



Department for Planning and Infrastructure  
Government of Western Australia

## **Urban Development Institute Australia (WA)**

**Climate Change Challenge  
16 September 2008**

## **Government's Perspective**

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Department for Planning and Infrastructure



Prediction is very difficult, especially about the future. –  
*Niels Bohr*





## Climate Change Impacts and Development

### ➤ Predictions:

- IPCC - average sea level rise of 18-59cm (median of the mean is 38cm) over the next 100 years, with a further 10 – 20cm rise if the polar ice cap melt is greater than predicted (extreme predictions of up to 4m have been made);
- More frequent/more intense storms, especially affecting coastlines;
- Changing rainfall patterns – some areas drier and some wetter;
- Higher overall temperatures;
- More weather extremes



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## The Policy Challenge: Finding the Balance





## Policy Response

- Mitigation of climate change
  - Reduce emissions of greenhouse gases:
    - Reducing fossil fuel energy demand
    - Reducing motorised travel demand
    - Geo/bio sequestration of carbon
- Adaptation to climate change
- Adaptation to mitigation measures



## Carbon Pollution Reduction Scheme (CPRS)

- CPRS the primary instrument used to control emissions from 2010 onwards.
- Suggests a strong economic case for expanding energy efficiency policy measures
- Efficiency measures will assist with the smooth transition to a low-carbon economy



## Energy Efficiency of Buildings

### ➤ Commercial Sector

- Increase energy efficiency requirements for commercial buildings from 2010
- Develop a national rating tool to cover a wide range of building types
- Government to demonstrate leadership to improve the performance of the buildings they own or occupy



## Energy Efficiency of Buildings Cont'd

### ➤ Residential Sector

- Increasing energy efficiency requirements for new residential buildings
- Mandatory disclosure measures for existing residential buildings (possibly point of sale)
- Roadmap for further improvements in residential sustainability

### ➤ Appliances & Equipment

- Increased minimum performance standards and labelling to cover a range of appliances



## Energy Efficiency of Buildings Cont'd

### ➤ Industrial Sector

- Assistance for smaller firms in the industrial sector to prepare for the CPRS
- Developing a strategic plan to support industrial energy efficiency
- Reports to COAG on vehicle fuel efficiency and travel demand management opportunities in Australia



## Responsive Development Industry Initiatives

- Subdivision Orientation
  - Orientation of lots to help achieve improved energy efficiency
- Mitigation - Sustainability Planning Tools
  - eg UDIA EnviroDevelopment and emerging national assessment tools, incorporating climate change factors
- Network City and TODs
  - Integration of land use and transport
  - Travel demand and family affordability
- Development Controls
  - Reflecting improved standards in the built form at the planning level



## Coastal Vulnerability and Resilience

- Vulnerability Concepts:
  - slowly accumulating effects versus severe impacts
  - capacity of a system or individual to cope (resilience)
  - thresholds associated with extreme events
- A coastal community, an ecosystem, an economic sector or industry is considered vulnerable to climate change if it is susceptible to, but unable to cope with, the adverse effects of climate change impacts
- Degree of vulnerability and extent of resilience



## Storm Surge

- Event of greatest concern across the coastal zone



**Mandurah**



**Storm Erosion at Port Beach**



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**Busselton**



## Other Impacts

- Changes to:
  - Wave climate (average wave energy and direction)
  - Winds
  - Rainfall
  - Temperature
  - Flooding
- Impact on the physics, chemistry, biology and social functions of coastal ecosystems





## Socio-Economic Impacts: Infrastructure

- Coastal zone
- Coastal water resources
- Population growth
- Need for baseline modelling, so that areas of risk can be better understood





## Emerging National Action Program

- Commonwealth and States working through CoAG to develop a national climate change adaptation program
- Priority actions identified for consideration



## To develop nationally consistent strategic planning approaches and tools for coastal development

- National benchmarks for key variables for climate change scenarios to inform planning decisions
- National guidelines on risk based approach for estuaries and foreshores
- National position paper on liability and responsibilities as a result of climate change impacts



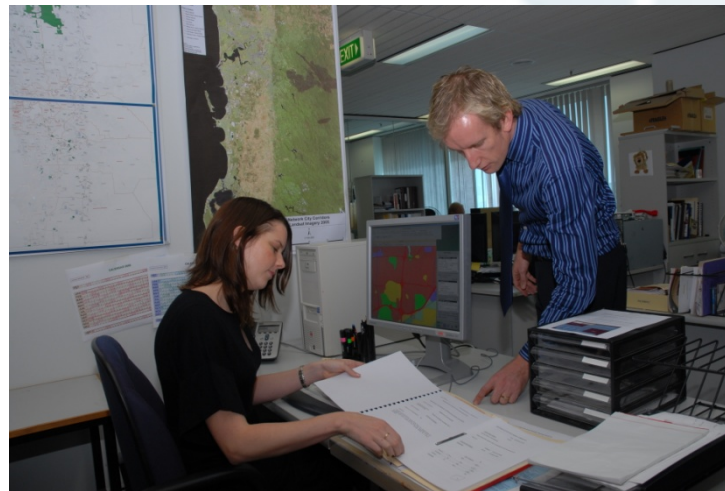
## To develop research and monitoring programs to support decision making and evaluate the effectiveness of policy and programs

- Address key information gaps and incorporate into vulnerability assessments and monitoring programs
- Develop better understanding of the socio-economic dimensions of resilience to climate change impacts
- Build on existing national initiatives and protocols



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**To provide training for mainstreaming climate change into planning and management at local government level, in particular in risk based approaches and use decision support tools such as economic tools**





## To strengthen coordination of government action at national state, local government level and across sectors

- Review of the implementation of the 2006 NRM Ministerial Council National Approach to Integrated Coastal Zone Management
- Develop a National Approach to Coastal Policy
- Facilitate greater coordination between NRM and COAG processes
- Strengthen regionally based integrated planning processes



## Vulnerability Assessments and Policy Development

- Development of a Digital Elevation Model (DEM) for the Australian coastline:
  - Commonwealth – “first pass” assessment (5m resolution)
  - WA (DPI proposal) - Swan Coastal Plan from Yanchep to Cape Naturaliste (0.15m resolution)
- Collect bathymetry data for the near-shore marine area out to a depth of 20 - 30 metres
- Link to climate change impacts to predict coastal flooding and erosion



## Vulnerability Assessments and Policy Development – Cont'd

- Allow for other applications of DEM in engineering, communication, and transport industries, eg:
  - modeling of tsunami and storm surge impacts on coastal environments and communities
  - mapping of drainage systems for water availability and distribution evaluation and mapping of wetlands, littoral and other ecosystems
  - landscape evolution and vegetation mapping, including carbon accounting



## Vulnerability Assessments and Policy Development – Cont'd

- More detailed coastal vulnerability assessments are required
- Objective – predict local impact of different climate change scenarios for three timeframes: 2030 , 2070 and 2100
- Focus - priority areas for coastal engineering assessments, eg Busselton, Albany, Lancelin, Exmouth and Mandurah



## Vulnerability Assessments and Policy Development – Cont'd

### 2003 State Coastal Planning Policy No. 2.6

- How to assess coastal setbacks that take physical processes into account
- Policy review when national benchmarks emerge and the implications of local vulnerability assessments become clear
- Cottesloe work identifies:
  - importance of having a detailed knowledge of the geomorphology and geotechnical characteristics of each coastal segment
  - reducing the band of uncertainty



## Adaptation Responses

- Improving our understanding of vulnerability (and resilience) of **existing** infrastructure and settlement
- Enhance our knowledge of potential risks when planning infrastructure and settlement patterns **in the future**
  - ensure new coastal development and infrastructure is not placed in vulnerable areas
- Not all doom – potential opportunities for innovative developers
- 6 main adaptation measures for planners and decision-makers



1. Increasing risk awareness and being prepared
2. Increase capacity of existing measures
3. Spatial planning
4. Strengthening defences
5. Managed retreat from vulnerable areas
6. Strengthening and/or moving seaward with coastal protection measures





## King Canute

