

# **Governance and legislative issues for critical infrastructure adaptation to climate change**

Case study – Ports

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## Contents

Introduction .....	2
Governance arrangements of Victorian commercial ports .....	5
Legislative framework for ports.....	7
How can government use contracts and other legal and commercial levers to facilitate adaptation in a critical infrastructure environment? .....	14
What regulatory tools can facilitate the adaptation of critical infrastructure to climate change?.....	17
Conclusion.....	23

## Introduction

### Objective of the case study

The purpose of this case study is to explore whether the existing governance and legislative frameworks that apply to Victorian ports facilitate climate change adaptation by the ports. Do the arrangements mandate, encourage or hinder port owners and operators to take measures to adapt to climate change? Answering this question will involve consideration of adaptation legislation – legislative provisions which are focussed on climate change adaptation - and adaptive legislation – provisions which are capable of responding to the effects of climate change but are not necessarily climate change specific.

The case study will extrapolate the learnings for ports to critical infrastructure more broadly to assess whether there are synergies in applying adaptation governance and legislative frameworks across critical infrastructure. The paper will conclude by suggesting how existing frameworks may be maximised to enable adaptation, and.

The case study is based on the need to adapt to the more intense and frequent storm events that climate change will bring to coastal areas, including heavy rainfall, high winds, increased wave action and higher storm surges. The resulting impacts for ports will include “increased run-off and siltation requiring increased dredging; disturbance and distribution of currently entrained heavy metals and other pollutants; increased high wind stoppages under Occupational Health and Safety requirements; delays to berthing and cargo handling; coastal flooding; and required engineering upgrades to wharfs, piers, gantries and other cargo handling equipment”.<sup>1</sup>

Text box 1

#### **Experience of the Port of Melbourne during 2009 heatwave**

Vessel delays were experienced at the Port of Melbourne during the January and February 2009 heatwave in Victoria, due to the slowdown in loading and unloading operations. The movement of heavy machinery on bleeding pavements (patches of stickiness on the surface of the bitumen pavements) caused rutting and heaving, with waves forming on the pavement surface. 72 crane hours were lost in January 2009 compared to a loss of 49.5 hours in January 2010.

Prem Chetri et al, *Bushfire, Heat Wave and Flooding – Case Studies from Australia, Report from the International Panel of the WEATHER project funded by the European Commission's 7<sup>th</sup> framework programme* (March 2012) 21

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<sup>1</sup> Department of Climate Change, *Climate Change Risks to Australia's Coast: A First Pass National Assessment* (2009) 120.

## Importance of ports to the economy and community

The National Ports Strategy identifies ports and related land side logistics chains as ‘critical to the competitiveness of Australian businesses, which rely on them to deliver business inputs and to take exports to the global market’.<sup>2</sup> The National Infrastructure Plan, released in June 2013, calls for every major port in Australia to have a 30 year plan to create ‘greater certainty for ports, local communities and the supply chains that feed into and out of our ports.’<sup>3</sup>

Ports are significant components of the Victorian economy and community and are integral to the operation of the freight and logistics network. The Port of Melbourne is Australia's largest container and general cargo port. It handled approximately \$82 billion in trade in 2011-2012, including a national record of 2.58 million twenty-foot equivalent container units (TEUs).<sup>4</sup> This equates to 37 per cent market share of national container trade.<sup>5</sup>

Significant growth is expected for Victoria’s container trade, with the total task forecast to grow to 11.2 million TEUs by 2046.<sup>6</sup> To meet this demand, several port expansion and development projects are underway in Victoria. The \$1.6 billion Port Capacity Project at the Port of Melbourne involves expanding capacity at the two existing Swanson Dock terminals and construction of a third international container terminal at Webb Dock, which is due to be completed in 2016-17. This project is expected to meet demand at the Port of Melbourne until the mid 2020s.<sup>7</sup> The Port of Hastings is being developed to become Victoria’s next major commercial port, scaled up to service expected demand up to and beyond 2050. It will ultimately provide capacity for 8 to 9 million containers, which is almost double the current container capacity of the Port of Melbourne.<sup>8</sup> Once fully developed, the Port of Hastings will be the largest container port in Australia.<sup>9</sup>

These developments provide opportunities for the impacts of severe weather events to be factored into the projects, particularly the engineering standards of new terminals and plant infrastructure and the maintenance regimes for assets. Procurement and contract documentation can encompass adaptation initiatives.

Port stakeholders include terminal operators, shipping lines, freight and logistics companies, customs brokers, stevedores and trucking companies. Stakeholders whose business operations are based on port land have commercial arrangements with port managers, who are in a

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<sup>2</sup> Infrastructure Australia, *National Ports Strategy: Infrastructure for an economically, socially and environmentally sustainable future* (2011) 5.

<sup>3</sup> Infrastructure Australia, *National Infrastructure Plan* (June 2013) 50.

<sup>4</sup> Victorian Premier and Minister for Ports, Joint Media Release *Naphthine Delivers Major Boost for Port of Hastings*, 3 April 2013.

<sup>5</sup> Victorian Government, *Plan Melbourne: Metropolitan Planning Strategy* (October 2013) 89.

<sup>6</sup> Department of Transport, Planning and Local Infrastructure, *Victoria The Freight State: The Victorian Freight and Logistics Plan* (August 2013) 9.

<sup>7</sup> *Ibid* 28.

<sup>8</sup> Victorian Premier and Minister for Ports, Joint Media Release *Naphthine Delivers Major Boost for Port of Hastings*, 3 April 2013.

<sup>9</sup> Department of Transport, Planning and Local Infrastructure, above n9, 29.

position to include risk management strategies that address climate change into those arrangements.

Port activities are wide-ranging and include:

- Berthing/un-berthing
- Vessel loading/unloading
- Assets maintenance
- Dangerous goods management
- Warehousing
- Storage of bulk goods
- Inter-modal transport movements
- Waste disposal
- Stevedoring<sup>10</sup>
- Food processing (fisheries)
- Bunkering
- Pilotage
- Towage
- Boat repairs and maritime services

Economic costs that may flow to ports from climate change impacts include reduced port productivity as a result of increased downtime, increased capital expenditure to allow for changes in design and protection of port infrastructure, and increased operational expenditure from additional maintenance and repair costs.<sup>11</sup>

### **Roles and responsibilities of government and the private sector**

The Victorian Climate Change Adaptation Plan (the Victorian Adaptation Plan)<sup>12</sup> places responsibility on private sector entities to manage risks to their private assets and activities, on the basis they are best placed to do so.<sup>13</sup> However, it recognizes that interruptions to activities at ports have ‘significant flow-on implications across the state with operations compromised by delays in moving goods which impacts businesses and communities’.<sup>14</sup> To the extent that port functions can therefore be identified as providing a public good, there is a role for government to play as private entities are not exposed to the full costs to society of infrastructure failure – for example, cascading costs incurred by the freight and logistics sectors if ports are not fully operational for a period of time due to extreme weather.

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<sup>10</sup> Stevedoring means ‘the loading or unloading of the cargo of a vessel and incidental activities such as the handling or storage of cargo or stevedoring equipment at the place at which the cargo is loaded or unloaded’ ( *Port Management Act 1995* s3).

<sup>11</sup> Ibid 121.

<sup>12</sup> Victorian Government, *Victorian Climate Change Adaptation Plan* (March 2013).

<sup>13</sup> Victorian Government, above n3, 11.

<sup>14</sup> Ibid, 18.

As outlined in the Victorian Adaptation Plan, the Victorian Government has critical roles and responsibilities to perform to enable adaptation to a changing climate, including managing risks to public sector assets and services managed by the government and supporting private sector adaptation.<sup>15</sup>

The ports sector provides an excellent opportunity for these two roles to be developed, as ports in Victoria have hybrid ownership arrangements, resulting in a mix of privately and publicly owned assets.

The commercial ports of Melbourne, Hastings, Portland and Geelong are examined in this study to enable a comparison of their different governance arrangements and assess whether these facilitate, impede, or are silent about climate change adaptation strategies.

## **Governance arrangements of Victorian commercial ports**

### **Port of Melbourne**

The port of Melbourne handles cargo ranging from timber to cars, and there are specialised berths for dry cargoes including cement, sugar and grain. Other facilities cater for liquids including crude oil and petrochemicals.

The port of Melbourne is currently owned by the Victorian government. The government has recently announced its intention to privatise the port.<sup>16</sup> The port manager<sup>17</sup> is the Port of Melbourne Corporation (PoMC), a statutory authority under s141B of the Transport Integration Act 2010 (TIA). PoMC manages and develops the port of Melbourne, including by providing the infrastructure necessary for the operation of the port. PoMC manages infrastructure, property, plant and equipment assets of \$2.4 billion including channels, port land, buildings and infrastructure assets.<sup>18</sup> PoMC owns and manages 510 hectares of port land and adjacent waterways which are serviced by 34 commercial berths. This includes two international container terminals at Swanson Dock, which handles approximately 35% of Australia's container trade, as well as Australia's largest automotive trade terminal with up to one thousand new motor vehicles handled each day.<sup>19</sup>

PoMC leases and licenses land and port assets to privately owned third parties, who are terminal operators and providers of freight services and ancillary port services. The leases and licences give access to port berths and facilities to private entities.

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<sup>15</sup> Ibid 10.

<sup>16</sup> Michael O'Brien and David Hodgett, 'Coalition Government to Assess Future of Victoria's Ports' (Media Release, 5 March 2014).

<sup>17</sup> A port manager of a commercial trading port is, as defined in the *Port Management Act 1995*, 'the person or body who effectively manages, superintends or controls the operation of the port or part of the port, but does not include a tenant or occupier of part of the port unless the tenant or occupier has entered into a port management agreement to manage the operations of that part of the port' (s3). Port managers are responsible for the operations of the port, port administration, maintenance and harbor control.

<sup>18</sup> TIA s29.

<sup>19</sup> Port of Melbourne Corporation, *Annual Report 2011-2012*, 10.

The international terminal operators are DP World, which operates the container terminal at West Swanson Dock, and Patrick Stevedores, which operates the container terminal at East Swanson Dock, and both have long-term leases with PoMC.

The Victoria-The Freight State plan indicates that the Port of Melbourne is likely to lose market share to the Port of Hastings in the years leading up to 2050 and that beyond that time trades moving through Melbourne may need to be relocated. This will be due to the Port of Melbourne reaching its container handling capacity and constraints on servicing larger container ships.<sup>20</sup>

### **Port of Hastings**

The port of Hastings handles commercial cargo including crude oil, petroleum, LPG and steel products. The port has capacity for bulk liquids and other cargo. The port operates five berths.

The port of Hastings is owned by the Victorian government. The Port of Hastings Development Authority (PoHDA) is a statutory authority established pursuant to s 141Q of the TIA to facilitate development of the port of Hastings to increase capacity and competition in the container ports sector servicing Melbourne and Victoria. Approximately 3,500 hectares of land around the port is zoned for port related uses.

The port of Hastings has two private sector port managers.

PoHDA administers the Port Management Agreement (Port of Hastings) (the Agreement) through which daily operation of the port land is performed by a private company Patrick Port-Hastings, a Division of Asciano Limited. The Agreement enables Patrick to retain responsibility for port operations, including maintaining the condition of the port property and infrastructure assets, until 30 June 2017.<sup>21</sup>The Agreement is not publicly available.

BlueScope Steel is the other private sector manager. It owns, manages and operates the jetties at the steel wharves at the port of Hastings.

The statutory authority Victorian Regional Channels Authority (VRCA) is responsible for regional shipping channels and manages the commercial navigation channels in the port waters of the ports of Hastings, Portland and Geelong ('port waters' are areas designated by Orders made by the Governor in Council).

All the waters of the port of Hastings are managed by Patrick through a channel operating agreement with the VRCA. This agreement is included as a schedule to the main Agreement.<sup>22</sup>

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<sup>20</sup> Department of Transport, Planning and Local Infrastructure, above n9, 30.

<sup>21</sup> Port of Hastings Development Authority, *Annual Report 2012-For the Period 1 January 2012-30 June 2012*, 6.

<sup>22</sup> *Ibid.*

## **Port of Portland**

The port of Portland is a bulk port providing import and export of commodities including grains, forestry products, fertilizers, aluminium products, mineral sands and livestock. Facilities are also provided for the fishing industry. The port comprises five bulk cargo berths.

The port of Portland was privatized in 1996 and the land at the port is privately owned and operated by the Port of Portland Pty Ltd (POPL) with ownership vested in two infrastructure funds, each owning 50%. The first is Utilities Trust of Australia (managed by Hastings Fund Management). The second shareholder is Palisade Ports Pty Ltd, an investment managed by Palisade Investment Partners. POPL is also the port manager.

The port waters are managed by POPL on behalf of the VRCA.

## **Port of Geelong**

The port of Geelong handles 25 per cent of Victoria's export including petroleum products, bulk grain and woodchips. Imported materials include crude oil, petroleum products, hazardous materials and fertilizer raw materials.

The port of Geelong was privatized in 1996 and now the land at the port is owned and operated by two private sector companies, GeelongPort and GrainCorp Ltd, which are also the port managers. GeelongPort manages 15 berths and approximately 90 hectares of port zoned land. GrainCorp's core business is to provide storage, logistics and marketing of grain, seeds and other free flowing bulk commodities including woodchips, minerals, fertilizer and stock feed pellets.

The VRCA is the port manager for the port waters of Geelong.

## **Legislative framework for ports**

There are two overarching pieces of legislation that regulate ports in Victoria - the Port Management Act 1995 (the PMA) and the Transport Integration Act 2010 (the TIA). These are examined to determine the extent to which they facilitate or hinder adaptation to climate change by ports.

### **Transport system objectives**

The PoMC, the PoHDA and the VRCA are 'transport bodies' for the purposes of the TIA<sup>23</sup> and in that capacity are required to have regard to the transport system objectives set out in the TIA when exercising their powers and performing their functions under any transport legislation.<sup>24</sup> The most relevant for this case study are 'economic prosperity',<sup>25</sup>

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<sup>23</sup> TIA, s3.

<sup>24</sup> TIA, s24.

<sup>25</sup> TIA, s9.

‘environmental sustainability’,<sup>26</sup> and ‘efficiency, coordination and reliability’.<sup>27</sup> ‘Economic prosperity’ requires the transport system to facilitate economic prosperity by, amongst other matters, enabling efficient and effective access for goods to markets, fostering competition by providing access to markets and facilitating investment in Victoria. ‘Environmental sustainability’ includes preparing for and adapting to the challenges presented by climate change.<sup>28</sup> The efficiency objective requires the transport system to facilitate network-wide efficient, coordinated and reliable movements of goods at all times.

The objectives reflect a whole-of-government perspective and are relevant to the commercial ports as they constitute crucial components of Victoria’s freight networks. However, the privately owned and operated commercial ports at Portland and Geelong are not required to have regard to the TIA objectives. This means they can operate in a manner to maximise their economic performance, without consideration of the factors embodied in the objectives.

### **General legislative provisions applicable only to government owned ports**

The PoMC and the PoHDA are able to let third parties manage parts of the ports, and provide services for the operation of the ports. Where they do involve other parties, the PoMC and the PoHDA are required to ‘control’ those third parties’ involvement.<sup>29</sup>

The PoMC and the PoHDA are also required to perform any functions in accordance with a Ministerial direction.<sup>30</sup> A direction can be made that the PoMC or the PoHDA perform certain functions in the public interest, but which may cause the PoMC or the PoHDA to suffer financial detriment. The Treasurer is required to approve the direction and PoMC or the PoHDA may be reimbursed an amount determined by the Treasurer.<sup>31</sup> The availability of Ministerial directions is a powerful tool that enables the government to step in and compel a port to take a particular action that it may not otherwise undertake.

### **Applicability of climate change legislation**

There are some Victorian legislative provisions requiring climate change to be considered, but they do not mandate ports to adapt to climate change. As highlighted above, the TIA requires transport bodies to ‘have regard to’ certain objectives when exercising powers and performing functions, including actively contributing to environmental sustainability by preparing for and adapting to climate change challenges. This explicitly recognises the need to adapt to climate change. However, the phrase ‘have regard to’ is vague and difficult to ascertain in the absence of documented consideration of the objectives.

The Climate Change Act 2010 requires decisions made under certain scheduled Acts to ‘have regard to the potential impacts of climate change’<sup>32</sup> but neither the TIA nor the PMA are

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<sup>26</sup> TIA, s10.

<sup>27</sup> TIA, s12.

<sup>28</sup> TIA, s10(e).

<sup>29</sup> TIA, ss141E(1) and 141T(1) respectively.

<sup>30</sup> TIA, ss141(H) and 141(V) respectively.

<sup>31</sup> TIA, ss141(H)(3) and 141V(3) respectively.

<sup>32</sup> *Climate Change Act 2010 (Vic)*, s 14.

scheduled Acts and the phrase ‘have regard to’ is featured again. As the overarching climate change legislation in Victoria, it may be desirable to expand the list of scheduled Acts to broaden the consideration of climate change impacts to the transport and other critical infrastructure sectors. This would involve considering how government and private operators of critical infrastructure could most effectively be required to address climate change adaptation matters. The Victorian Adaptation plan notes that the scope of the decision making requirements of the Climate Change Act will be included in a review of the Act in 2015.<sup>33</sup>

### **Safety and emergency management plans (SEMPs)**

The PMA requires commercial and local port managers to prepare Safety and Emergency Management Plans (SEMPs) for the whole of the port area which the manager controls or manages.<sup>34</sup> This means that SEMPs apply a whole of port approach to improving the safety and environmental performance of all operations within a port precinct. A SEMP is to identify a port’s hazards and risks, their likely impact on the port, and measures and strategies implemented or to be implemented to reduce the risks.<sup>35</sup> One of the objectives of SEMPs is to promote an integrated and systematic approach to risk management in relation to the operation of a port. The Victorian Adaptation Plan identifies SEMPs as a tool utilised by all ports to address risks including risks associated with sea level rise.<sup>36</sup>

SEMPs must be prepared in accordance with Ministerial Guidelines.<sup>37</sup> The current Ministerial Guidelines were issued in November 2012. SEMPs must identify the area or areas of port lands and waters to which they apply. The description must identify all key facilities and infrastructure in the port, highlighting any that are vulnerable to extreme climate events.<sup>38</sup>

The TIA objectives are required to be considered by PoMC, PoHDA and VRCA when they prepare their SEMPs. The objective to actively contribute to environmental sustainability by, amongst other matters, preparing for and adapting to climate change challenges,<sup>39</sup> is pertinent to the SEMPs of these ‘transport bodies’ (but is not applicable to privately owned ports, as discussed above).

The PoMC SEMP 2011-2012 observes that the PoMC’s climate change objectives include maintaining the long term sustainability of the Port of Melbourne by enhancing its capacity to anticipate and adapt to climate change.<sup>40</sup> While there are no further details about adaptation in the SEMP, the PoMC has developed a Climate Change Policy and Climate Change Strategy.

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<sup>33</sup> Victorian Government, above n 3, 11.

<sup>34</sup> PMA, s91C.

<sup>35</sup> PMA, s91D.

<sup>36</sup> Victorian Government, above n3, 55.

<sup>37</sup> PMA, s91D(3).

<sup>38</sup> Victorian Government, *Ministerial Guidelines: Port Safety and Environment Management Plans*, November 2012, 14.

<sup>39</sup> TIA, s10(e).

<sup>40</sup> Port of Melbourne Corporation, *Safety and Environment Management Plan – 2011-2012*, 76.

These are not publicly available. An Executive Summary of the SEMP for Hastings is publicly available, but contains no specific reference to climate change.<sup>41</sup>

Port managers are required to set out in their SEMPs the processes to be followed to involve tenants, licensees and service providers in the implementation of their SEMPs<sup>42</sup> and must then ensure that ‘reasonable steps’ are taken to follow those processes.<sup>43</sup> The requirement to follow the processes is a significant one as the Minister is empowered to issue a direction to a port manager to follow those processes.<sup>44</sup> A financial penalty may be the consequence of non-compliance with such a Ministerial direction.<sup>45</sup>

The Guidelines note that port managers are expected to take reasonable steps to engage with, and influence, within the bounds of their legal and commercial powers, tenants, licensees and service providers to ensure that operations in areas of the port for which those parties have primary control are covered by SEMPs.<sup>46</sup> ‘Reasonable steps’ may include the incorporation of SEMP related requirements into current/new tenancy agreements, ‘common user agreements’, licences and other relevant commercial/access agreements.<sup>47</sup>

Port managers do not have inherent powers to compel businesses operating in their ports to comply with safety and environmental requirements, beyond any rights and powers which flow from their commercial and contractual arrangements. An example of how a port manager engages with third parties at a port can be seen in the Port of Portland draft 2013 SEMP. POPL has implemented a Port User Operating Licence which defines management responsibilities for port tenants, licensees and service providers, including the requirement for a port user to undertake a Job Safety and Environment Analysis, prepare its own SEMP, provide induction training and validate port entry permits for sub-contractors.<sup>48</sup>

The Guidelines require port managers to undertake a comprehensive hazard and risk identification process that identifies the nature and extent of hazards and risks within the port area, including the hazards and risks that could result in an emergency that may be of high consequence.<sup>49</sup> The Guidelines list consideration of the potential effects of extreme climate events during port infrastructure maintenance and upgrades as a possible high level KPI to achieve a port’s SEMP objective and safety and environmental duties.<sup>50</sup>

Where there are multiple port managers at a port, the Guidelines require them to cooperate in the development of their SEMPs, noting that they may prepare separate SEMPs for the port

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<sup>41</sup> Patrick Ports Hastings, *Safety and Environment Management Plan for Port of Hastings: November 2012 Update (Executive Summary)*.

<sup>42</sup> PMA, s91D(1)(f).

<sup>43</sup> PMA, s91C(2)(b).

<sup>44</sup> PMA, s91H(3)(b).

<sup>45</sup> PMA, s91C(3). The penalty applicable to commercial ports is 240 penalty units; worth \$30,000 in the 2012-2013 financial year.

<sup>46</sup> Victorian Government, above n33, 21.

<sup>47</sup> Ibid 22.

<sup>48</sup> Port of Portland, *Draft Safety and Environment Management Plan*, February 2013, 39.

<sup>49</sup> Victorian Government, above n33, 14.

<sup>50</sup> Ibid 13.

areas over which they have individual responsibility, or develop one integrated SEMP.<sup>51</sup> The Guidelines suggest that where there are ports with numerous port managers, tenants, licensees and service providers with varying safety and environmental duties, the SEMP may sit above other port plans or processes that cover statutory requirements. The high level SEMP would then focus on how whole of port management processes work to reduce risks and hazards. Cross-referencing would be used to link to more detailed risk and hazard analysis in plans of individual port managers, tenants, licensees and service providers (where relevant).<sup>52</sup>

SEMPs are required to be audited every three years<sup>53</sup> to assess whether a SEMP addresses all matters required by the PMA, accords with the Guidelines and whether the port manager is complying with the SEMP.<sup>54</sup> Reports of audits are provided to the port managers and the Minister.<sup>55</sup>

### **Policy framework for ports**

At a national level, Infrastructure Australia's National Infrastructure Plan recognises the need to boost the resilience of infrastructure networks to the effects of climate change<sup>56</sup> so that extreme weather conditions do not result in significant social and economic costs.<sup>57</sup>

Infrastructure Australia's National Ports Strategy recommends that documentation regarding all levels of planning for ports should be published and encompass an outlook horizon of a minimum 15-30 years. Documentation should consider external factors, including risks and opportunities, that may impact ports' planning.<sup>58</sup> This implicitly includes the risks and opportunities presented by climate change.

The PMA requires commercial ports to prepare a Port Development Strategy (PDS) at four yearly intervals.<sup>59</sup> Port Development Strategies were prepared by PoMC in 2009,<sup>60</sup> and by the VRCA for the Port of Geelong in 2013.<sup>61</sup> PDSs are required to include trade projections and projected infrastructure requirements for land and water in the port. The PDSs could encompass climate change adaptation pathways but there is no specific mention of adaptation in the current PDSs.

The PoMC and the PoHDA are required to perform their functions consistently with State policies and strategies for the development of Victorian ports and freight networks.<sup>62</sup> They must operate in a 'commercially sound manner' to the extent permitted by the policies and

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<sup>51</sup> Ibid, 8.

<sup>52</sup> Ibid, 12.

<sup>53</sup> PMA, s91F.

<sup>54</sup> PMA, s91E.

<sup>55</sup> PMA, s91FA.

<sup>56</sup> Infrastructure Australia, *National Infrastructure Plan* (June 2013), 11.

<sup>57</sup> Ibid, 77.

<sup>58</sup> Infrastructure Australia, *National Ports Strategy* (2011), 20.

<sup>59</sup> PMA, s 91K.

<sup>60</sup> Port of Melbourne Corporation, *Port Development Strategy: 2035 Vision* (2009).

<sup>61</sup> Victorian Regional Channels Authority, *Port of Geelong-Development Strategy*(2013).

<sup>62</sup> TIA, ss141E(2)(a) and 141T(2) respectively.

strategies.<sup>63</sup> These provisions recognise the importance of overarching government policies setting out the future directions for ports, which could include specific requirements about the resilience of port infrastructure and assets in the face of extreme climate events.

In August 2013 the Victorian Government released *Victoria – The Freight State*, a document that sets out a vision and plan for the future of Victoria’s freight and logistics sector to 2050.<sup>64</sup> Ports are identified as a key element of the sector. The document includes key directions, strategies and actions, but is silent on the issue of climate change. The ports focus in *Victoria – The Freight State* is on the need to have ports and freight infrastructure with the capacity to handle the forecast growth in container movements, rather than consideration of the resilience of the infrastructure.

The draft Victorian Coastal Strategy, released in September 2013, recommends that government ‘monitor risk management strategies adopted by the local and commercial ports for port infrastructure identified as vulnerable to extreme climate events’.<sup>65</sup>

### **Interdependencies of critical infrastructure**

Critical infrastructure interdependencies are significant in the context of adaptation, as they impact resilience. Within a port environment there are interdependencies on other sectors. Ports rely on other transport modes such as road and rail for the movement of goods and to enable staff access. Cycles of drought followed by flood can damage roads and rail track, slowing or halting the movement of goods in and out of ports. Ports also rely on the availability of electricity to power their own operations and to provide services to visiting vessels. Other port interdependencies include ICT for management of services and drainage infrastructure to prevent flooding.

Ports are ‘interaction points’ between transport and logistics stakeholders,<sup>66</sup> underscoring the importance of cooperation and a consistent approach to adaptation by all stakeholders. Ports need to work with the operators of other key infrastructure sectors to ensure there is a coordinated approach to climate change adaptation. There is limited benefit if one operator builds resilience to climate change if its interdependent sectors are not also considering the issues in a collaborative manner. The risk here is of cascading impacts on other sectors – including agriculture, retail and manufacturing. The supply chains and resources that other sectors rely upon can come to a halt if a port cannot operate due to severe weather impacting it directly or indirectly through impacts on other transport or utilities operations.

Critical infrastructure operators can be encouraged by government to share data and collaborate across networks to ensure that the vulnerabilities in one sector do not threaten the resilience of others. A Victorian Managed Insurance Agency (VMIA) forum in 2012

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<sup>63</sup> TIA, ss141E(2)(b) and 141T(2)(b) respectively.

<sup>64</sup> Department of Transport, Planning and Local Government, *Victoria – the Freight State: The Victorian Freight and Logistics Plan* (August 2013).

<sup>65</sup> Victorian Coastal Council, *Draft Victorian Coastal Strategy* (September 2013) 60. The final version is due to be presented to the Minister for Environment and Climate Change in 2014.

<sup>66</sup> A.K.Y. Ng et al, *Climate Change and the Adaptation Strategies of Ports: The Australian Experiences’* Research in Transportation Business and Management (May 2013) 2.

identified that interdependent agencies and industries should build better relationships to understand each others' risks and thereby enhance the resilience of critical infrastructure systems.<sup>67</sup>

There are existing critical infrastructure Security and Continuity Networks (SCNs) and the Trusted Information Sharing Network (TISN), auspiced by the Victorian government. The PoMC and Port of Geelong are members of the SCN for Roads, Ports and Freight. These types of networks may provide opportunities for infrastructure operators to engage with government on issues concerning climate change, to facilitate support for adaptation measures.

### **Current adaptation measures by ports**

It is outside the scope of this paper to assess the level of current awareness of climate change risks by individual Victorian ports. No commercial ports have publicly available documents that address climate change risks and adaptation in depth.

However, it is worth noting that a recent report based on workshops with representatives from the Australian ports industry,<sup>68</sup> identified that ports in Victoria (and Tasmania) have undertaken significant work to assess operational issues such as ship navigation in higher winds and the effect on physical port infrastructure of storm events and corrosion.<sup>69</sup> The report found that less adaptation work has been performed to address issues associated with sea level rises, siltation and heat damage of port infrastructure.<sup>70</sup> The report states that workshop participants cited examples of existing initiatives as evidence of ongoing adaptive capacity, including specifications for a new berth at Geelong which has taken into account 'more periods of windy days, increased wind strength, and higher bollard pull'.<sup>71</sup>

Another recent study examined climate change issues with the Gladstone Ports Corporation, Sydney Port Corporation and Port Kembla Corporation.<sup>72</sup> That study found that

resilience to current day climate variability is evident within the immediate port environment (at the level of individual organisations). This can be attributed to autonomous adaptation primarily as a result of a combination of regulatory and operational mechanisms such as OH&S requirements, risk management strategies, and incremental changes to practice brought about by the ports experience of weather-related events.<sup>73</sup>

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<sup>67</sup> VMIA, *Risk Insight: A Resilience Approach: The VMIA Critical Infrastructure Risk Management Roundtable Approach* (May 2012) 4-5.

<sup>68</sup> Melissa Nursey-Bray et al, 'Vulnerabilities and Adaptation of Ports to Climate Change' *Journal of Environmental Planning and Management* vol 56, issue 7 (September 2013) 1021-1045.

<sup>69</sup> Ibid 1034.

<sup>70</sup> Ibid.

<sup>71</sup> Ibid 1035.

<sup>72</sup> Darryn McEvoy and Jane Mullett, *Enhancing the Resilience of Seaports to a Changing Climate: Research Synthesis and Implications for Policy and Practice* (Enhancing the Resilience of Seaports to a Changing Climate Report Series, National Climate Change Adaptation Research Facility) (2013).

<sup>73</sup> Ibid, 39.

These reports indicate that different ports are at different stages of considering the potential impacts of extreme weather events and developing specific adaptation strategies.

## **How can government use contracts and other legal and commercial levers to facilitate adaptation in a critical infrastructure environment?**

The Commonwealth notes that it is:

*essential to consider the impacts of climate change now to avoid locking in ineffective and inappropriate infrastructure and policies. The Commonwealth has a key interest in ensuring the owners of nationally significant infrastructure (such as ports ... ) provide continued and uninterrupted functioning of these assets, which are critical to supporting our national economy.*<sup>74</sup>

The mix of government and privately owned commercial ports in Victoria presents challenges as they operate under governance and legislative regimes which, whilst there are some commonalities, also have points of difference. Privately owned ports have a commercial focus while government owned ports have a broader public focus. The focus on returning a profit to shareholders will become predominant as the trend to privatise critical infrastructure continues. Given the public good function of ports – and critical infrastructure generally - government should consider how it may engage private owners so they do not underinvest in adaptation measures for infrastructure. The challenge is to mainstream adaptation across critical infrastructure sectors so that it is fully integrated into business planning, risk management systems and operational programs.

### **Government levers**

Government can address these issues by providing policy and regulatory frameworks that are conducive to adaptation initiatives and support appropriate risk management allocation. While primary responsibility for critical infrastructure resilience resides with infrastructure owners, there is an expectation that government will take appropriate measures to ensure that owners and/or operators manage their risks and that vital service delivery is not interrupted, as recognised in the Victorian government’s Critical Infrastructure Resilience Interim Strategy.<sup>75</sup>

Government can influence the incorporation of adaptation principles and requirements into a range of tools, including:

- new infrastructure project plans;
- funding agreements;
- output specifications,

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<sup>74</sup> Department of Climate Change, *Adapting to Climate Change in Australia: An Australian Government Position Paper* (2010) 12.

<sup>75</sup> Victorian Government, *Critical Infrastructure Resilience Interim Strategy* (December 2013) 1.

- standards;
- asset management plans;
- price review processes for essential services;
- decision making guidance;
- legislation;
- resilience planning.<sup>76</sup>

It is important that governance arrangements optimise the construction and maintenance of critical infrastructure to bolster resilience. Government can model leading risk management practices by embedding climate change considerations into the risk management and business continuity arrangements of publicly owned infrastructure. There could be a requirement or incentive for the owners and operators of port infrastructure to make significant investments in purchasing and maintaining assets. Incentives are unlikely to be placed in legislation but government can mandate the inclusion of adaptation requirements into commercial and contractual arrangements when investing in or procuring new infrastructure projects, including ports. For example, incentives may be reflected in the length and terms of contracts/leases and agreements.

The maintenance requirements in contractual documents need to be very specific, while not encouraging ‘gold-plating’ maintenance standards which will increase charges imposed by ports on their customers with no demonstrated value in return. Inter-generational equity issues need to be considered so that while gold-plating is to be avoided, so too is delaying action for future generations to contend with. Competitive tension between ports can also act as an incentive to ensure high maintenance standards. A commercial port that is not resilient in the event of a severe storm risks reputational damage and the loss of business to other ports.

Text box 2

In October 2011 the UK Department for Transport tabled the Ports National Policy Statement in Parliament. National Policy Statements (NPS) are part of reforms to the planning system for major infrastructure introduced by the *Planning Act 2008*. Section 10(3)(a) of this Act requires the Secretary of State to have regard to the desirability of mitigating and adapting to, climate change in designating a NPS.

Applicants to develop new port infrastructure are required under the Ports NPS to consider the impacts of climate change when planning the location, design, build and operation of a new port, given the fact that ports are long term investments which will need to operate over many decades. Applicants must use the latest set of UK Climate Projections to ensure they have identified appropriate adaptation measures.

*UK Department for Transport, National Policy Statement for Ports, October 2011*

<sup>76</sup> HM Government, *The National Adaptation Programme: Making the Country Resilient to a Changing Climate* (July 2013) 38-9.

Government has a role in providing climate risk information to the private sector to help drive adaptation measures, as recognised in the Victorian Adaptation Plan.<sup>77</sup> Commonwealth government agencies including the CSIRO and the Bureau of Meteorology provide detailed climate projection information. At a state level, in 2012 the Victorian government issued new Victorian Coastal Inundation Maps and Dataset to provide information for the whole of the state's coastline on the potential for flooding from sea level rise and storm tides.<sup>78</sup> Private organisations need data to make decisions about the risks that climate change may pose to their businesses. The specific risks need to be identified so that appropriate adaptation strategies can be developed. The cost of compiling climate projections is too costly to be undertaken by most businesses. An advantage of government providing information is that consistent data sets and information are collated and distributed statewide.

### **Private sector drivers for adaptation**

Private sector led approaches to adaptation measures can be risk based and business led approaches, both driven by competitive interests. The privately owned ports are commercial entities operating to maximise their economic performance, and that is the perspective that will lead them to embed climate change awareness and adaptation into their operations and risk management plans and business practices. Increasingly frequent and extreme weather events should focus the attention of port owners and operators on the resilience of their infrastructure.

Port owners and operators can:

- embed adaptation throughout the organisation's decision making;
- integrate adaptation into maintenance regimes for existing assets;
- consider how climate change impacts may affect new infrastructure and implement adaptation measures accordingly;
- consider how operational procedures may be affected;
- consider impacts on supply chains.

Owners and operators can drive the incorporation of climate change adaptation strategies into hazard and risk management profiles across the port areas for which they are responsible, within the bounds of their legal and commercial powers. However, the consent of third parties is required if new or updated requirements are sought to be added to agreements.

### **Role of investors and insurers**

Investors and insurers bear risks from economic losses of infrastructure operators and can promote climate resilience by requiring infrastructure owners to consider the impacts of climate change on their existing or proposed assets and demonstrating how adaptation will be factored into the location, design, build and operation and/or maintenance of assets. Climate change and adaptation risks and opportunities can be integrated into investors' investment analysis and decision making processes. Investors can demand greater disclosure of climate

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<sup>77</sup> Victorian Government, *Victorian Climate Change Adaptation Plan* (March 2013) 32.

<sup>78</sup> *Ibid* 51.

risks and adaptation actions by companies to increase awareness, understanding and action. Investors can incorporate within their own due diligence processes an assessment of vulnerability to climate change and how this is planned to be addressed over an asset's proposed lifetime.

Climate issues are one of many risk factors that need to be considered by port operators. Non-climate drivers likely to impact ports include transaction costs, increased competition and contestability, future international markets, future trade forecasts (for example, agricultural produce depends on factors affecting patterns of production, which itself will be impacted by climate changes), capacity issues, technological developments, domestic demand and location and level of population growth. The consideration of climate change impacts within existing risk management practices "would strengthen existing resilience, with adaptation measures integrated as part and parcel of normal investment cycles or maintenance regimes".<sup>79</sup>

### **What regulatory tools can facilitate the adaptation of critical infrastructure to climate change?**

A regulatory framework that facilitates climate change adaptation may include a mix of tools that can respond to the level of risk that extreme weather poses to different types of infrastructure. Risk will vary depending on:

- the type, age, design and location of infrastructure;
- the impact and consequences of climate events on the infrastructure and associated services;
- the likelihood of the different climate events occurring; and
- the resilience and behaviour of people and systems in responding to climate change.<sup>80</sup>

A risk assessment is necessary to identify climate specific risks that apply to infrastructure. Regulatory tools can then be chosen that are commensurate with the identified risks.

Maddocks has identified the following elements as useful in enabling effective adaptation to climate change:

- Explicit or implicit recognition of the need to account for climate change;
- Broad objectives;
- Flexibility in regulatory approach, tools and decision-making process;
- Responsibility for decision-making is vested in the entity that is best placed and resourced to identify, assess and respond to risks;
- Decision-making processes are informed by relevant and up-to-date information;
- Compliance is practical and least cost;
- Effective enforcement mechanisms exist.<sup>81</sup>

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<sup>79</sup> McEvoy and Mullett, above n 69, 6.

<sup>80</sup> Maddocks, *The Role of Regulation in Facilitating or Constraining Adaptation to Climate Change for Australian Infrastructure: Report for the Department of Climate Change and Energy Efficiency* (2011) 45.

Conversely, regulatory elements that may hinder adaptation include:

- Failure to recognise environmental considerations, including the effects of climate change;
- Rigid, prescriptive rules that do not respond to evolving risks;
- Inconsistent application, leading to different approaches and outcomes;
- Inadequate access to information in decision-making processes;
- Compliance is difficult;
- Enforcement mechanisms are inadequate.<sup>82</sup>

These elements may be considered in the design of regulatory tools, including legislation, operation and management plans, codes of practice, standards, contracts and licensing arrangements. These tools are not mutually exclusive and multiple tools may apply simultaneously, depending on the circumstances. Regulatory tools may be developed from scratch, or may build upon existing schemes which address other risks to ports or critical infrastructure. It is important when designing a suite of regulatory tools to ensure they operate in a complementary manner, to promote a consistent approach to climate change adaptation.

## Legislation

Legislation can enable assessment of climate change risks and the development of adaptation strategies, either explicitly, or by being broad enough to encompass consideration of climate change issues. The Victorian Terrorism (Community Protection) Act 2003 is an example of legislation that focuses on a single risk factor – terrorism – and could be used as a model to require owners of ports and other critical infrastructure to include assessments of climate change risks in their general risk profiles, and require adaptation plans to be developed following the assessments.

Part 6 of the Terrorism (Community Protection) Act 2003 mandates operators of certain Victorian essential services<sup>83</sup> to prepare risk management plans to mitigate the specific risk of terrorist acts.<sup>84</sup> These plans can be incorporated into general risk management plans for the organisation.<sup>85</sup> The plans are required to be audited annually and updated.<sup>86</sup> Annual training exercises are conducted<sup>87</sup> to test the rigour of the plans and these are scenario based. Any similar legislative scheme focussing on climate change risks could require adaptation plans to be audited and updated on a regular basis. Legislation could include a requirement that infrastructure operators participate in exercises with their stakeholders and clients to

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<sup>81</sup> Ibid, 44.

<sup>82</sup> Ibid.

<sup>83</sup> The *Terrorism (Community Protection Act)* applies to essential services that are subject to a declaration by the Governor in Council.

<sup>84</sup> *Terrorism (Community Protection Act) 2003*, s29(1).

<sup>85</sup> *Terrorism (Community Protection Act) 2003*, s29(3).

<sup>86</sup> *Terrorism (Community Protection Act) 2003*, s32.

<sup>87</sup> *Terrorism (Community Protection Act) 2003*, s33.

workshop possible scenarios where extreme weather events affect the ability of the infrastructure to meet its operational requirements.

As the Terrorism (Community Protection) Act 2003 focuses on one risk to infrastructure, it will be impacted by the shift in approach to emergency management in Victoria to an ‘all hazards approach’, as outlined in A Roadmap for Victorian Critical Infrastructure Resilience<sup>88</sup> and the subsequent Critical Infrastructure Resilience Interim Strategy.<sup>89</sup>

The Strategy establishes a risk-based Victorian Critical Infrastructure Model under which the criticality of infrastructure will be assessed, pending the passage of proposed emergency management legislation in 2014. Under the Model, owners of critical infrastructure assessed as ‘vital’ will be legislatively compelled to comply with specified risk management requirements. Owners of critical infrastructure assessed as ‘major’ or ‘significant’ will be encouraged to develop best practice standards based on the mandatory requirements for vital infrastructure.

It is proposed in the Strategy that government departments will custom design assessment methodologies to assess the criticality of Victorian critical infrastructure in their sector. The methodology will consider all hazards and a range of risks consistent with AS/NZS ISO31000 Risk Management-Principles and Guidelines. It will also involve consideration of the vulnerabilities, upstream and downstream dependencies as well as the resilience of critical infrastructure.<sup>90</sup>

This approach would enable climate change impacts to be considered within a broader range of risk factors. Ports are critical infrastructure and their security and emergency management operations focus on preventing and responding to emergencies, which may result from any one, or combination of, multiple sources of hazard. Climate change is one hazard. The Strategy foreshadows that legislation will be enacted in 2014 to focus the attention of owners and operators of critical infrastructure on an all hazards approach to emergency management. This approach will include a focus on the interconnectedness and interdependencies of infrastructure, which increases the risk of wider consequences. An all hazards approach will enable climate change to be considered as one of many potential hazards.

By way of contrast, text box 3 illustrates how climate change specific legislation in the UK requires transparent reporting of climate risks and adaptation strategies by critical infrastructure operators. The report prepared by a ports operator is discussed, noting the significant outcome that the operators’ climate risks have been embedded across its risk assessment processes and business continuity plans.

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<sup>88</sup> Victorian Government, *A Roadmap for Victorian Critical Infrastructure Resilience* (December 2012).

<sup>89</sup> Victorian Government, *Critical Infrastructure Resilience Interim Strategy* (December 2013).

<sup>90</sup> *Ibid* 13.

Text box 3

**UK Climate Change Act 2008.**

The Secretary of State is empowered (s62) to issue directions to 'reporting authorities' (bodies with functions of a public nature) to prepare a report which may do any or all of the following:

- assess the impact of climate change on its functions,
- detail policies and proposals to adapt to climate change,
- assess progress against previous reports.

Reports are publicly available which encourages transparency and enables assessments to be analysed to develop best practice procedures for adaptation.

An example is the report prepared by Associated British Ports in 2011 in response to a s62 Direction. ABP is a private company which owns and operates 21 ports in the UK, making it the UK's largest ports operator. ABP risk assessed each of its harbour functions against a series of climate change risks. ABP used a range of climate change projections and assumptions data when conducting its risk assessments.

Using these projections, ABP selected several climate change risks for more detailed analysis under its existing internal risk management appraisal mechanism. ABP conducts an annual review of internal controls and risk management systems, including environmental and climate change risk.

The majority of risks identified were of a low risk rating. Sea level rise and flooding is a medium risk to ABP's engineering and Vessel Traffic Services (VTS)(damage to assets and interruption of services). Storminess is a medium risk to the same functions (damage to assets and access routes, requiring more maintenance activities and may have reduced windows to repair/maintain). Increased temperatures is a medium risk to VTS (impact on working conditions of staff). More extreme weather may result in reduced operational hours.

ABP intends to use the report findings to inform its ongoing risk assessment processes and business continuity plans.

*Associated British ports, Climate Change Adaptation Report: Humber, Hull, Immingham and Southampton Harbour Authorities, 2011*

## **Operation and management plans**

Operation and management plans can be required to incorporate climate change issues. As an example, the 2012 Ministerial Guidelines for the SEMP scheme require port managers to identify facilities and infrastructure in the port that are vulnerable to extreme climate events. These Guidelines could be strengthened to require port managers to also outline adaptation measures to be taken to address those vulnerabilities and risks. SEMPs could be a strong tool to facilitate climate change adaptation as they are a legally mandated instrument that require an integrated and coordinated plan across the whole of a port area. SEMPs are ‘living’ documents that are to be updated following auditor’s recommendations, so they provide a flexible tool that can be responsive to changing circumstances.

SEMPs are a high level document but the focus on coordination cascades down into documents and plans of operators and tenants in a port. For example, Port User Operating licences are a tool that can be used to encourage environmental awareness and responsibility for personnel operating on port land.

## **Codes of practice and standards**

Codes of practice and standards offer another useful tool for adaptation to climate change, and can be prescriptive or performance based. Codes and standards are not mandatory unless incorporated by reference in legislation. For example, declared essential service operators in Victoria are required to comply with certain standards and guidelines when preparing risk management plans with the objective of mitigating the risk of terrorist acts.<sup>91</sup> The obligation to prepare the risk management plans resides with the operators.

A new Australian Standard was released in June 2013 to specifically assist in the management of climate change risks for infrastructure, based on the International Standard ISO 31000: 2009 Risk Management – Principles and Guidelines. The new standard, AS 5334-2013 Climate Change Adaptation for Settlements and Infrastructure – A Risk Based Approach, can be applied by ports and other critical infrastructure owners in their risk management assessments and plans. The standard includes a climate change exposure and infrastructure sensitivity matrix, which includes infrastructure sectors, and discusses ports within the transport component.<sup>92</sup>

## **Contracts and licensing arrangements**

Contracts are a legal mechanism to assign risk between contracting parties. In the context of climate change, risk may be allocated for a range of matters including:

- identifying risk factors for critical infrastructure components,
- undertaking risk assessments,

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<sup>91</sup> *Terrorism (Community Protection) Act 2003*, s 29, and *Terrorism (Community Protection)(Prescribed Standards) Regulations 2007*, reg 3.

<sup>92</sup> Standards Australia, *AS 5334-2013 Climate Change Adaptation for Settlements and Infrastructure – A Risk Based Approach* (2013), Tables A1, A2 and A3, 43-8.

- preparing and updating adaptation plans, and
- building and maintaining assets to a standard designed to withstand types of extreme weather events.

Risk is costed in contracts. If government enters a contract whereby the contractor is allocated the greatest share of the project risk, the cost to government will be greater than if the government shares the risk equally or bears the greatest burden itself. It is therefore important for government to enter contracts concerning critical infrastructure with a considered understanding of the potential impacts of climate change, so that the risk is allocated, and therefore the costs structured, in a manner commensurate with the scope, scale and climate vulnerabilities of the project.

Contracts to design, construct, build and operate key port infrastructure, and other critical infrastructure, need to address climate change adaptation needs, to ensure the resilience of the assets. Contracts should address the particular climate change risks that have been identified for a particular infrastructure sector through risk assessments, responding as necessary to short, medium and long term risks that may apply to the infrastructure. Fitness for purpose obligations can be incorporated within procurement contracts to stipulate that infrastructure be designed and built to withstand current and future climate change risks.

Contracts may incorporate the new standard Climate Change Adaptation for Settlements and Infrastructure – A Risk Based Approach, as a risk management tool to identify climate change risks for particular infrastructure, and determine appropriate adaptation measures. The standard provides a framework that can be applied in the context of the commissioning, design, planning, approval, construction, maintenance, management, operation and decommissioning of infrastructure. Standards Australia intends to release a range of guides to provide more specific information and guidance for particular infrastructure sectors.<sup>93</sup>

Existing and new infrastructure need contractual provisions that ensure that maintenance regimes incorporate resilience to the impacts of climate change over an asset's lifetime. An amendment to the terms of the Port Management Agreement (Port of Hastings) negotiated in 2012 requires Patrick to undertake a comprehensive maintenance program to ensure that port assets are maintained to prolong their useful life beyond the period of the Agreement.<sup>94</sup>

GeelongPort notes that when tenant agreements, leases, licences or other form of agreements to operate in or gain access to areas of the port are entered into, negotiated or reviewed, GeelongPort, GrainCorp and VRCA, with the consent of the tenant, licensee, customer or service provider, will endeavour to incorporate the appropriate safety and environmental management planning requirements.<sup>95</sup> Similarly, Patrick Ports Hastings encourages all businesses operating in the port of Hastings area to maintain safety and environment

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<sup>93</sup> Ibid, 2.

<sup>94</sup> Port of Hastings Development Authority, above n18, 5.

<sup>95</sup> Patrick Ports, GrainCorp and Victorian Regional Channels Authority, *GeelongPort Safety and Environment Management Plan 2012 – Executive Summary* (August 2012 Update), 11.

management systems and incorporates this requirement into lease arrangements with tenants, licensees and customers.<sup>96</sup>

These types of arrangements may be utilised to implement and monitor climate change adaptation strategies. A stronger option would be to make licences conditional upon adequate assessment and management of climate change risks. However, the consent of a third party is required if new or updated requirements are sought to be added to existing agreements. The most effective time to incorporate climate change adaptation requirements will therefore be when a new commercial agreement is entered into, when the port manager is in a strong negotiating position. Monitoring and enforcement mechanisms should exist to ensure the robustness of these approaches.

## Conclusion

It is clear that the direction for Victorian ports, particularly the Port of Melbourne and the Port of Hastings, as outlined in *Victoria: The Freight State and Plan Melbourne: Metropolitan Planning Strategy*, is to develop significant growth across the sector and enhance the freight and logistics industry in Victoria. The important role of ports is recognised in a range of Commonwealth and Victorian policies and strategies, as highlighted above.

This paper has demonstrated that the criticality of ports to the economy warrants consideration of all risks to the sector and the development of plans to respond to those risks. Climate change needs to be considered in risk profiles of ports, and other critical infrastructure, and adaptation plans developed and implemented commensurate to the level of risk posed by climate change factors.

Adaptability to climate change is an important factor to be considered in current and future port expansion and development projects. If it is not embedded into ports' business, operational and risk management frameworks, the risk is that extreme weather may threaten the ability of ports to operate at their optimum level. They may be exposed to short and/or medium term shut-downs to deal with damaged infrastructure and roads, with cascading impacts on freight and logistics networks.

The mix of government and privately owned commercial ports in Victoria creates some challenges as not all legislative provisions apply to both types of ownership models. While there are currently limited legislative requirements for government owned ports to consider climate change, through the TIA objectives, there are other mechanisms which can be leveraged by government to facilitate climate change adaptation by both government and privately owned ports. These include SEMP, and the Ministerial Guidelines which govern them, which currently make several references to extreme climate events. In particular, the discussion in the Ministerial Guidelines about hazard and risk identification can, and should, be interpreted to include climate risks in port areas.

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<sup>96</sup> Patrick Port Hastings, above n 36, iv.

Given the ‘public good’ functions of ports, there is a role for government to engage with private owners and operators to ensure that ‘big picture’ government strategies and objectives can be achieved. This includes ensuring that comprehensive risk analysis is undertaken by all ports, both government and privately owned, and ensuring that operators address issues of interdependencies. The Victorian Adaptation Plan recognises this need to embed climate change considerations into risk management and business planning for assets and critical service delivery across government portfolios.<sup>97</sup> The Victorian Government Risk Management Framework<sup>98</sup> (the Framework) is applied by government agencies to apply a common risk management standard as part of their business practices. Climate change is listed as one of many categories of risk in the Framework.<sup>99</sup> As the Framework is designed for compliance by government agencies it does not apply to private entities unless it is incorporated by reference in contractual arrangements.

The Auditor-General has recently reported on the implementation of the Framework and found that

Victoria is vulnerable to the impacts of interagency and statewide risks and especially those risks where the full force and significance of the consequences are expected to materialise in the medium to long-term – five years or more from today. The state is not well prepared to effectively manage these risks because it does not have a framework and established practices for understanding and effectively responding to them.<sup>100</sup>

The Auditor-General concludes that the Framework needs to be strengthened to enable public sector agencies to embed effective risk management practices ‘throughout and between’ their organisations.<sup>101</sup> As climate change is a statewide risk, the Auditor-General’s report and findings that such risks are not currently well managed by the current Framework lends weight to an argument that climate change as a specific category of risk, warrants particular attention across government. As discussed above, strategies to achieve this may include strengthening legislation requiring active and ongoing consideration of potential impacts and adaptation measures.

Government can shape the commercial agreements that it enters into with private entities, including infrastructure contracts, licensing and funding arrangements, and through these legal tools may incorporate terms that deal specifically with climate change risks and adaptation measures. These may include the incorporation of standards like the new AS 5334-2013 Climate Change Adaptation for Settlements and Infrastructure – A Risk Based Approach. In turn, those instruments may be drafted to require port managers (or other critical infrastructure owners and operators) to include particular types of risk and climate change focussed provisions into their own commercial arrangements with third parties. In

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<sup>97</sup> Victorian Government, above n 3, 10.

<sup>98</sup> Department of Treasury and Finance, *Victorian Government Risk Management Framework*, March 2011.

<sup>99</sup> *Ibid* 25.

<sup>100</sup> Victorian Auditor-General, *Implementation of the Government Risk Management Framework*, October 2013, 30.

<sup>101</sup> *Ibid* 8.

this manner, government can influence the approach to climate change adaptation across the whole of port areas.

Taken together, existing legislation, risk management and operational policies and practices may be sufficient to facilitate adaptation within the Victorian commercial port sector as they provide a regulatory framework within which climate change adaptation can be considered in a flexible manner. Regardless, the lack of an explicit legislative requirement for ports, or indeed any category of critical infrastructure, to consider the potential impacts of climate change on their operations may warrant further examination. The inclusion of explicit references to climate change within general risk and emergency management legislative frameworks, or within legislation specific to ports or other critical infrastructure, may assist to mainstream adaptation across infrastructure sectors.