



# Sustainable Bioenergy in Australia: an overview

Bioenergy Australia Conference 2011

Deborah O'Connell, Annette Cowie, Heather Brodie, John Raison, Brendan George

# ***Sustainable Biomass Production***

***And thanks to the broader team who have contributed to our thinking in this area:***

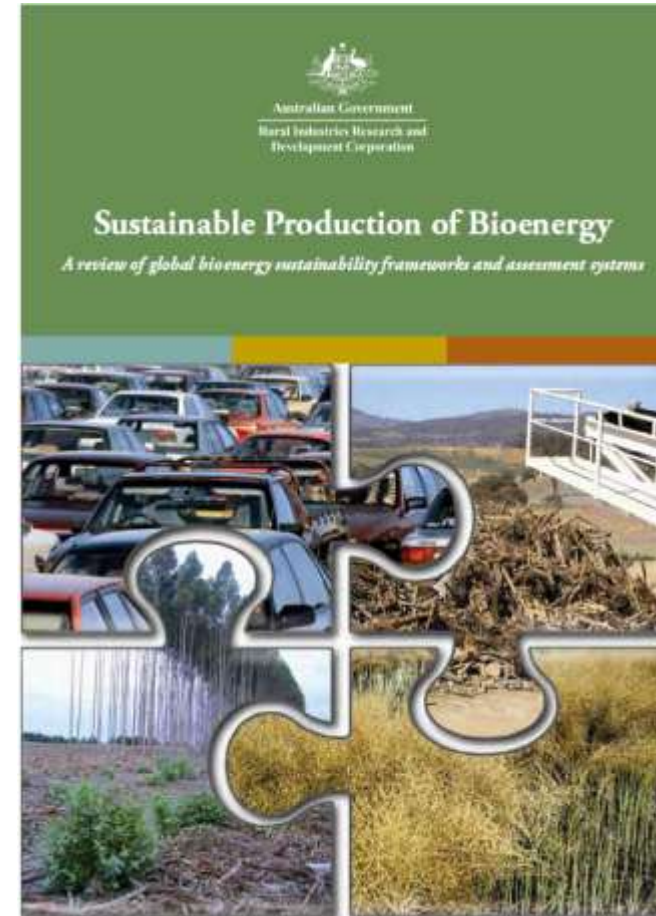
*Andrew Braid, Joely Taylor, Alexander Herr, Barrie May, Luis Rodriguez, Michael O'Connor, Tom Jovanovic, Debbie Crawford, Helen Murphy, Di Prestwidge, Mick Poole, Damien Farine, Michael Dunlop, Peter Campbell, Franzi Poldy, Kristian Handberg*

# Sustainability and bioenergy

- Sustainability credentials for bioenergy now seen as necessity by many governments, and the community
- Comprehensive review of sustainability frameworks and application 2009

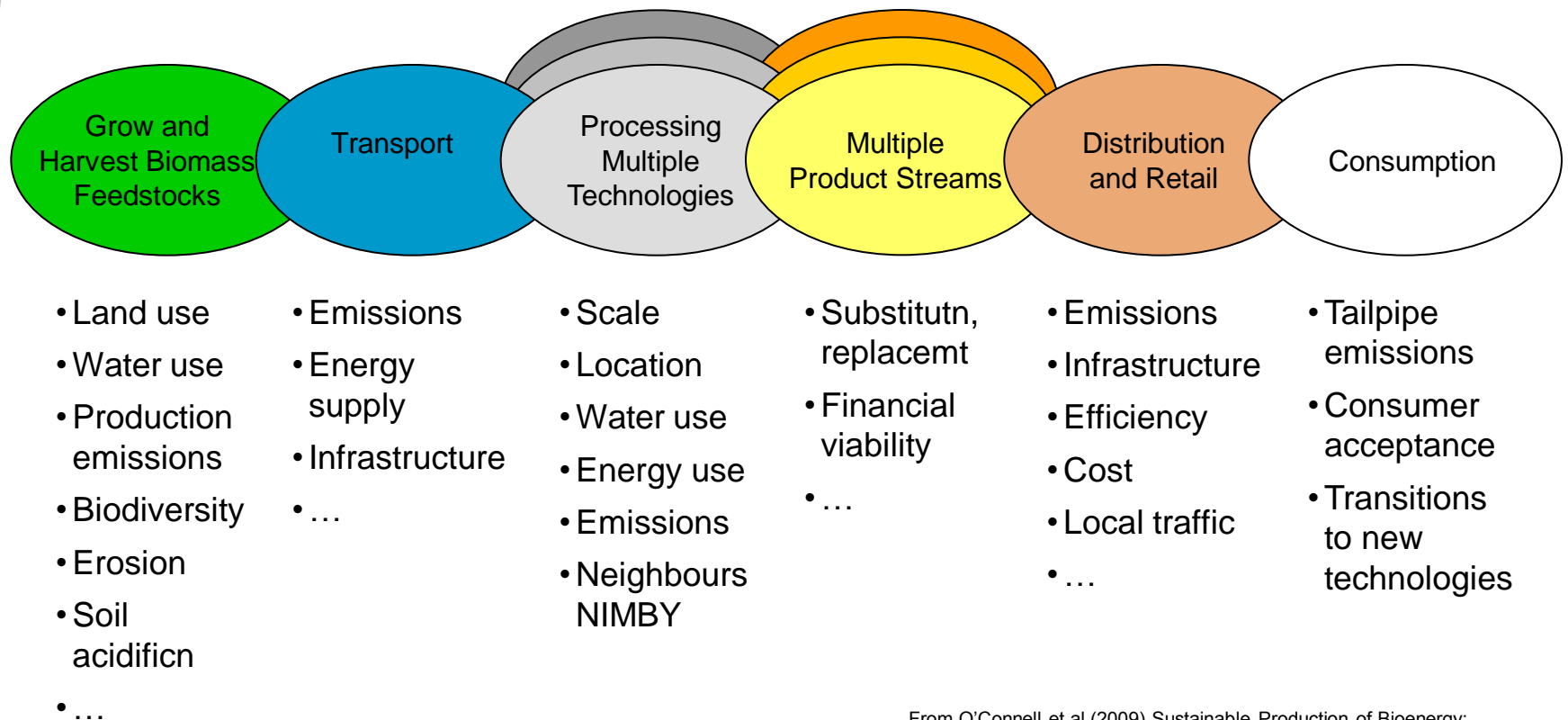
⇒ What are the issues for Australia?

⇒ Where are we at now?



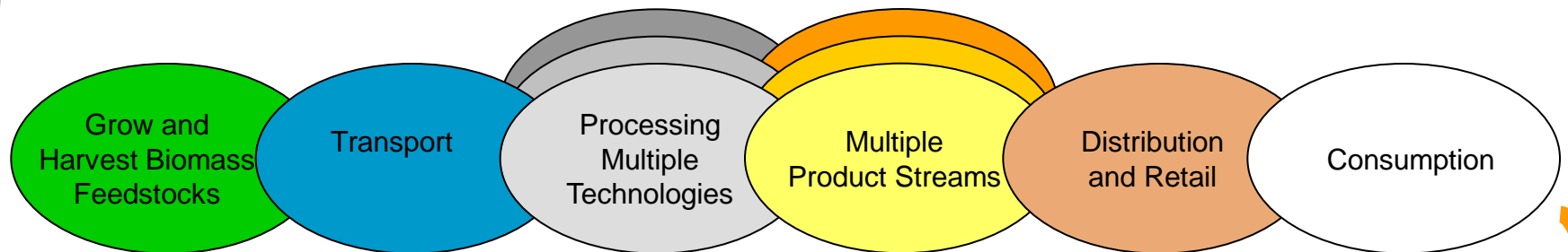
# Sustainability issues arising from bioenergy

## Direct impacts



# Sustainability issues arising from cumulative effects

- Indirect effects** - at large industry scale  
- in different market  
- distant location  
- separate jurisdiction...



Emissions from peat land higher than mineral diesel

Displace the nondiscriminant markets to the new plantations

Certify only existing plantations for biodiesel

Clear more rainforest

Increase production of palm oil in Asia

Expand biodiesel market in Europe

# Legislated principles of sustainable development...

- National Strategy on Ecologically Sustainable Development (ESD) 1992

“Using, conserving and enhancing community’s resources so that **ecological processes**, on which life depends, are maintained, and the **total quality of life**, now and in the future, can be increased”

- Legislated in Australia EPBC Act 1999

**...How do we operationalise these principles?**

# ESD and biomass

## Maintenance of ecosystem function

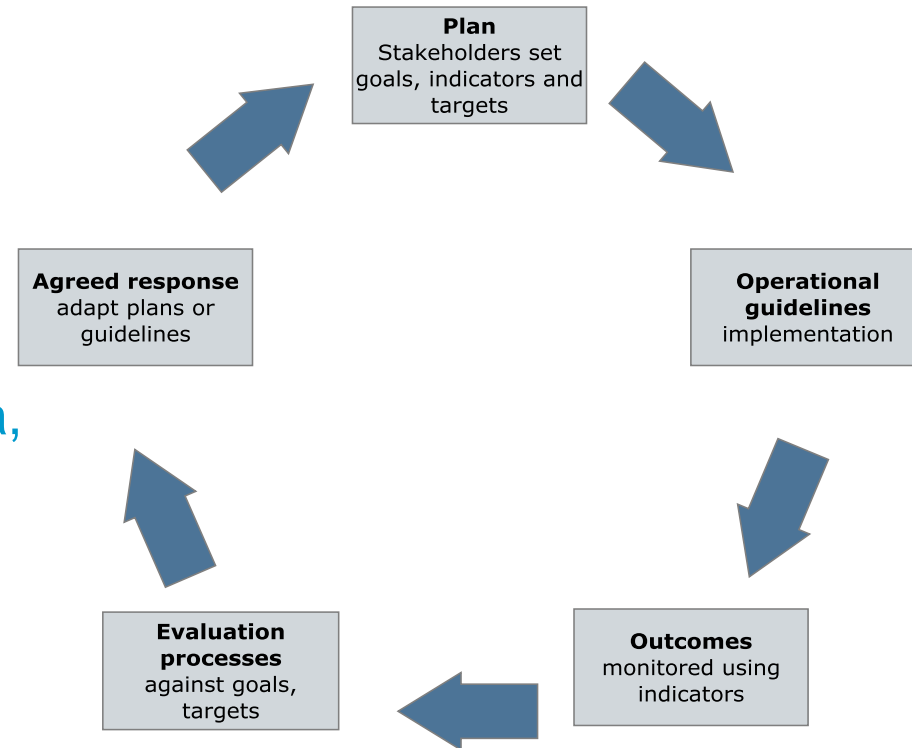
- Volume, timing of irrigation or rain, soil water storage and availability
- Nutrient and carbon cycling
- Habitat and biodiversity – providing critical ecosystem functions e.g. bacteria

Biomass growth and yield

Delivery of values	Use values (consumptive)	Non use values (non-consumptive)
Market values	Plantation wood for paper, timber, fibre Electricity, fuel, bioproducts Managed native forest	
Non market values	Traditional use for heating and cooking	Carbon sequestration Enjoyment of camping in forested land

# Sustainable forest management – strong if adequate governance, compliance, consultation

- Montreal process => internationally agreed Criteria and Indicators
- Criteria = components of sustainability; things people care about
  - Biodiversity
  - Productive capacity
  - Ecosystem health
  - Soil and water
  - Carbon stocks
  - Socio-economics
  - Legal and institutional frameworks
- Indicators = parameters of criteria, measurable, tracked over time
- Extensive consultation





## ...and for a bioenergy industry

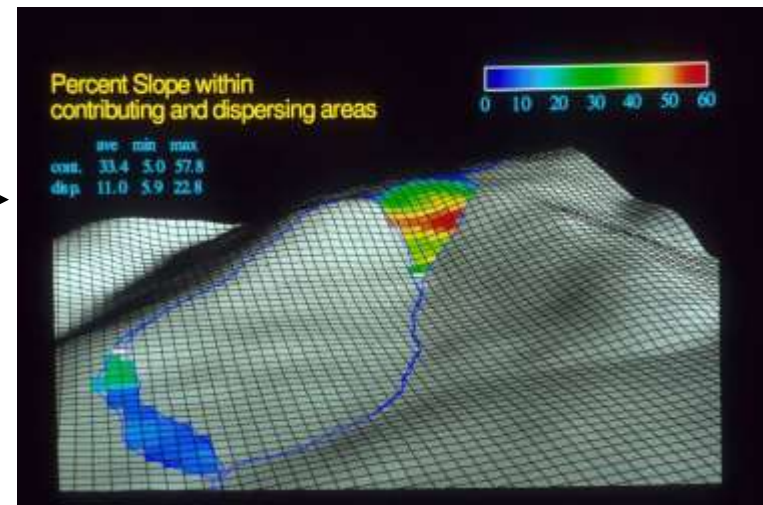
- NSW => comply with the Round Table for Sustainable Biofuels ver 0.
- June 2011, Australian Government => work with the Biofuels Association of Australia and ISO
  - develop internationally agreed sustainability criteria that can be applied to industry
  - to ensure that support for biofuels does not compromise sustainable production practices
  - provide greater impetus for moves towards advanced biofuels.
- **Process through Standards Australia**
  - Signing up a Mirror Technical Committee to participate in ISO and Interim Australian Standard
  - commences December 2011

# Key issues to address in Australia

1. Science development: currently fragmented, needs structured approach to the science of sustainability
2. Science-policy linkages
3. Engagement - develop of standards, on ground assessment, policy and also fora for negotiation and discussion
  - Governments State and Federal
  - Industry – growers, conversion industrie(s), distributors, users
  - Communities – consumers, green groups, CMAs
  - International engagement for science, harmonisation of standards, learning at practical experience but also for trade and GATT, WTA
4. Implications for other industries
  - Forestry and biofuels formal standards and certification, agriculture has 'best practise' approach.

# 1. Science development and challenges

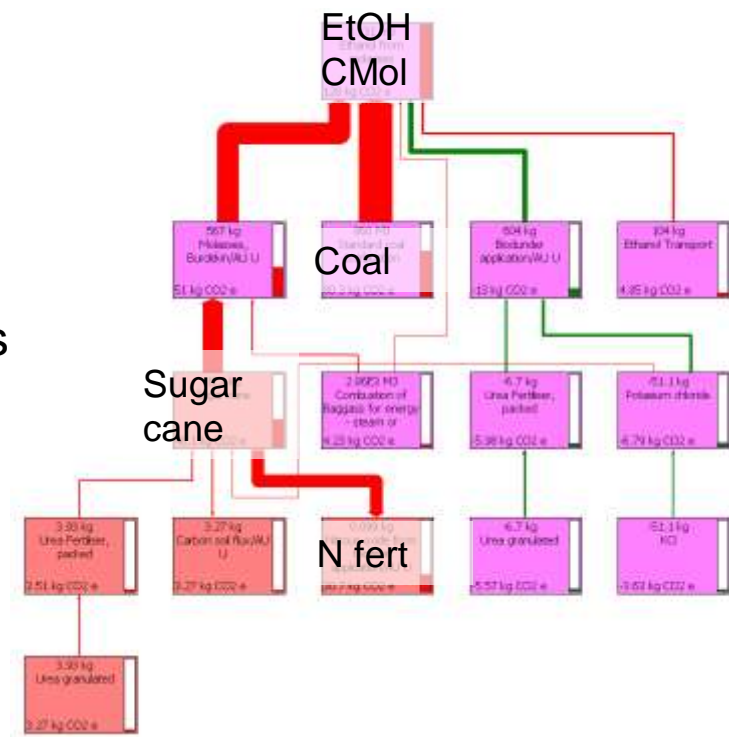
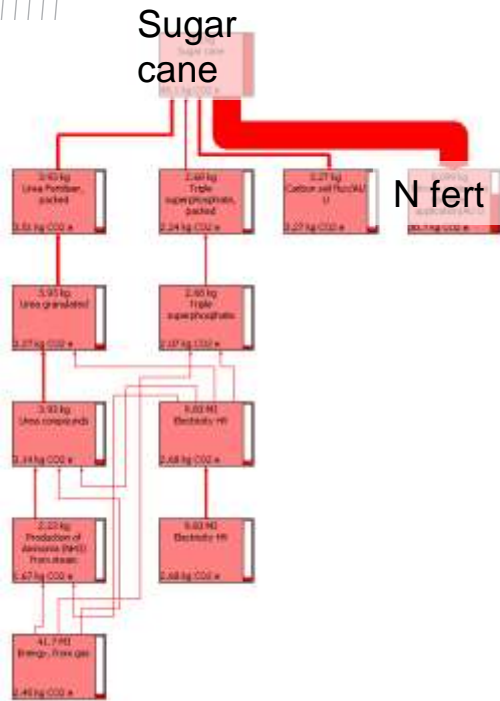
- Internationally agreed+locally relevant Indicators – science and process
- Science and measurement for indirect effects
- Scaling up for aggregate impacts
- Metrics for spatially dependent arrangements eg biodiversity
- Lack of methods and process to integrate and evaluate tradeoffs
- Data sparse, many are input based rather than outcome based



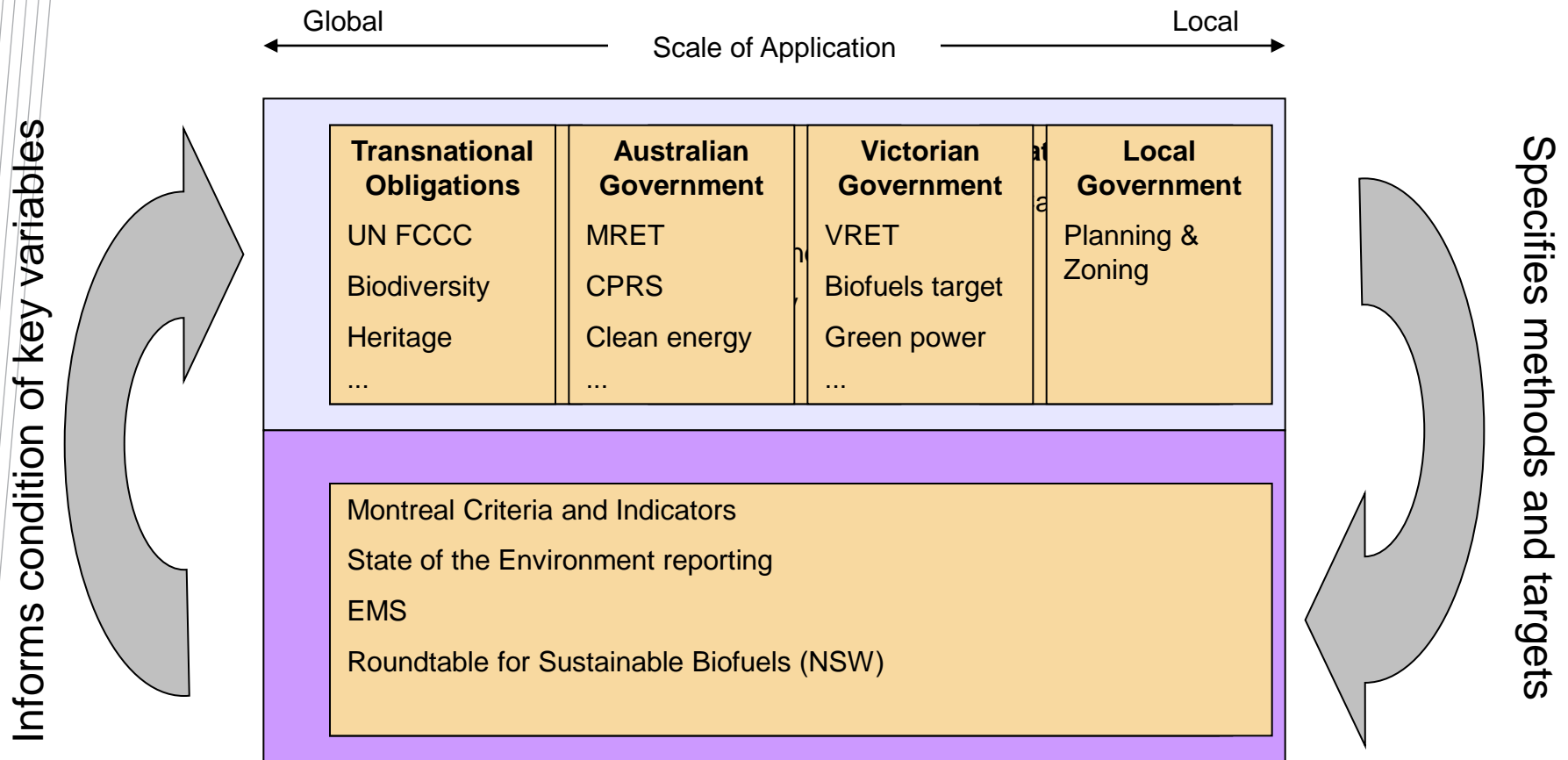
# LCA – important tool, lack data, poor app of methods/interp, not a sustainability assessment

## Life cycle analysis

- Complex methods and interpretation
- System boundaries critical
- Data sparse, uncertain, unavailable
- Not always valid to directly compare studies
- Tradeoffs between diff dimensions is a social process
- N fertilisers - growing cane
- Coal - mill



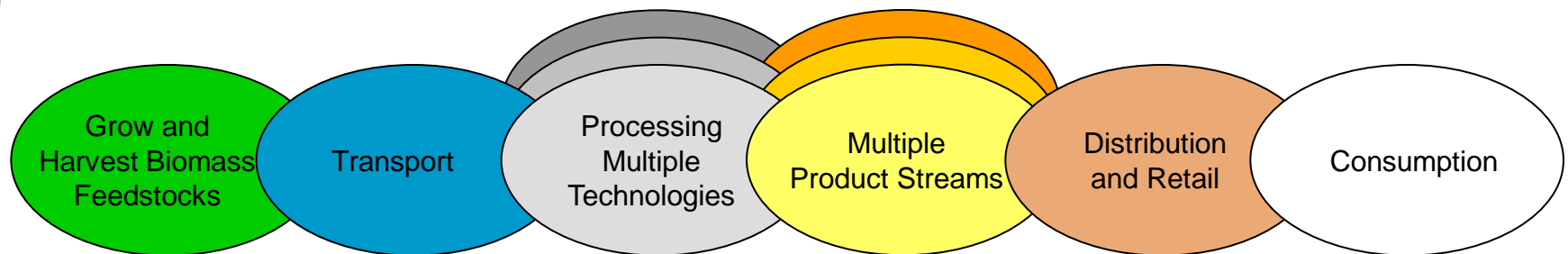
## 2. Linking science and policy in sustainability



# 3. Engagement

**Communities of consent provide a license to operate through**

- formal compliance with international to local laws etc
- public opinion and demand



- Farmers
- Foresters
- Land owners
- Land managers
- Governments, transnational orgs
- NGOs...

- Transport companies
- Neighbours
- ...

- Energy suppliers
- Manufacturers
- Governments, transnational orgs
- NGOs...

- Competitors and incumbents
- Consumers

- National and international markets and trade
- Retailers
- Distributors
- ...

- Consumers
- Governments, transnational orgs ...

### 3. Engagement forums required

- Biofuel is the only option for reaching ambitious GHG reduction targets in aviation
- Year-long process to
  - Increase level of understanding
  - Quantify benefits
  - Challenges to investment eg risk of new technologies, capital raising, uncertain policy environment
  - Pathway to move forward

⇒ significant industry capacity-building and leadership in aviation

⇒ Processes required for industry engagement and capacity-building for sustainability standard



Graham et al 2011, *Flight path to sustainable aviation: towards establishing a sustainable aviation fuels industry in Australia and New Zealand*, CSIRO.



## 4. Upstream impacts other industries

- Bioenergy industry bears 'burden of proof'
- Impacts on agriculture from bioenergy compared to other fossil fuel actors eg CSG
- Approach to deal with broader land sector
  - Forestry already has formal standards (Australian Forest Standard AFS), certification (eg FSC), and international reporting obligations (Montreal protocol), able to track chain of custody
  - Agriculture has 'best practise' approach and none of the above mechanisms in place
  - => sourcing biomass from agriculture will require strong engagement from this sector



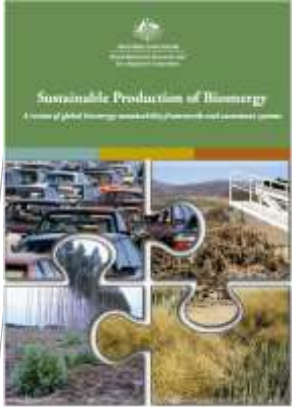
# Effective systems = link institutional + assessment systems; robust science + engagement/consultation



Local production?  
Imported from where?  
Robust credible measurement?  
Sustainable outcomes?



# Sustainability - an essential industry enabler



## Standards Australia and Biofuels Association of Australia

- Participate in ISO process and Interim Aust Std
- Much work to be done in Australia to
  - Engage internationally
  - Adapt C&I so that relevant to Australian context
  - Develop and apply scientific methods and assessment production systems
  - Build industry capacity





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# *Thanks folks!*

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