MAUNSELL | AECOM

Accounting for Climate Change and Peak Oil in Planning and Infrastructure Development in South East Queensland

Scott Losee, Associate Director - Sustainability

December 2008

MAUNSELL | AECOM

Thesis

- The issues of **climate change** and **peak oil**…
- in relation to policy, planning and public **infrastructure** development…
- are being handled in a **sequential pattern** of:
  1) Mitigating greenhouse gas emissions
  2) Adaptation to climate change
  3) Peak oil

- Local governments
- Regional cooperative governance led by State of Qld

MAUNSELL | AECOM

Terms

Mitigation

- Intervention to reduce the source of, or enhance the sinks for, greenhouse gases

Adaptation

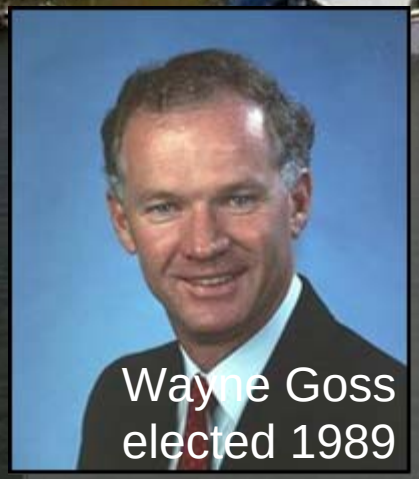
- An adjustment in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits opportunities

Peak Oil

- For fundamental geological reasons, global conventional oil production will reach a peak and then start an irreversible decline soon enough to be of concern

Queensland 1988 to early 1990s Mini-Enlightenment

Brisbane Expo ‘88



Wayne Goss elected 1989

Sir Joh Bjelke-Petersen

Harbour Board to Government Owned Corporation
‘Asset’ providing ‘returns’ to government

MAUNSELL | AECOM

Demand and Efficiency

- Transport
  - Further distances travelled
  - More trips made per person
  - Vehicle **occupancy** lower
- Energy
  - Penetration of inexpensive **air-conditioners**
  - Consumer appliances and standby power
- Urban Development
  - Larger houses, fewer **people/household**
  - Housing energy regulations late
- Water
  - No checks on demand until the region nearly ran out in the **drought**

MAUNSELL | AECOM

Infrastructure Development SEQ: 1990s to early 2000s

- Neither controlling **population** growth nor maximising **efficiency** seriously considered
  - until Target 140 water campaign in 2007

Largely **failed** to take into account

- Implications for GHG **emissions**
- Potential impacts from changing climate
- Peak oil **phenomenon**

Result:

- Carbon-intensive, oil dependent land-use pattern planned for past climate

Government **Ramping-up** Infrastructure Investment (e.g. Minister Paul Lucas at Trackstar Rail Alliance, 2007)

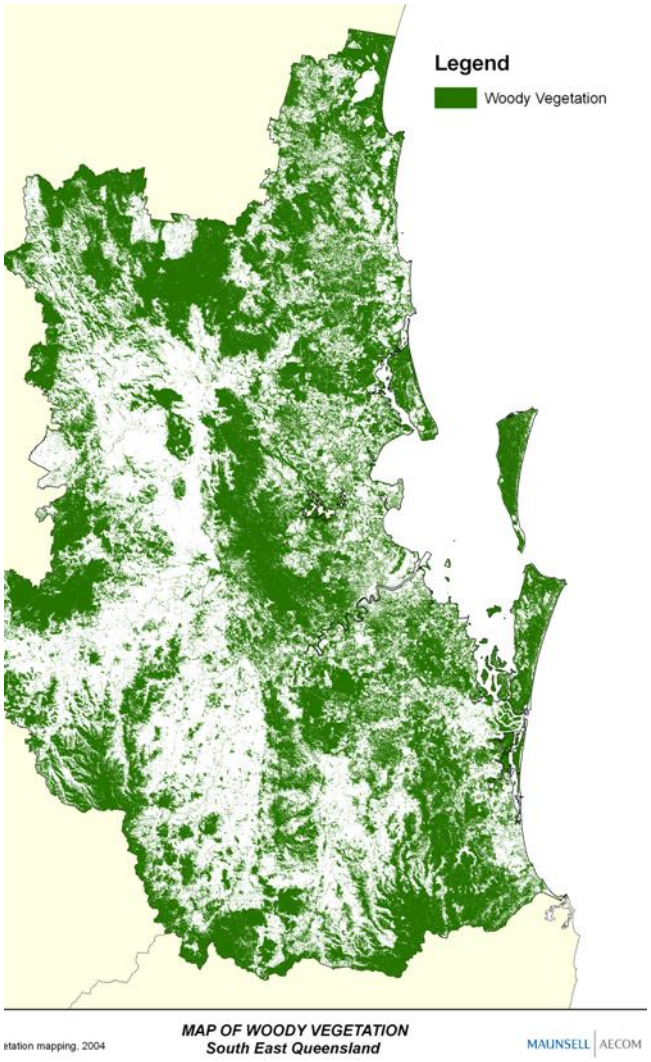
MAUNSELL | AECOM

Range of Policies Now… but Action?

MAUNSELL | AECOM

Specific Planning Initiatives

1. Brisbane City Council's Climate Change and Energy **Taskforce**
   - Aug 2006 – Mar 2007
   - Mitigation, adaptation & peak oil
   - Independent advice to Council
2. BCC's GreenHeart – **CitySmart**
   - Follow-up to CCETF
   - Largely mitigation 'soft sell' measures
3. SEQ **Regional Plan**
   - Review of climate change content
4. Related **infrastructure** projects
   - From SEQ Infrastructure Priority Plan



Mitigation

Solving the problem

MAUNSELL | AECOM

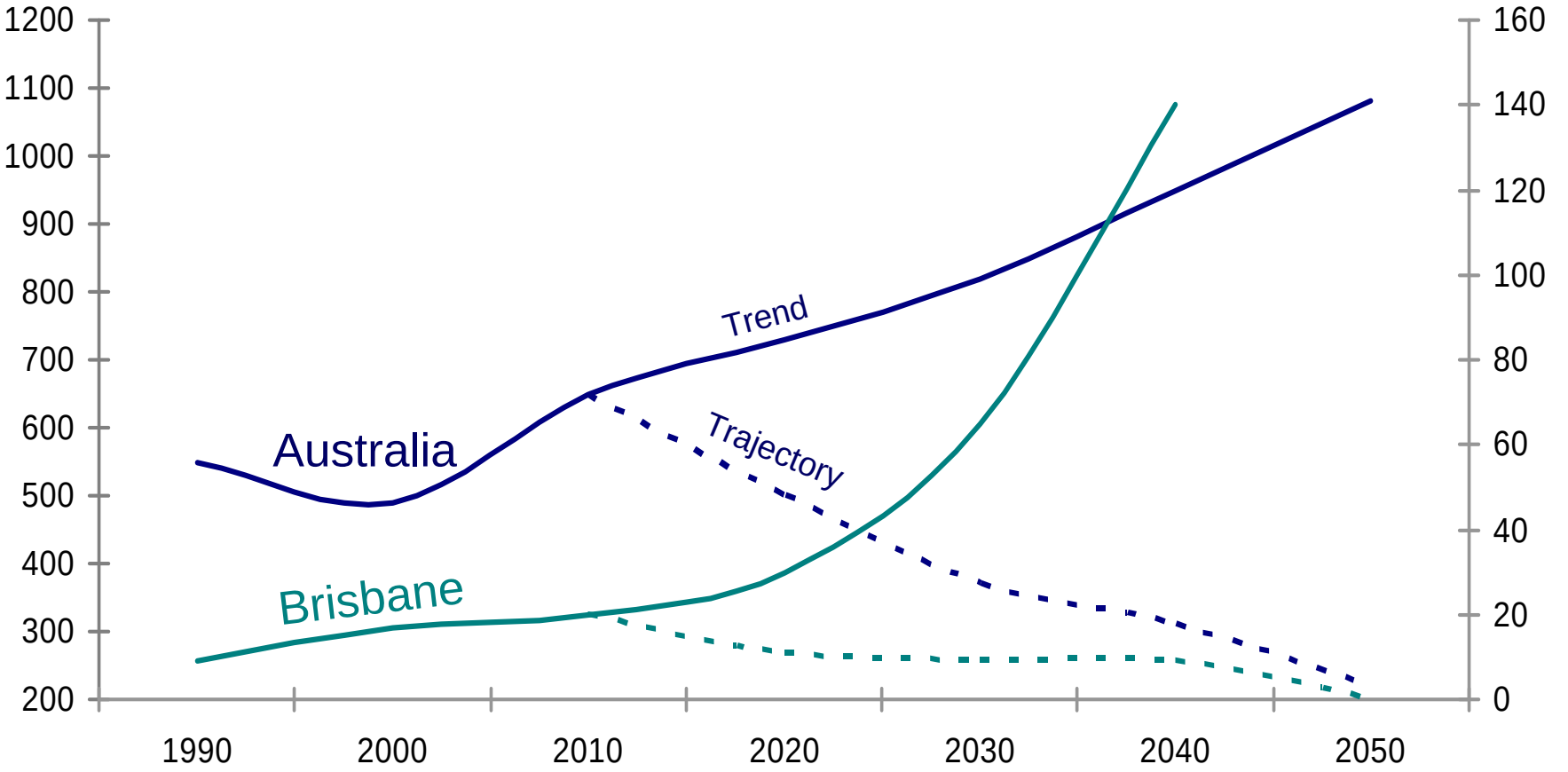
CC&E Taskforce

- Taskforce made **23** recommendations related to GHG mitigation and sustainable energy, including:
  - Buying and promoting **renewable** energy
  - Carbon **offsetting** and carbon sink development
  - Public **transport**, walking and cycling and alternative fuels
  - Urban form and **planning**

MAUNSELL | AECOM

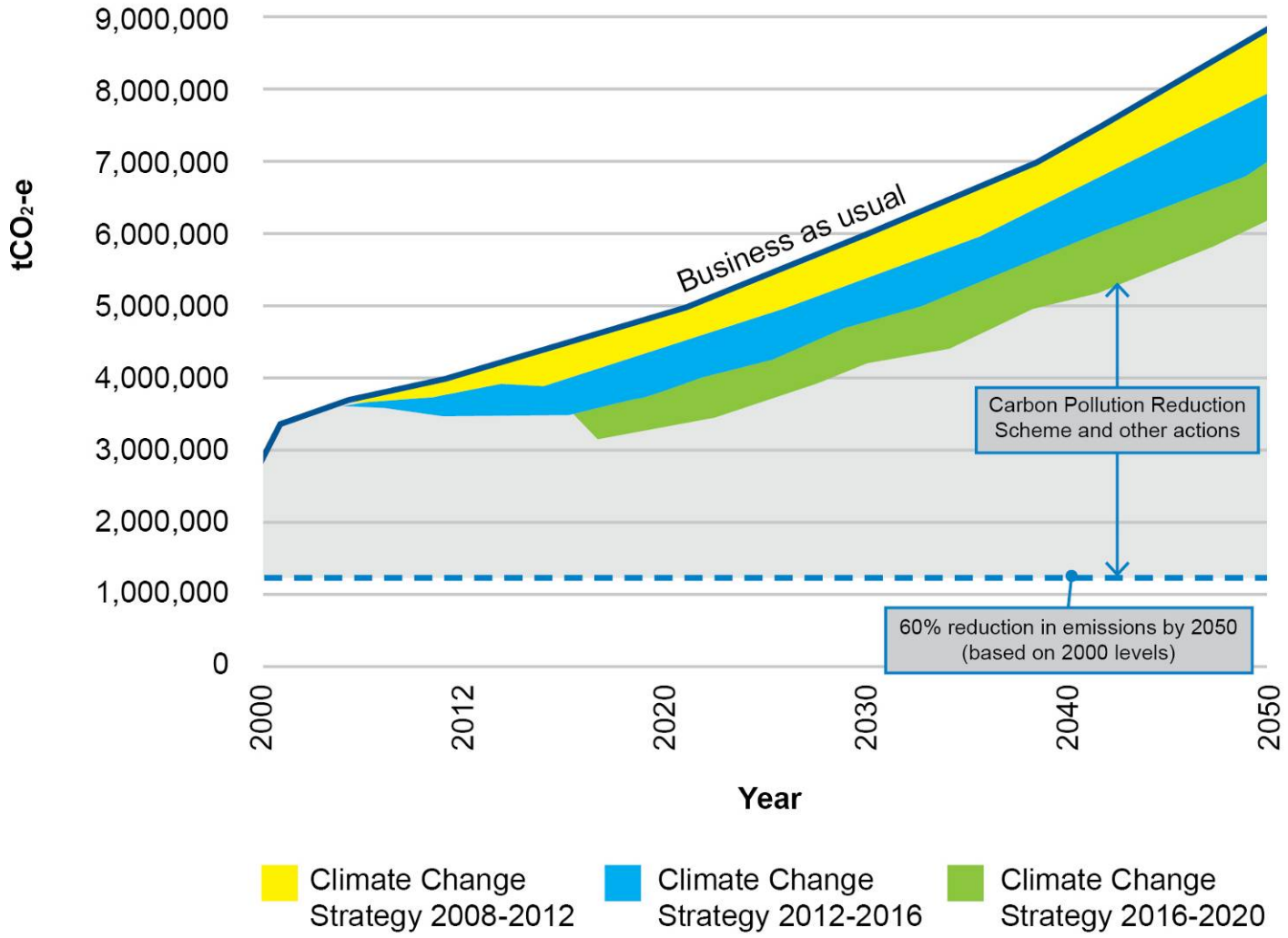
Greenhouse Emission Trends – Australia v. Brisbane

Illustration (Mt/y)



MAUNSELL | AECOM

Context for Another SEQ Local Government's Efforts



MAUNSELL | AECOM

Green Heart CitySmart

- BCC's program to 'make Brisbane Australia's most sustainable city'
- Aiming for carbon **neutral** by 2026
- Households emit 16 t/y
- First target: 10 t/y by 2012
- But 'to **stop climate change**, each person on the planet should be emitting no more than 1 t/y'
- 'This is our final carbon footprint target – **one tonne for everyone**'
- Green Heart CitySmart will provide practical advice, information and tools 'to help you **be wise, minimise and neutralise** your carbon footprint'

MAUNSELL | AECOM

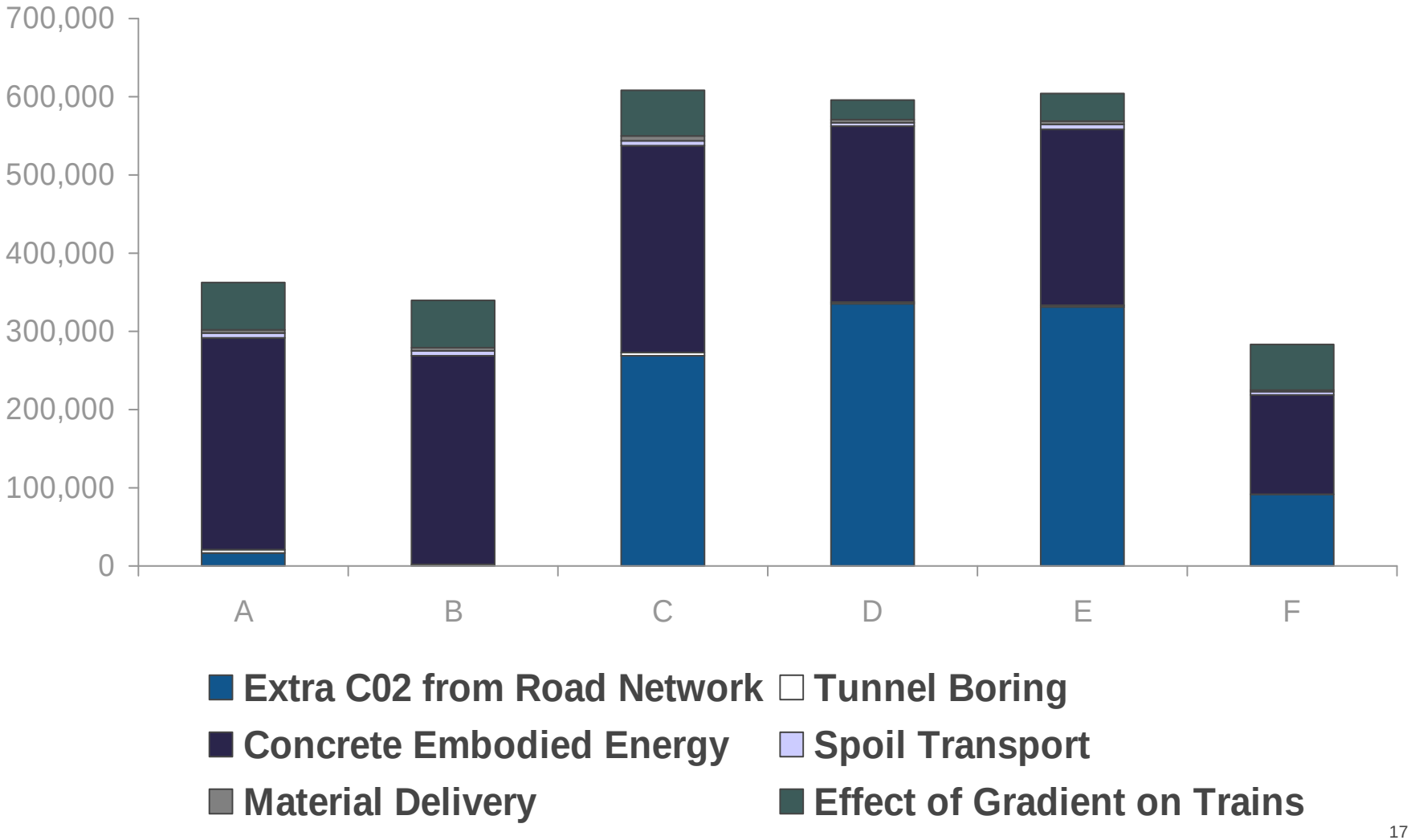
SEQ Regional Plan

- 2005 version - **atmosphere** section
  - **Broad** statements about energy efficiency, transport systems, land use, community awareness
  - Main impacts in **land use-transport**:
    - Contain urban settlement
    - Encourage TODs
    - Enhance public transport

- **Options** in revision?
  - Refine sustainable transport policies
  - Energy efficiency by **retrofitting**
  - Natural **gas** and distributed generation
  - Bio-sequestration

MAUNSELL | AECOM

Carbon Footprint of Options in Major Passenger Rail Project



MAUNSELL | AECOM

Carbon Management & Infrastructure Projects

1. Emissions from **construction**
   - e.g. project office electricity, diesel consumption and embodied emission in concrete

2. Emissions due to **landscape** changes
   - Tree removal and planting

3. Emissions over a set nominal period of **operation**
   - e.g. 30 years

Adaptation

Coping with unavoidable changes

MAUNSELL | AECOM

Michael's Story – Brisbane 2030 Scenario

Fictional 60 y/o Bayside resident, born 1970

Invested in solar panels and rainwater tanks

Petrol $10/L

Cyclone hit SEQ in 2020

Rationing energy, water in 2025

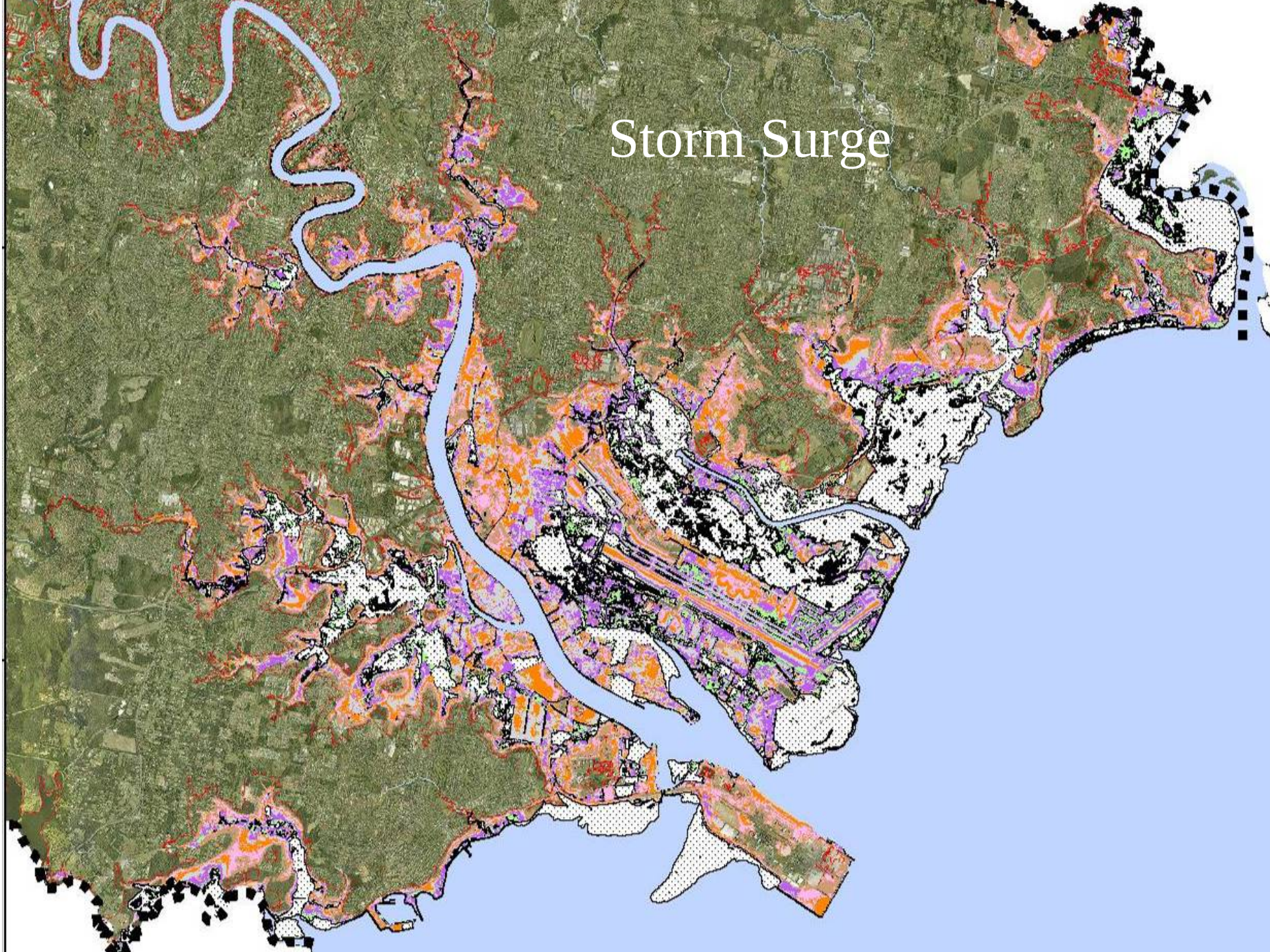
Mosquito-borne diseases

Economic growth in sustainable industries

MAUNSELL | AECOM

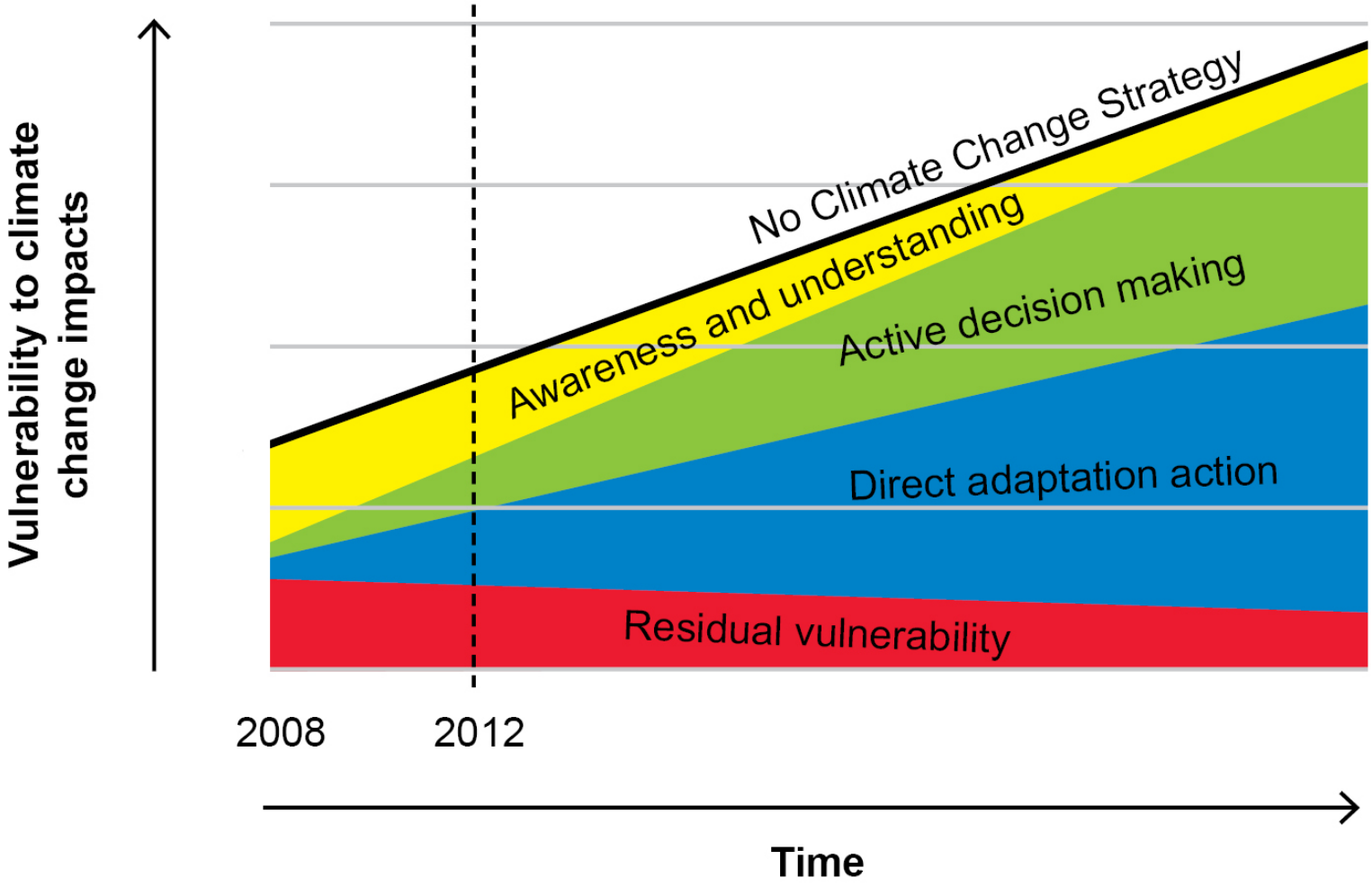
CC&E Taskforce 'Highest Priority Impacts'

- Risk to **life** & property
- Rising prices for food, etc.
- Less reliable **water** supply
- Effects on low level WWTPs
- Air-con **electricity** demand
- Demand spike for PT
- **Extreme** transport disadvantage


Storm Surge

MAUNSELL | AECOM

Coastal City – Addressing Climate Change Vulnerability



MAUNSELL | AECOM

SEQ Ideas/Options - 1

- **Map** region's vulnerability to different climate change variables
- Climate change vulnerability **assessments** (regional/local)
- Determine areas:
  - Not suitable for **development** and infrastructure
  - For **priority** application of standards and conditions that promote **resilient** communities
- Planning schemes to **limit** development in vulnerable areas

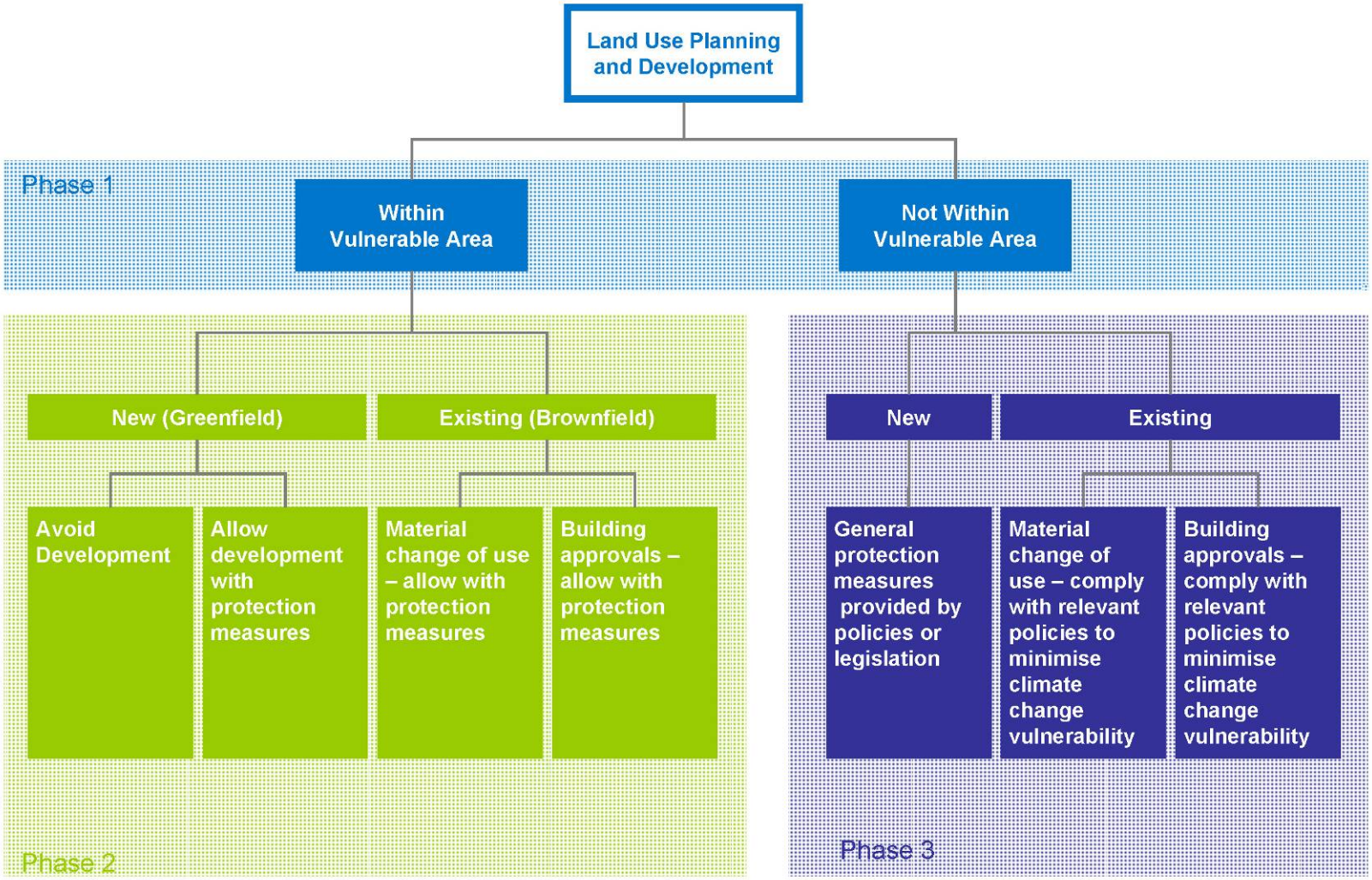
MAUNSELL | AECOM

SEQ Ideas/Options - 2

- Review natural **hazards** planning
- Built form - resilience in design, location, construction and operation
- Restrictions for **existing** development in vulnerable areas
- Settlements and emergency **refuges** accessible by routes with high resilience
- Natural **resource** diversification
- Infrastructure – diversification, small scale, **decentralised**
- Staged Infrastructure delivery for **adaptive** management

MAUNSELL | AECOM

SEQ - Logic of Land Use Planning Requirements



MAUNSELL | AECOM

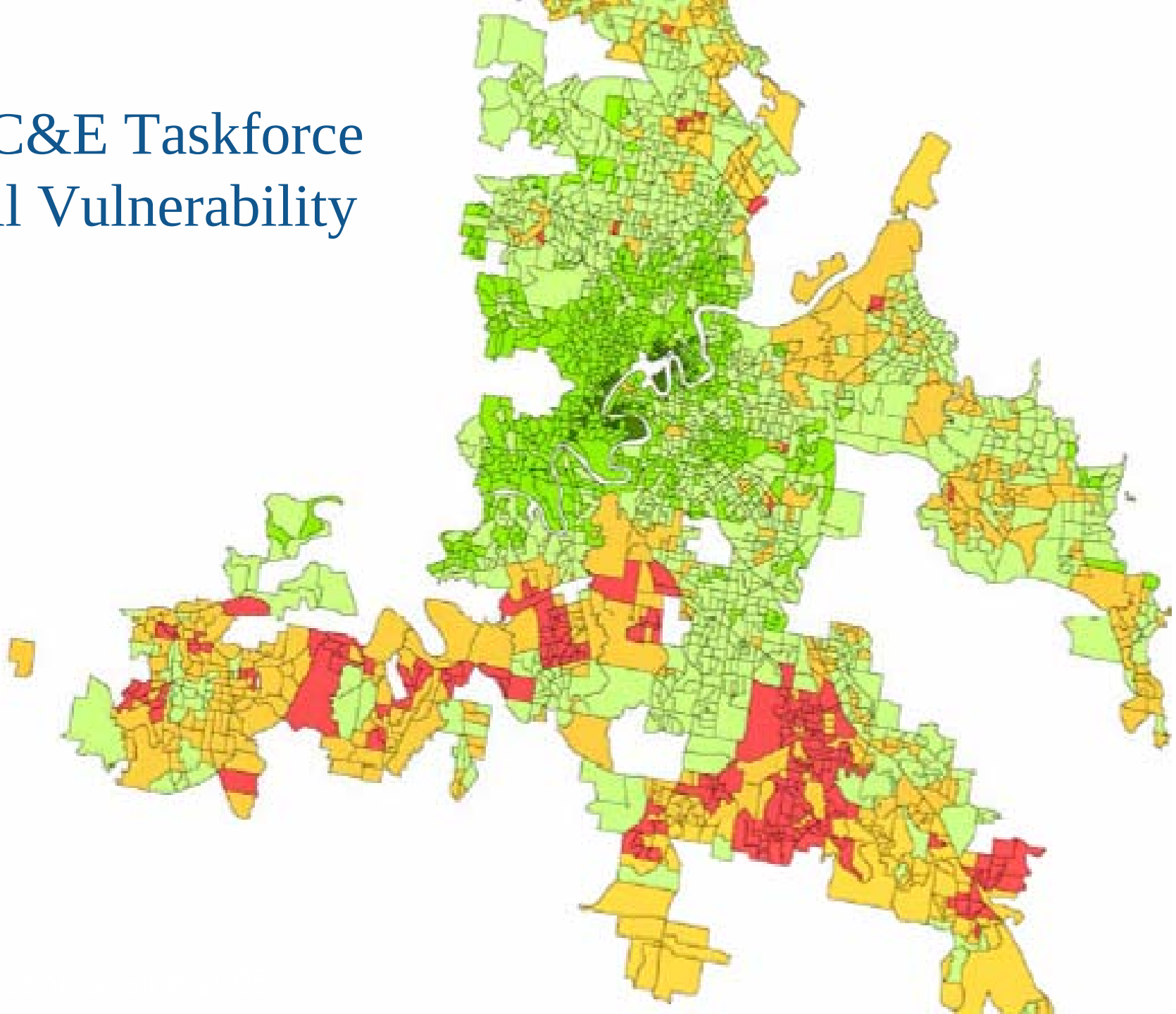
Infrastructure Adaptation

- Tools for assessing **vulnerability**
  - Localised climate information – **modelling**, spatial data
  - Infrastructure assessments
  - Planning, maintenance and **renewal**
- Change in **materials** selection
  - Life expectancy and maintenance regime
- Change in **design**
  - Move from historic basis to forecasting
  - **Scenario** planning
  - Precautionary principles
- **Innovation**

Peak Oil

Confronting the reality

- CC&E Taskforce
  Oil Vulnerability



MAUNSELL | AECOM

Peak Oil – Too Hard Basket?

- Actions adopted **where consistent** with other policies
  - E.g. public transport, urban form
- Investment in big transport infrastructure, including **roads** and **tunnels**, is a political priority
  - Petrol price and ‘congestion’ are political hot potatoes
- Assumptions:
  - Petrol **affordable** for at least 3 generations; or
  - Some **magical** technological fix will appear

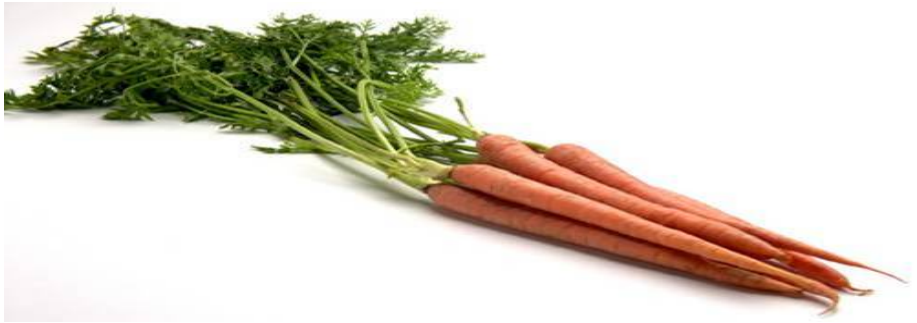
Discussion

CC&E Taskforce - Principles Applied by Councillors

1. Actions should be **practical** and understandable to community
2. Focus on '**building blocks** of our community' - houses, apartments, offices, commercial properties
3. Focus on what Council can **control**
4. **Avoid** high level targets. Actions within current **budget**
5. Emphasise **information**, education and leadership over regulations and disincentives (i.e. 'carrot not stick').

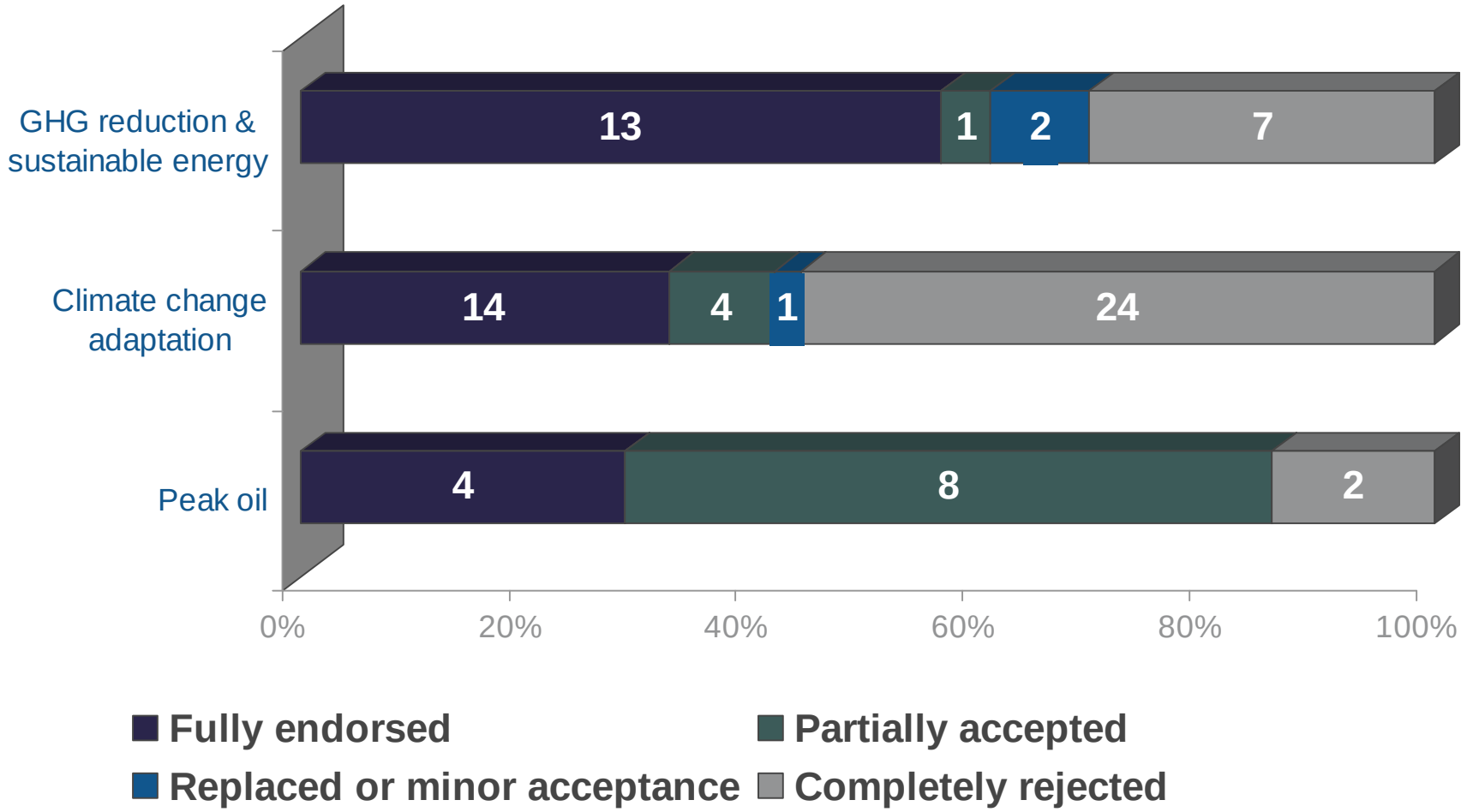
'I support the Lord Mayor and his four principles in this debate.'

- Deputy Mayor Hinchliffe



MAUNSELL | AECOM

Degree of Acceptance – CCETF Actions



MAUNSELL | AECOM

Levels of Scepticism – Acceptance

- IPCC too conservative
- Accept it is happening/human-caused
  - IPCC position
- Accept that there is a risk
- Scepticism
  - Informed, considered information
- Denial
  - 'I prefer to be optimistic'

MAUNSELL | AECOM

‘I was **alarmed** when I read the draft report. The agenda seems pretty clear: to force an acceptance as inevitable the **doomsday** scenarios based on, from what I can see, **computer** modelling, and to embark on a sort of **McCarthyist** crusade against anyone who questions the new **faith**.’

– Councillor, Brisbane City Council

MAUNSELL | AECOM

Conclusions

- **Lifestyle-democracy** link makes tough decisions challenging for governments
- Adapt design and construction of infrastructure to **future** climate
  - Clear room for improvement
- Ironically, peak oil might hit us **soonest**
- **Priority** should go to infrastructure that will reduce:
  - Carbon intensity
  - Oil dependence
  - Vulnerability to climate change impacts

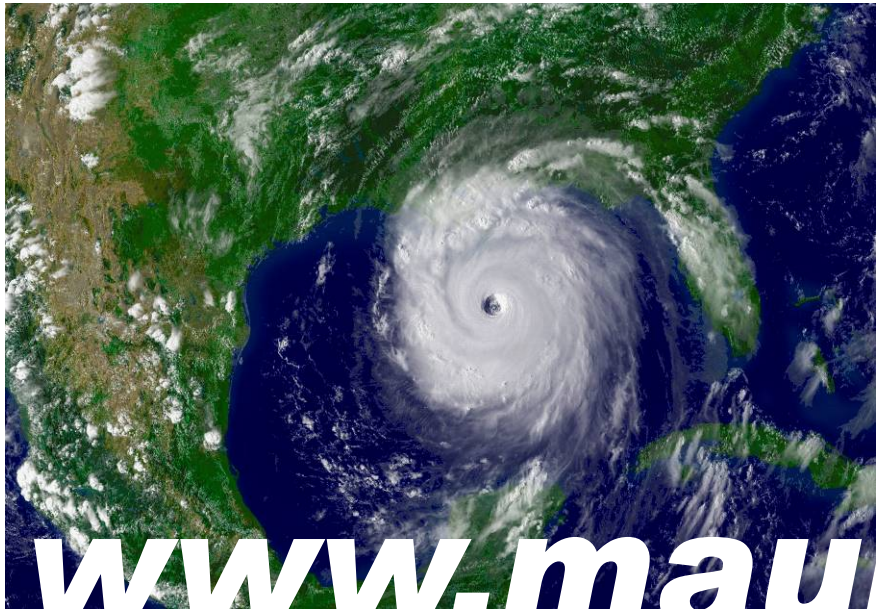
MAUNSELL | AECOM

Thank you!

Scott Losee
Associate Director – Sustainability
scott.losee@maunsell.com
Brisbane, Queensland, Australia
Mobile: +61 4 0446 7228
Direct Dial: +61 7 3858 6739

James Hughes
Senior Consultant - Sustainability & Environment
james.hughes@maunsell.com
Auckland, New Zealand
Mobile: +64 21 457 792
Telephone: +64 9 336 5302

Michael Nolan
Principal Consultant – Sustainability & Climate Change
michael.nolan@maunsell.com
Melbourne, Victoria, Australia
Mobile: +61 4 0972 1998
Telephone: +61 3 9653 1234



www.maunsell.com