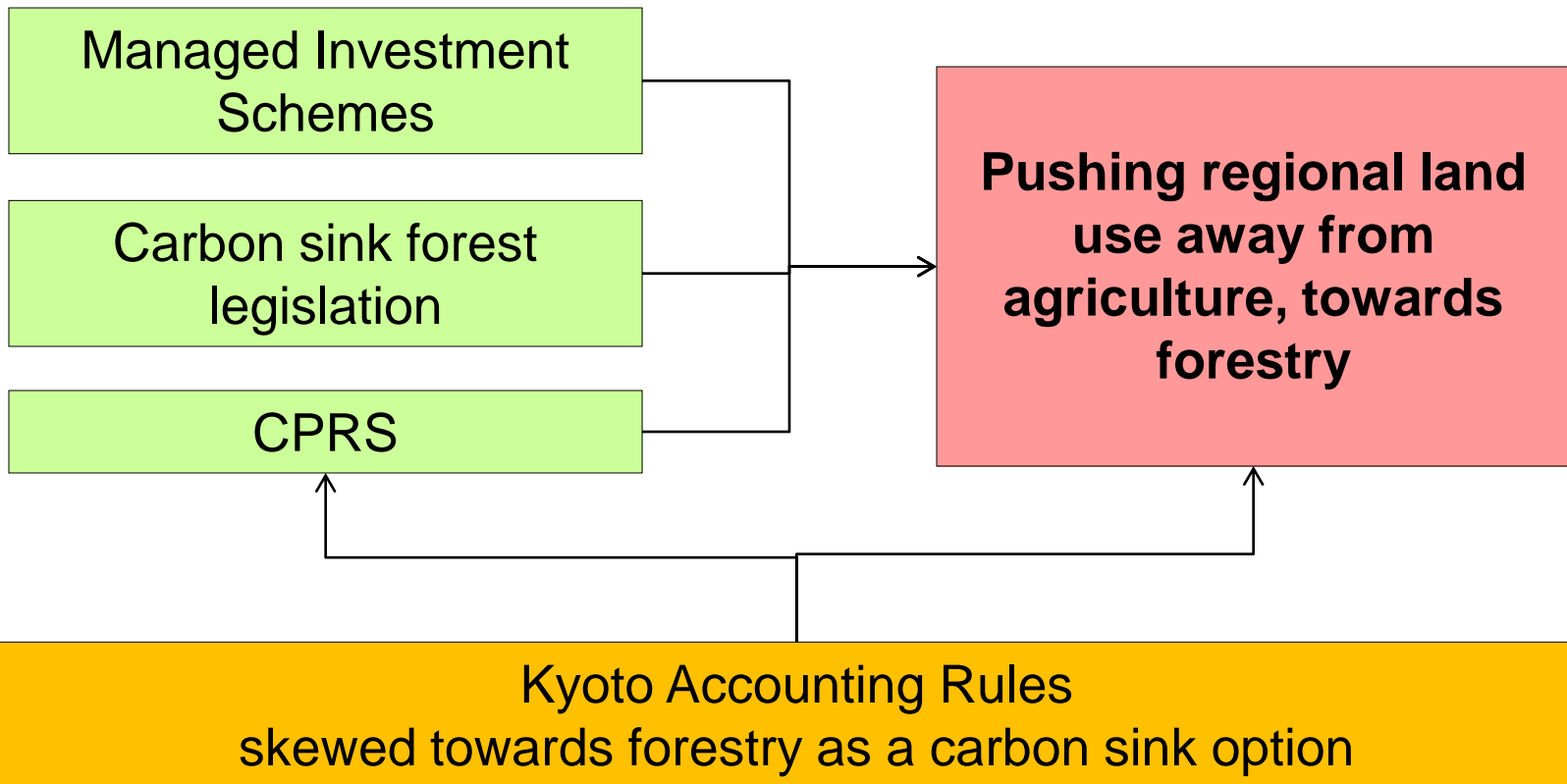
TABLE 2: BIOPHYSICAL POTENTIAL OF AUSTRALIAN LANDSCAPES TO SEQUESTER CARBON 2010 - 2050<sup>13</sup>

Action	Potential (Mt CO <sub>2</sub> -e /yr)
<b>Agriculture</b>	
Grazing land management (incl. soil carbon)	100
Livestock emissions (mainly methane)	26
Crop land management (incl. CO <sub>2</sub> and N <sub>2</sub> O emissions)	25
Savannah Fire Management	13
<i>Sub-total Agriculture</i>	<i>164</i>
<b>Forestry</b>	
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>
<b>Bioenergy<sup>14</sup></b>	
Biofuels	not avail
Biochar	not avail
<b>Total</b>	<b>1,017</b>
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)**

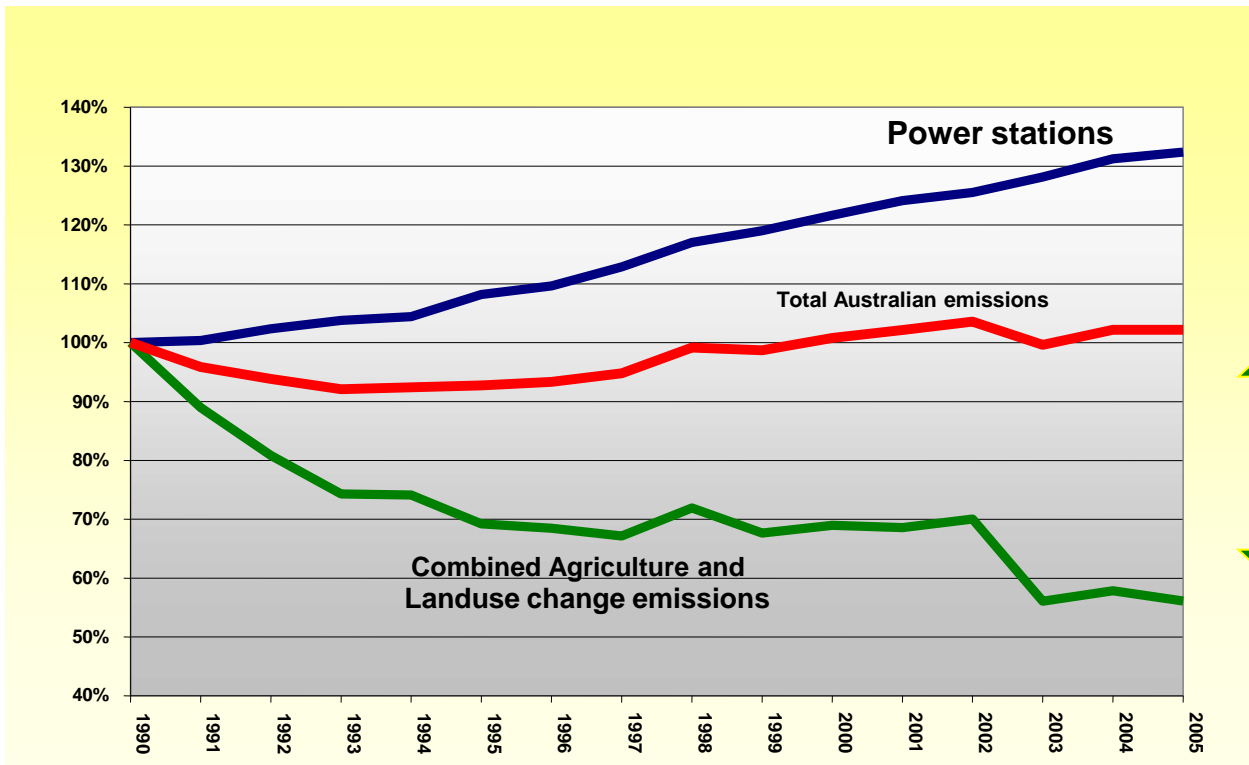
# Managed Investment Schemes

- 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)

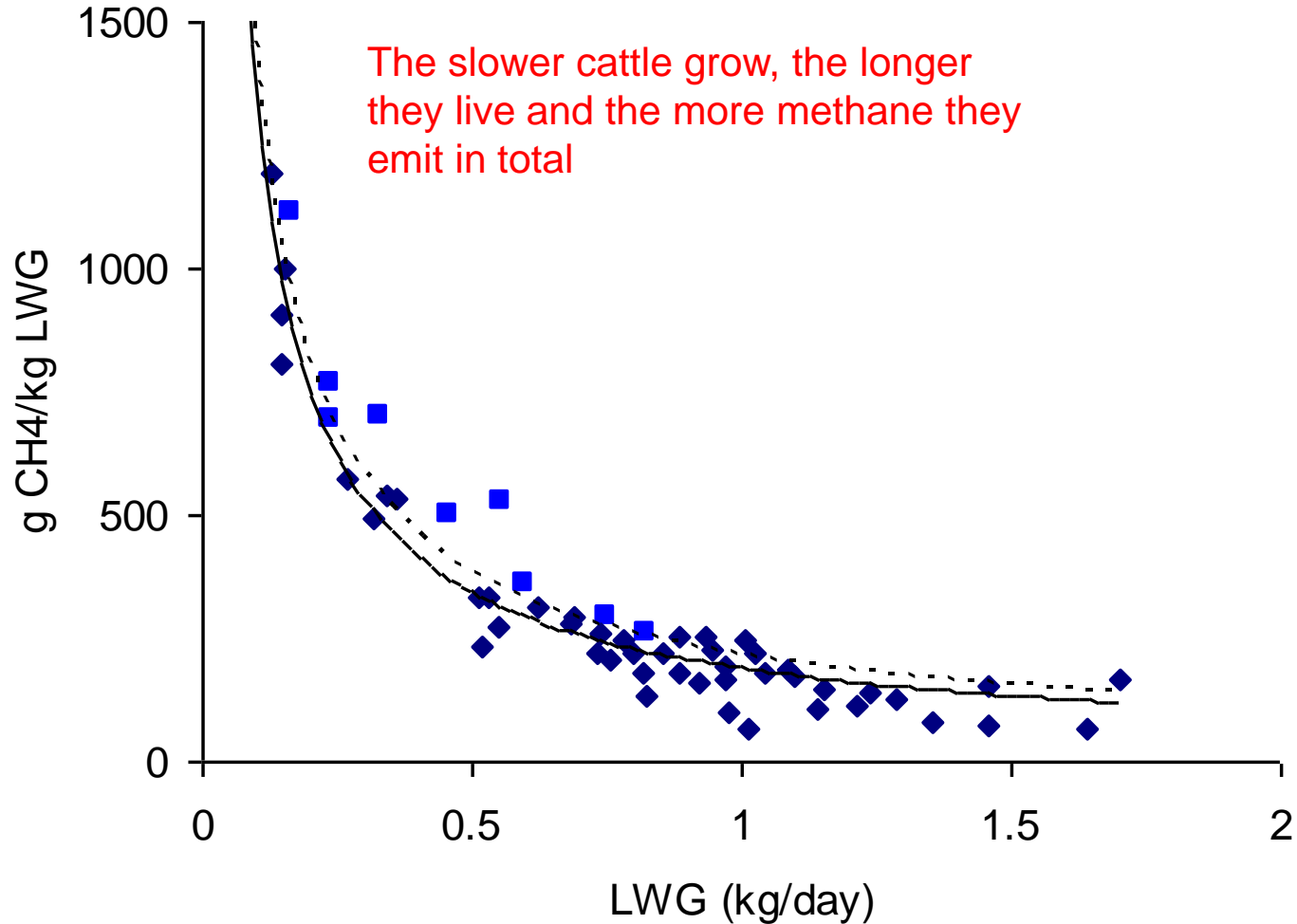


**The coal and energy sector has not paid farmers for this service – no carbon credits were exchanged**

# 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?