

## CLIMATE RESILIENCE, LOCAL GOVERNMENT AND THEIR COMMUNITIES - WORKING PAPER

### *FINDING THE FUNDS NEEDED TO PROTECT OUR BUILT ENVIRONMENTS IN AN ERA OF CLIMATE CHANGE; Physical Risk Mitigation Infrastructure*

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#### **Authors**

The **South East Councils Climate Change Alliance (SECCCA)** is a group of 8 local governments in Melbourne's south east. SECCCA members collaborate to address climate change. SECCCA is one of 7 Victorian Greenhouse Alliances.

**The Insurance Council of Australia (ICA)** is the representative body of the general insurance industry in Australia. Its members represent approximately 95 percent of total premium income written by private sector general insurers. Insurance Council members, both insurers and reinsurers, are a significant part of the financial services system. The ICA has established a Climate Change Action Committee and a role to implement a strategy on behalf of industry.

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#### **1. Introduction**

In July 2019 the Victorian based South East Council Climate Change Alliance (SECCCA) and the Insurance Council of Australia (ICA) codesigned a session at the Victorian Greenhouse Alliances conference. The session discussed the following issues;

- how climate change is requiring local government to change the way they plan for, and invest in resilient built environments in an era of climate change?
- how can local government fund and build protection for their own, and privately-owned, assets (physical risk mitigation infrastructure)?
- how to quantify the financial impacts of climate change for local government?
- how to make the right investment decisions, and appropriately allocate resources? and,
- how to access public and private finance to enable investment that is needed?

Building on the outcomes of the workshop, this paper aims to catalyse actions that create a pathway for local governments to address the physical risks associated with more extreme, and potentially more frequent, natural hazards expected in an era of climate change.

#### *Physical Risk Mitigation Infrastructure*

Physical Risk Mitigation Infrastructure refers to any type of structure that protects assets and the community from the risks of damage or loss from extreme natural hazard events, including but not limited to flooding, storms and bushfire.

The purpose of this paper is to:

- initiate further discussion amongst local governments (CEOs, CFOs, asset, risk and sustainability managers) and stakeholders (e.g. insurance industry, state and federal governments, lenders and private equity firms) about the increasing frequency and intensity of physical risks, and commensurate damage and financial loss, that climate change poses to property and infrastructure, and

- to stimulate alternative means of funding physical risk mitigation infrastructure.
- to accelerate the delivery of physical risk mitigation infrastructure.

In an era of climate change it is possible that some assets in particularly exposed areas may become prohibitively expensive to insure.

The paper also seeks to explain how the Insurance industry is also deeply concerned about this issue and to explore how local government and the insurance industry could collaborate to develop and progress a series of actions that will mitigate the risks associated with climate change.

## 2. Climate Change, an imperative for Action

Australia's climate has changed, and the rate of change is increasing. The Bureau of Meteorology (BOM) and CSIRO released their biennial "State of the Climate" report in December 2018. Drawing on the latest climate observations, the biennial report provides a comprehensive analysis of Australia's climate and how it is changing.

The following are the key points taken directly from the report for Australia:

- Australia's climate has warmed by just over 1 °C since 1910, leading to an increase in the frequency of extreme heat events.
- Oceans around Australia have warmed by around 1 °C since 1910, contributing to longer and more frequent marine heatwaves.
- Sea levels are rising around Australia, increasing the risk of inundation.
- The oceans around Australia are acidifying (the pH is decreasing).
- April to October rainfall has decreased in the southwest of Australia. Across the same region May–July rainfall has seen the largest decrease, by around 20 per cent since 1970.
- There has been a decline of around 11 per cent in April–October rainfall in the southeast of Australia since the late 1990s.
- Rainfall has increased across parts of northern Australia since the 1970s.
- Streamflow has decreased across southern Australia. Streamflow has increased in northern Australia where rainfall has increased.
- There has been a long-term increase in extreme fire weather, and in the length of the fire season, across large parts of Australia.

Globally climate change is increasing the incidence and intensity of extreme weather events such as flooding, storm surge, erosion, bushfire, storm events, droughts and heat ([Climate Council, 2018](#)). In Victoria we can expect changes in typical weather patterns too, but the science is complex, and inherently uncertain. Localised projections are difficult, but broadly we can expect more extreme rainfall, exacerbating risk in already flood prone areas ([CSIRO, 2019](#)).

Climate change is creating a growing need for physical risk mitigation infrastructure; councils that are hazard prone are becoming more exposed and more vulnerable.

Climate change has evolved from being a purely ethical, environmental, non-financial issue, to one that presents material risks and opportunities within mainstream investment horizons (APRA, 2019).

With Councils such as Bass Coast Shire Council losing critical coastal infrastructure due to erosion, the imperative for swift yet considered action is clear. (<https://www.abc.net.au/news/2019-04-30/inverloch-loses-33-metres-of-beachfront-to-erosion/110542400>)

Science indicates, with high certainty, a range of startling projections for reduced consistent rainfall, increased storms surges and flooding and prolonged and more intense high-risk bushfire days. The time for deliberating the data has passed. regardless of political commitments to reduce greenhouse gases, that may or may not be realised, the deleterious impacts of climate change, superimposed on natural variability, will continue for generations. The severity of climate change from mid-century onwards will depend on global action in the next decades. There is a compelling case and obvious need to take action to protect our assets now.

The reality of the climate change is being experienced on a daily basis. Emergency services declared an official start to the bushfire season in many jurisdictions across Australia *during winter* (SMH, Aug 2019)

<https://www.smh.com.au/environment/weather/it-s-still-winter-but-parts-of-nsw-are-now-officially-in-bushfire-season-20190801-p52cum.html> . The bushfire season has seen fires on an unprecedented scale. At the time of writing the estimated damage/loss amounted to [\\$1.65Bn across approximately 20,000 claims](#). It should be noted that this is insured loss. It is likely that the total financial loss, just from the damage to property and assets could be double that. As well as stretching emergency services to capacity, catastrophe events of this scale begin to have an impact on the financial stability of our economy.

The impacts of climate change are being felt socially, economically and environmentally; the scientific projections we made about weather are materialising, and we are underprepared for the natural hazards we are experiencing. There is a compelling economic case for taking action soonest to mitigate the damage that catastrophes are inflicting. The sooner we act, the less damage will be done, and the more resilient we can be.

### 3. Background

Climate change is a significant financial risk for local governments and climate change has created a growing need for physical risk mitigation infrastructure. Recognising this, SECCA and the ICA codesigned a session at the 2019 Victorian Greenhouse Alliances conference to discuss what physical risk infrastructure is, why councils must start to plan how to deliver physical risk infrastructure that can withstand future impacts, how to prioritise mitigation projects by need (exposure, vulnerability) and how to access capital through Government or private capital.

The session brought together representatives from local government, state government, financiers NAB and Climate Bonds Institute, the Strategic Disaster Risk Guidance Project and the ICA to discuss this emerging issue of concern.

The session identified that:

1. This is a very complex issue, with many stakeholders, different levels of expertise and understanding of the problem.
2. There is a need for a consistent approach to how physical risk infrastructure is designed and prioritised across local government.
3. While there is limited finance available from council budgets, there is significant funding available globally, however this finance needs to be matched with 'investable' assets.
4. Methodology to enable councils to identify which assets are vulnerable to climate risk are very limited.

The session also raised the following questions:

1. What is the climate risk and what is the infrastructure that is needed to mitigate the risk?
1. What are the climate risks and mitigation infrastructure priorities? Are these the right priorities?
2. Does the climate risk and mitigation infrastructure exist inside municipal boundaries or will it need to be shared across municipal boundaries?
3. What are the opportunities for regional collaboration to maximise economic benefit?
4. What is the value of investment required?
5. What is the value that the investment will deliver?

6. What funding is available, what is needed to enable local government to access this funding?

#### 4. Physical Risk Mitigation Infrastructure - Drivers for Action

The following discussion outlines the drivers for development of physical risk mitigation infrastructure for local governments and the insurance industry.

##### a. Local Government

Local government is responsible for a range of assets and infrastructure including community buildings, local roads, drainage systems and open spaces. These assets and infrastructure, be they existing or yet to be built, service the community, protect communities from the impacts of weather events and support the community's recovery from these events. These assets need protecting; in some cases they can be made more resilient by upgrading materials or building them stronger, and in other cases whole areas require protecting with physical risk mitigation infrastructure like dams and levies.

The economic value of a council's infrastructure assets is substantial. Victorian councils control more than \$102.1 billion in assets and infrastructure, including \$26.5 billion in roads and bridges and \$8.7 billion in drains<sup>1</sup>. These assets and infrastructure are being impacted by climate change, impacts that cannot be understood using historic climate data.

While local governments have varying levels of knowledge about *how* climate change will impact their assets and the services they deliver, they are not well informed about what the *financial impact* of climate change is projected to be.

While some local governments have the expertise to design physical risk mitigation infrastructure and, despite the fact that there is very substantial funding available that would facilitate the construction, local government has limited access to this funding.

The ability to respond to the impacts of climate change on physical risk mitigation infrastructure is very dependent on access to the necessary funding; thus, this paper and initiative to access necessary funding.

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<sup>1</sup> Victorian Auditor-General's Report *Local Government Assets: Asset Management and Compliance May 2019*

# Assets impacted



Most of our Council's \$3.2 billion of assets will be impacted by Climate Change.



Figure 1 City of Port Phillip infrastructure impacted by climate change

The City of Port Phillip reported to the Victorian Greenhouse Alliances conference that most of its \$3.2 billion worth of assets and infrastructure will be impacted by climate change.

City of Port Phillip is working to understand the size of their challenge, but the Council must balance its response with current and future community service expectations, legislative compliance obligations and budgetary constraints such as rates capped to inflation and increasing council costs.

The current costs of asset and infrastructure works can be very high. [Coastal councils in WA's South West](#) undertook research in 2012 that found approximately \$1.2 billion worth of assets were at risk from erosion between Rockingham and Dunsborough. The report found \$1.1 billion of these assets could be saved from future erosion, but this would come at a cost of approximately \$120 million. Although this is still a very large investment, one that would, presumably require more than one funding source, it is still significantly less than the cost of replacing the assets.

Without adequate investment in physical risk mitigation infrastructure, the community well-being and the financial viability of councils will be impacted.

There are now substantial financial, legal, regulatory and political imperatives that underpin the need for Councils to not only proactively reduce the emissions of council operations and but to also manage both council and communities' resilience to climate change.

#### *Imperatives*

**Financial** – Damage associated with more extreme natural hazard events will impact council budgets

**Legal** – The liability issues of climate change are fraught. Council has a legal liability to disclose known risks or risks that they ought to know; it is incumbent on council to take actions to protect the community that are within their capability and capacity.

**Regulatory** – From an insurer's perspective the Australian Securities and Investments Commission (ASIC) and the Australia Prudential Regulation Authority (APRA) are strengthening requirements to disclose Climate Related Financial Disclosures in end of year reporting.

**Political** – "Climate Emergency" is being declared by a growing list of governments globally.

27 Australian local governments together with populations of 2.8 million have declared a climate emergency.

More data on countries and government that have declared is here:

<https://climateemergencydeclaration.org/climate-emergency-declarations-cover-15-million-citizens/>

Another significant driver is the recently updated guidance on how directors, financial report preparers and auditors should disclose climate related risk in financial statements if the risks has a material impact on the organisation and has a qualitative impact on stakeholders. The guidance issued by the Australian Accounting Standards Board and the Auditing and Assurance Standards Board means that auditors will be asking councils how climate related risk has been considered, whether the risk is material and what disclosures have been made.

#### b. Insurance industry

Climate Change represents a major threat to the insurance industry. The likelihood of damage to assets and property from natural hazard events is increasing due to Climate Change. The costs of providing insurance are increasing. Australia represents 2% of the global market for insurance capital, but 8% of the losses (Munich Re, 2018). In this way the cost for insurers to secure the capital required to write premium is increasing. This cost is being passed on to the customer and is a contributing factor to the increasing costs of insurance premiums. Another aspect of increasing premium prices is the rising costs associated with pricing individual risks, such as flood, storm and bushfire.

It is possible that some assets may become so expensive to insure that it is unrealistic to do so. The Australian Competition and Consumer Commission is currently conducting an inquiry into insurance affordability in northern Australia<sup>2</sup>. The ICA submission to this Inquiry has identified addressing affordability as a priority and sees investment in physical risk mitigation infrastructure as an essential and effective way to decrease risk, thereby increasing affordability. The insurance sector would benefit from less damage/loss to insured assets if there was greater investment in physical risk mitigation infrastructure.

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<sup>2</sup> <https://www.accc.gov.au/focus-areas/inquiries-ongoing/northern-australia-insurance-inquiry/first-interim-report>

The Insurance Council of Australia wants to help catalyze investment in physical risk infrastructure and help local government to undertake the necessary planning and decision making to enable this investment.

The ICA has been building adaptation initiatives to help address the impacts of climate change for over a decade; particularly working on

- Customer and community engagement post disaster, aiding recovery and building awareness and understanding of the need for increased resilience and disaster preparedness in an era of climate change;
- Reducing the brittleness of the built environment to climate forced extreme weather events through the Resilience Program;
- Development of Australia's only national level hazard data portal, the [ICA Dataglobe](#), describing the intersection between natural perils and the community;
- Maintenance of insurer's ability to use risk-based pricing for underwriting, sending unambiguous price signals to the community and governments where insurable risks have grown to unacceptable levels, as well as positive price signals where adaptive (mitigation) activities have reduced risks;
- Support to government actors involved in mitigation efforts. Providing risk-based pricing evidence to motivate the funding and delivery of government managed mitigation programs for exposed communities.

### c. Case studies – Successful application of physical risk mitigation infrastructure

The following two case studies provide an example of how investment in physical risk infrastructure results in improved outcomes local government and community:

#### 1. Launceston Levee:

Launceston Levee system was upgraded in 2014 at a cost of \$58M. With Launceston experiencing severe flooding in June 2016, the Bushfire and Natural Hazards CRC conducted a project to review the benefits through avoided impacts of the flood levee mitigation program, against the cost of construction.

Findings show that the upgrading of the levee system, completed in 2014, resulted in avoiding losses of about \$216 million (had the pre-existing levees failed), which is approximately four times the total investment in the new levee system. This investment in building the new levee system was found to be a sound economic decision based on the estimated costs at the time of decision making, alongside improved estimates of benefits from this study. The actual benefits of these mitigation works to the community extend beyond the direct benefits as assessed by the BNHCRC, to the intangible and indirect benefits that have not been included.

It was found that sea level rise scenarios would only have a limited impact on building losses. However, the combined impact of sea level rise and increased rainfall intensity due to climate change on the total losses may be significantly greater and could be further investigated.

The Launceston Levee provides a good example/case study for Victorian Governments and included the following considerations:

- The avoided damage cost to Launceston in the June 2016 floods as a result of the new mitigation works.
- The number of people displaced due to inundation of homes for flood events ranging from the 20 year Annual Recurrence Interval (ARI) up to the Probable Maximum Flood (PMF) and the expected time for them to return before and after the new mitigation works.
- Avoided residential and non-residential building damage for flood events ranging from the 20 year ARI up to the PMF due to the new mitigation works.
- The long-term cost to Launceston from flood hazard prior to the new mitigation works.

- The long term cost to Launceston from flood hazard following the new mitigation works.
- A CBA of the new flood mitigation investment.

The full report can be viewed here: [Launceston flood risk mitigation - June 2016 floods](#)

## 2. Roma Levee:

As at September 2019, Roma in Queensland has now completed two stages of Flood Mitigation Infrastructure work. [An announcement was made by the Queensland Government in September 2019](#). Roma was devastated by the South West Queensland flooding in 2012 with an insured loss of \$137M (normalised to 2017 values). The total cost of mitigation infrastructure was approximately \$30M (Stage 1 was at a cost of approximately \$20M and stage 2 was completed for \$8.3M).

This has resulted in more than 500 Roma properties having their flood risk officially downgraded.

Key aspects of the project include:

- Stage 1 – Cost \$20M
  - Designed to protect against 1 in 1000 yr flood
- Stage 2 – Cost \$8.3M
  - Included funding from the Commonwealth National Insurance Affordability Initiative, Q Gov Building our Regions Fund and Maranoa Regional Council.
- Opened 29<sup>th</sup> March 2019
- An [example project Plan](#):

As a direct result of the reduced risk to Roma properties, insurers have returned to the market.

## 5. Asset Vulnerability Assessment

To enable Councils to accurately assess how climate change will impact assets, SECCCA is proposing the development of a tool that shows geographically how council buildings, drainage and local road assets will be impacted by various natural hazards under different climate scenarios, attributing a vulnerability rating to these assets and identifying adaptation actions that may increase asset resilience.

SECCCA developed this project in response to member councils requesting assistance gathering data to enable more informed decisions about future budget and resourcing needs and to create prioritised, costed asset and service delivery plans. Ensuring assets and service delivery is more resilient to climate change is a key part of future council planning.

Questions that the project is designed to address are as follows:

- how might more extreme weather events and sea level rise impact a particular asset?
- how might council's service delivery be impacted by and have to change, to adapt to future climate extremes?
- how much extra will an asset cost to maintain?
- how much extra can councils expect to pay to respond to damages, make assets resilient or pay for insurance?
- how might Council income streams be impacted by climate change?

## 6. Addressing financial barriers – the availability of Green Capital

Securing the significant funding required by local government to invest in physical risk infrastructure is a key barrier. While state and federal government funding is notoriously difficult to access, there is significant money available in the private sector that could be used to finance physical risk infrastructure projects.

These ‘Green Capital’ investors are currently looking for projects that address the need to reduce the risk of climate change. However, the challenge is to structure the investment so that it is ‘investable’. This includes a large enough project in dollar value and suitable credit ratings for the project developer, such as stable existence and a certain revenue base.

Organizations like the Australia Sustainable Finance Initiative, Climate Bonds Initiative and mainstream banks such as NAB are actively considering how to structure and access climate resilient project opportunities.

## 7. Working regionally

One of the key opportunities for local governments to attract this investment is to collaborate with other municipalities, the State Government and water and catchment authorities in order to create projects that are large enough in scale and value. Regional projects would also address the fact that climate risks do not stop at arbitrary boundaries and would facilitate many physical risk infrastructure projects.

For example, in the case of overland flooding, cross catchment and cross local government approaches to hazard assessment and risk reduction are required.

Councils currently collaborate to address a range of matters. Establishing the governance and processes needed to support this regional collaboration can be undertaken.

## 8. Pathways for Action

Councils are at different stages with regards to their understanding, acceptance, governance and action on climate change.

This pathway is proposed as a means for councils to progress towards addressing physical risks resulting from likely extreme natural hazard events as a result of climate change.

It is envisaged that this pathway will be workshopped and improved by SECCCA Councils and that it will then form the basis of a blueprint for development of physical risk mitigation infrastructure.

1. Understand risks and liabilities by undertaking regional risk assessments and assess individual asset resilience (i.e. Asset Vulnerability Assessments as part of data collection and analysis)
2. Determine an appropriate response (protect, adapt asset, decommission asset) and timing of these actions based on triggers (e.g. number of times asset repaired, number of times asset out of use)
3. If protecting or adapting, determine and prioritise possible engineering responses including cost/benefit of each possible response. Maladaptation needs to be carefully considered at this point
4. Prioritise actions and timing of delivery based on previously determined trigger points
5. Commit to initial actions including project concept design
6. Develop an investment logic map including investment opportunities via finance engineering workshop
7. Detailed design and business case development
8. Secure finance and develop the project
9. Measure and monitor the accessibility of funding, the delivery of projects and the prevention of climate change impacts

## 9. Conclusions and Recommendation

There is a clear opportunity and need for the Insurance industry and all levels of government to:

- Discuss what is needed to facilitate good decision making regarding enabling climate resilience.
- Explore potential sources of funding for physical risk mitigation infrastructure.
- Investigate establishing a national fund/body that could administrate/coordinate funding for projects that reduce climate risk.

SECCCA and the ICA are also planning a workshop to discuss how to develop a pathway (such as the one proposed in section 5 of this report) for local governments to originate physical risk mitigation infrastructure and access private funding for them.

The workshop, to be held in March/April 2020, aims to establish a coalition of local governments that will collaborate to identify regional physical risk mitigation infrastructure projects, seek funding for their development and undertake the projects.

Workshop participants will discuss potential physical risk mitigation infrastructure projects across the SECCCA region, explore issues related to creating a process that will determine projects seeking funding, and issues and constraints associated with funding models

Invited participants will be local government CFOs, finance, asset, risk and sustainability managers, finance sector, insurance industry, climate resilience expertise, relevant state and federal government representatives.

**It is recommended that SECCCA and ICA build a coalition of willing councils to progress the delivery of physical risk mitigation infrastructure in the Victorian South East.**