Assessing Climate Change Vulnerability and Resilience in a Commercial Property Portfolio

2013 Local Government Planners Forum

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### Property Portfolio

#### Commercial Portfolio

- **Retail**
  - (page 7)
  - 41 properties
  - 930,955 m² GLA
  - Valued at $5.2 billion

- **Office**
  - (page 25)
  - 18 properties
  - 418,238 m² NLA
  - Valued at $1.7 billion

- **Industrial**
  - (page 35)
  - 12 properties
  - 967,465 m² GLA
  - Valued at $0.8 billion

#### Residential Portfolio

- **Residential Communities**
  - (page 41)
  - 70 communities
  - 86,000 lots
  - End-market value approximately $22.0 billion

#### Retirement Portfolio

- **Retirement Living**
  - (page 61)
  - 62 established villages
  - 7,928 units
  - Development pipeline of 4,301 units

#### Unlisted Property Funds

- **Unlisted Property Funds**
  - (page 72)
  - Funds under management $387.5 million

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**Map of Australia with Property Portfolio Locations**

**Key**

- Retail
- Office
- Industrial
- Residential Communities
- Apartments
- Retirement Living
- Unlisted Property Funds

**Locations**

- Port Adelaide Distribution Centre
- The Grange Retirement Village
- Salford Retirement Estate
- Unity Retirement Village
Stockland’s Strategic Response to Climate Change

- Monitor
- Reduce
- Adapt
- Innovate
- Communicate

Tri-generation plant - 133 Castlereagh St

Solar PV installation – Stockland Green Hills
Strategy Development for Climate Adaptation

Step 1
What is industry best practice?
What are we doing already?
What are the drivers?

Step 2
What is climate adaptation and a changing climate?
How does Stockland fit into this picture?

Step 3
What is the exposure and adaptive capacity of the communities in which we operate?

Step 4
Do we understand the potential risks and opportunities?
How do we manage these?

Step 5
Develop an action plan
Prioritise the adaptation options

Step 6
Implement the strategy
Monitor and review
Moving from Strategy to Assessment

Stockland Climate Adaptation Strategy

March 2011

Climate vulnerability and resilience protocol

Stockland Green Hills
February 2012
Vulnerability and Resilience Assessment Criteria

- **Climate Effects** – predicted exposure to changing climate

- **Property Elements** – sensitivity and adaptive capacity

- **Climate Risks** – potential impact from climate effects
## Climate Effects - Predicted Exposure

<table>
<thead>
<tr>
<th>Climate effects</th>
<th>Summary of regional projections (2030-2070)</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Climate Zone</td>
<td>Zone 2</td>
<td></td>
</tr>
</tbody>
</table>
| Mean temperature change                  | 2030: Increase by 3% to 21.6°C  
2070: Increase by 17% to 26.1°C                                                                 | 2      |
| Extreme heat                             | Baseline: 16 days per annum > 35°C  
2030: Increase by 150% to 40 days  
2070: Increase by 300% to 64 days                                                                 | 3      |
| Mean rainfall change                     | Baseline: 811 mm per annum  
2030: Decrease by 14% to 698 mm per annum  
2070: Decrease by 17% to 674 mm per annum                                                                 | 2      |
| Extreme rainfall – inland flooding       | Baseline: 17 days per annum >150 mm  
2030: Increase by 29% to 22 days  
2070: Increase by 47% to 25 days                                                                 | 3      |
| Sea level rise – coastal flooding        | The 1-in-100-year storm tide event is projected to increase by 51 cm.                                                                                          | 1      |
| Drought (see note below)                 | 2030: Increase by 12% potential evaporation  
2070: Increase by 22% potential evaporation                                                                 | 3      |
| Wind and hail                            | See cyclone                                                                                                  | 3      |
| Cyclones                                 | 10% increase in cyclone intensity and frequency, as well as a 130 km shift southwards in cyclone tracks.                                                                 | 3      |
| Bushfires                                | Increase in bushfire risk – see map.                                                                         | 2      |
| Relative humidity                        | 7 -17% increase                                                                                               | 2      |
| **Overall Exposure Rating**              |                                                                                                              | **2.4**|
Property Elements – Sensitivity & Adaptive Capacity

• Location and design
• Structure
• Operation and Maintenance
• Utilities and Services
• Stakeholders
  – Authorities
  – Retailers,
  – Community
  – Contractors
Climate Risks – Potential Impacts

- Increased demand on HVAC systems
- Reduced integrity of roofing structures
- Overloading of stormwater systems
- Deterioration of building materials
- Reduced availability of potable water
- Local flooding, salt water intrusion
- Wind and hail damage
- Water and mosquito borne disease
- Bushfires, smoke penetration
- Increased landscape maintenance
- Expectation of community as a place of refuge

*Business disruption to our customers & possible rent losses*
What have we found?

Carpark floods 3-4 times a year

Metal roof screwed down
What have we found?

Additional rain heads installed to cope with extreme rain

HVAC sprayed with water on extreme heat days
What have we found?

- Hail damage to condenser coil
- Ductwork secured for cyclones
- Stormwater drains flood mall 2-3 times a year
- Thermal roof coating applied to reduce heat gain and heat island effect.
What have we found?

Car spaces are shaded or under cover providing comfort to customers

Stormwater Detention Tank – not to increase load on existing infrastructure
What have we found?

Creek runs under the centre and floods during extreme rain

Gardens die back during extended dry periods
What have we found?

Exterior cladding cyclone rated

White highly reflective roof sheeting; Roof mounted equipment secured

Shade cover over atrium

Rain tanks run dry causing gardens to die back during extended dry periods
Vulnerability and Resilience Scorecard

- A score from 1 to 3 is assigned to each criteria in each category
- Scores are aggregated and averaged for a category average
- Category scores are added for an overall score out of 9.

<table>
<thead>
<tr>
<th>Assessment criteria</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Climate effects – exposure</td>
<td>2.4</td>
</tr>
<tr>
<td>Property elements – sensitivity and adaptive capacity</td>
<td>1.8</td>
</tr>
<tr>
<td>Climate risks - potential impact</td>
<td>1.8</td>
</tr>
</tbody>
</table>

**Overall climate vulnerability and resilience** 6.0
Figure 1  Overall climate vulnerability and resilience of property

- Nominal vulnerability
- Low vulnerability
- High vulnerability
- Extreme vulnerability

- Extreme resilience
- High resilience
- Low resilience
- Nominal resilience

0 to ≤1  1.1 to ≥3  3.1 to ≥6  6.1 to ≥8  8.1 to ≥9

Locations:
- Townsville
- T’ville K Mart
- Rockhampton
- Cairns
- Hervey Bay
- Gladstone
- 2 Victoria Ave
- Durack Centre
- Green Hills
- Point Cook
- Wetherill Park
- North Shore
- Wendouree
- Victoria Ave
- Durack Centre
## Key Adaptation Actions

<table>
<thead>
<tr>
<th>Area</th>
<th>Proposed Actions</th>
<th>Benefits</th>
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</table>
| Maintenance & Operations |  - Continue installing roof fastening systems in vulnerable regions  
  - Maintenance of roof stormwater drainage systems  
  - Protection of air cooled HVAC equipment against hail damage  
  - Model performance of existing HVAC systems to increase in extreme heat days  
  - Embed extreme event responses into emergency procedures  
  - Raise awareness with stakeholders on responses for extreme events  
  - Include dialogue with local authorities around the use of centres for refuge |  - Reduced operating and maintenance costs  
  - Operational issues are addressed as climate adaptation responses  
  - Actions can be prioritised, investigated and rolled into asset plans over time  
  - Greater emergency preparedness and amenity where centres used for refuge  
  - New shopping centres can be future proofed through climate resilient design  
  - Potential insurance premium reductions  
  - Reduced risk of business interruption for retailers and rental abatement  
  - Improved indoor environment and comfort for retailers and shoppers  
  - Added community value as a safe and secure place of refuge during extreme events |
| Asset Planning        |  - Provide facility for ‘plug in’ emergency power supplies  
  - Provide shelter for carparks, outdoor dining areas, atriums, walkways  
  - Specify heat reflective and thermally insulating roof coatings |                                                                                                                                                                                                     |
| Design & Development  |  - Design for increased extreme heat days over 35 degrees in developments  
  - Design for increased rain events above 150 mm in developments |                                                                                                                                                                                                     |
thank you