

# Cross-industry issues

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The Primary Industries Climate Challenges Centre is a joint venture between the University of Melbourne and the Victorian Department of Environment and Primary Industries



THE UNIVERSITY OF  
MELBOURNE



Department of  
Environment and  
Primary Industries



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**The PICCC Brief:**

**Sustainable intensification is emerging as the new paradigm for agriculture to address global food security while reducing the environmental footprint of food production.**

**Translating the theory of sustainable intensification into increased Australian farm productivity requires new and innovative research.**

**This Think Tank event will seek to identify the key innovations needed, and point the way forward for future collaborative research.**

***What are the innovations and technologies needed for the sustainable intensification of agriculture in south-east Australia?***

## **Cross Sectoral/Economy-wide**

**What are the innovations and technologies needed for the sustainable intensification of agriculture in south-east Australia?**

- (i) The 2050 Agenda: Macroeconomy/Public Administration**
  
- (ii) The 2050 Agenda: Microeconomy/Farm - Coping with Change**



# Think about the future and act as if it were already here

## 1980-2015 PAST

Look to the future as far as the eye can see....

What science has built over centuries, ignorance can destroy in a day

The future will be the result of many small decisions and a few big decisions

That's not a plan, that's an idea - and not much of an idea at that

Recognizing facts, and pointing out tendencies which those facts indicate, is not prophesying

**It is possible to have a future where the values of all but the most extreme materialists and the most extreme environmentalists can be satisfied**

## 2015-2050 FUTURE



# CHANGES that will help maximize social welfare in future (i)

## **The 2050 Agenda: Public Administration/Macroeconomy**

### **Policy Reform:**

- **Informed public policy debate: role of scientific and economic theory, BCA.**
- **Improved quality and speed of bureaucratic decision making: 25 years from good ideas to good policy**
- **Reduced impediments to socially beneficial economic activity, change and investment**



# CHANGES that will help maximize social welfare in future (ii)

## **The 2050 Agenda: Microeconomy/Farm Coping with Change**

- **Enhanced Human Capital – rigour in primary, secondary, tertiary education**
- **Whole system understanding and thinking – the world does not come to us in disciplines**
- **Re-emphasized Agricultural Research Investment –funding, evaluation, and application of rigorous science and economics, 20<sup>th</sup> and 21st century farm economics**
- **Quantity and quality of new technology and information pre farm, on farm and post farm**
- **Increased flexibility within farm and between farms**
- **Managing the risk that creates return**



# An Engineering Perspective

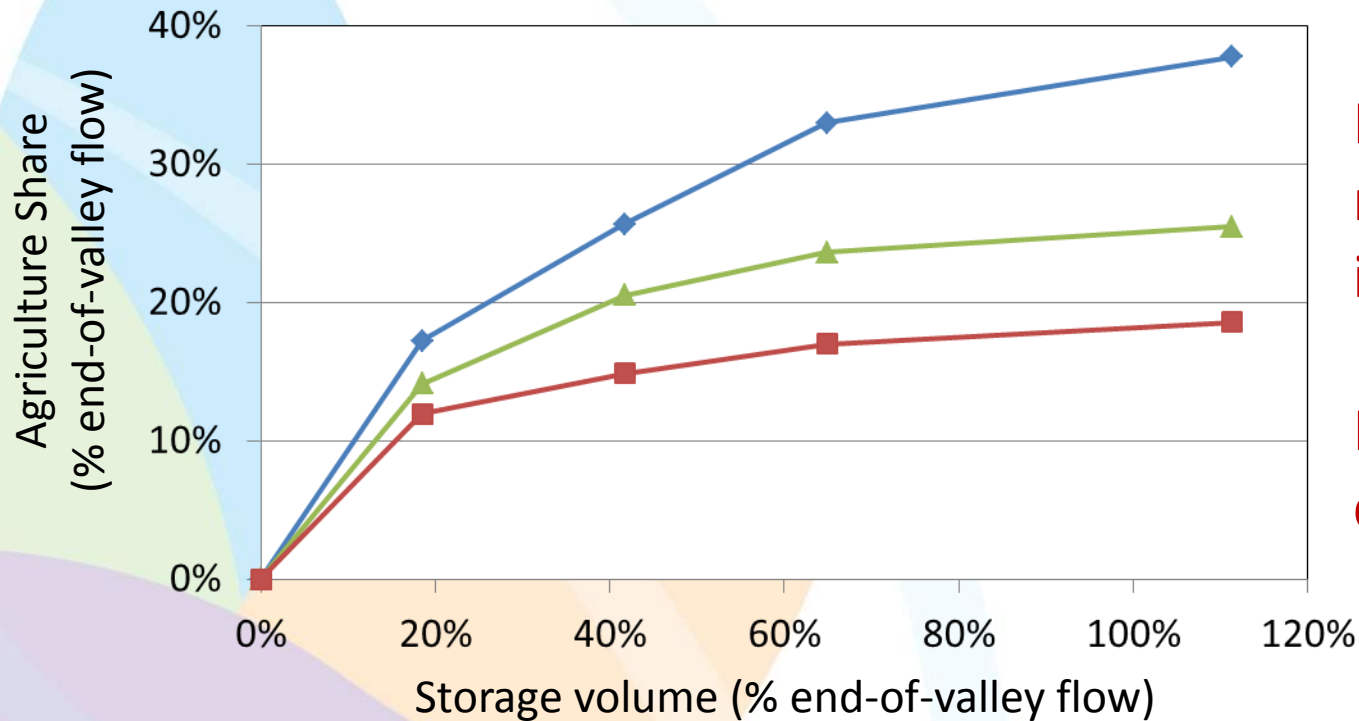
From Andrew Western, Department of Infrastructure Engineering, University of Melbourne

- Water
- Environment
- Etc



# Climate Change Impact

- ◆ Historical Climate Historical Entitlements
- ▲ High Climate Change Historic Entitlements
- High Climate Change Adjusted Entitlements



**Uncertainty!**

0-50% reduction in water availability

More heavily regulated systems impacted more

Dams end up over-designed





# Water markets will mature further

- Cross-sector trade
  - Melbourne may buy more entitlement – perhaps 200GL from Goulburn (in the long term)
  - Closure of thermal power stations frees up water
  - Some environmental purchase (but 2/3 done)
- Seasonal Trade between agriculture and environment will benefit both
  - Reducing resource volatility in agriculture
  - Increasing environmental water for high flow events



# Joint management of biodiversity – Farms Rivers Markets



Uniwater



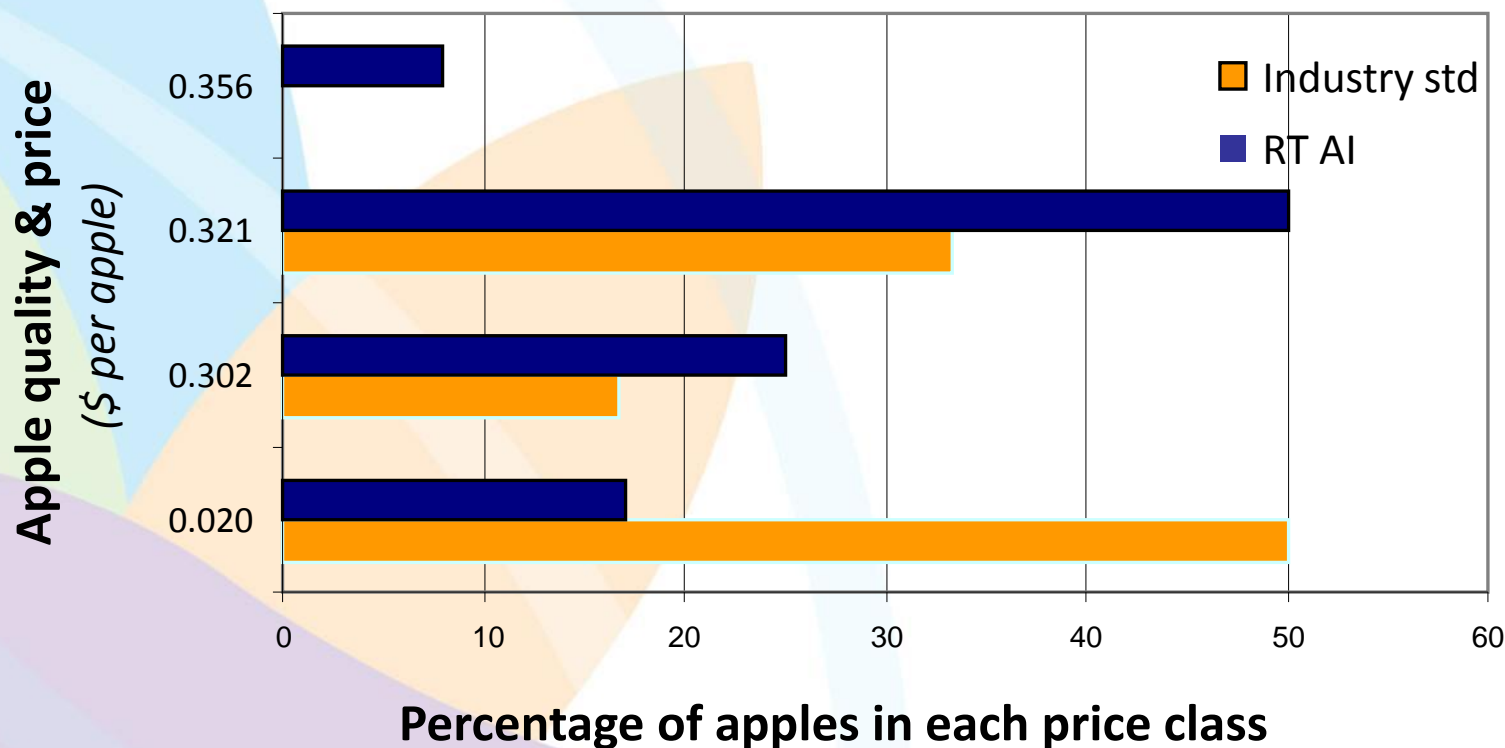




# STI Program – Horticulture Quality Outcomes

## Pink Lady apple quality and value

- standard manual industry irrigation practice
- real-time automated irrigation (RT AI)

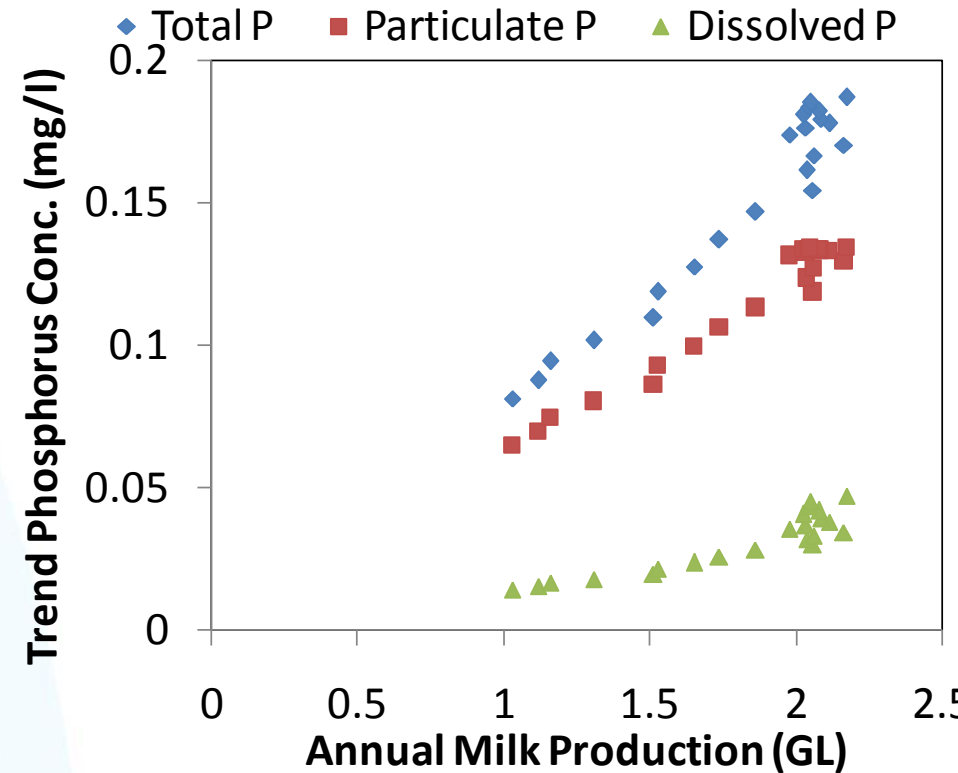
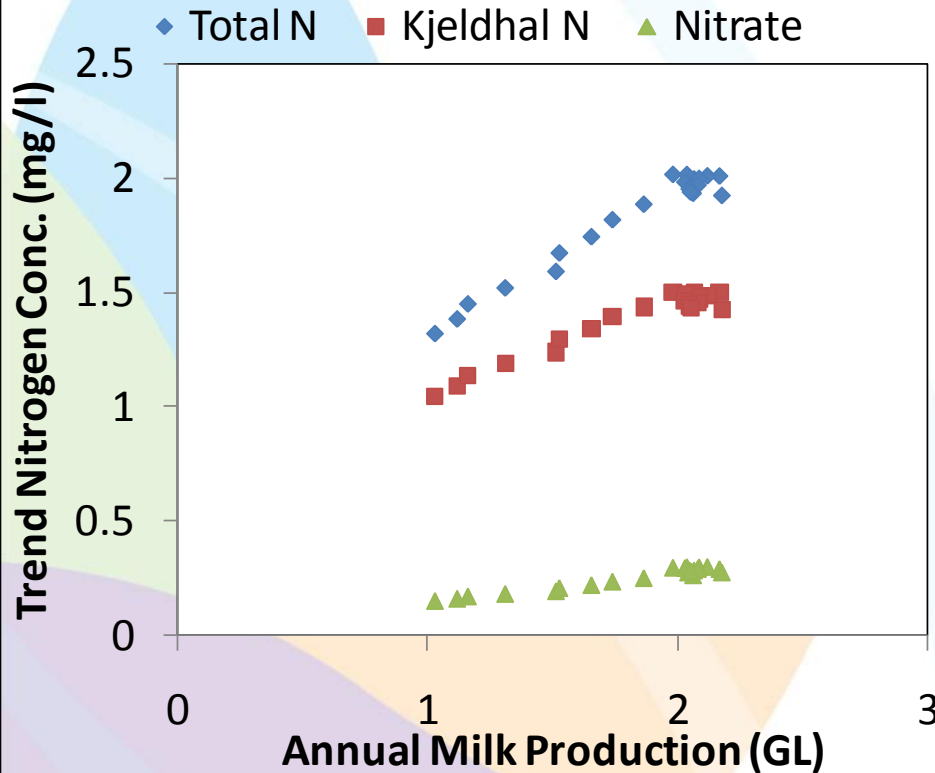




# Environmental impacts – society will be watching

Externalities – the trend is to Polluter Pays

Intensity = Impact  $\rightarrow$  Intensity  $\neq$  Impact





# Other trends

- What role in future energy
  - “Waste” to energy?
  - Fermenting cellulose?
  - As siting for joint energy production and agriculture
- What role in biodiversity
  - 8M in Melbourne wanting a rural retreat
  - Being paid to protect biodiversity



# Natural Resources and Technology

- Water management is automated leading to significant **quality** increases in Horticulture and **production** increases in Fodder
  - This will include plant oriented sensing
- High climate change **uncertainty**
  - Could be half as much water
- Water markets **expanded**
  - Competition from the Environment and Melbourne
- **Environmental Impacts** will be focussed on