

PLANNING FOR ADAPTATION TO CLIMATE CHANGE: LANDMARK CASES FROM AUSTRALIA

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INTRODUCTION

With all attention fixed on the post-Kyoto negotiations for new greenhouse emissions targets it can be easy to overlook actions in the area of climate change adaptation. Indeed, adaptation is often regarded by environmentalists as an excuse for inaction on climate change that could exacerbate adverse environmental impacts.¹ While leading scientific bodies, like the Intergovernmental Panel on Climate Change (“IPCC”), agree on the urgent need for intervention to slow emissions in order to avoid “dangerous climate change,” research also confirms that some degree of climate change is inescapable.² Working alongside mitigation efforts, measures to adapt to the resulting environmental modifications are thus “both urgent and imperative.”³

Within many countries the momentum to adapt to climate change is growing. Australia is a prominent example in this regard, with the importance of adaptation efforts heightened by scientific reports predicting severe impacts on Australia’s many coastal cities with sea level rise.⁴ This article reviews two recent, landmark cases in Australia which show how the courts have supported adaptation to climate change through their interpretation of planning laws. These cases also reveal the scope for the international principles of sustainable development to be translated into legal measures that seek to better prepare coastal communities for the advent of climate change and its environmental impacts.

THE ADAPTATION IMPERATIVE

Australia, like the continental United States, occupies a vast area of territory covered by a diverse range of ecological systems. To some extent, the impact of climate change on this environment is discernible already: Australia has experienced major droughts, extreme water shortages, and faces widespread biodiversity loss.⁵ In the future, additional threats are likely to be posed to coastal cities and towns that face problems of erosion, ocean surge, increased storm severity, and flooding if sea levels rise significantly.⁶ In its latest assessment, the IPCC advises

that “[s]ea level rise under warming is inevitable” and will “continue for many centuries after [greenhouse] concentrations have stabilized.”⁷

Countries and regions with significant stretches of coastline and low-lying lands—such as Australia, the river delta areas of Southeast Asia, and the Indian subcontinent, as well as many parts of the United States—are very vulnerable to the effects of climate change-induced sea level rise.⁸ Although future warming and its likely effects may be reduced if an effective agreement on deep emissions cuts emerges from the current post-Kyoto negotiation process,⁹ it is becoming increasingly clear that climate change impacts cannot be entirely prevented. In this context, climate change mitigation, in the sense of “implementing policies to reduce [greenhouse gas] emissions and enhance sinks,” will not be sufficient to avert serious environmental damage. Instead

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there is a need for adaptation “initiatives and measures to reduce the vulnerability of natural and human systems against actual or expected climate change effects.”¹⁰

The potential for residential and other coastal development to be adversely affected by climate change has important ramifications for the associated responsibilities of planning authorities, which act as “the stewards of the coast.”¹¹ In Australia, planning is primarily the responsibility of state governments pursuant to state planning laws and policies, although decision-making on approvals for individual projects is generally delegated to local governments.¹² State governments may become directly involved

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in the environmental assessment and approval of development proposals, as may the federal government in the case of major projects (e.g. a large-scale coastal residential development)¹³ and/or ones with a likelihood of significant environmental impact.¹⁴ State governments also have responsibility for coastal management and planning under various pieces of legislation.¹⁵

Over the longer-term, if planning authorities in coastal regions ignore the imperative of adapting to climate change they may face the risk of civil liability for developments approved without adequate regard for future impacts like flooding or land erosion.¹⁶ One leading Australian commentator describes the threat of litigation against local governments in such circumstances as “increasingly more real.”¹⁷ Indeed, local governments may be particularly vulnerable to litigation brought by property owners affected by climate change as these bodies will generally be easier to identify and link to the harm suffered than the entities whose pollution contributed to particular impacts.¹⁸ In light of this, “the only sensible strategy for local governments is to start incorporating climate change considerations into a wide range of their decisions and activities.”¹⁹

CLIMATE CHANGE ADAPTATION AND PLANNING LAW

Compared with greenhouse emissions mitigation that tends to be a focus of national and international regulation, climate change adaptation is a topic naturally suited to consideration at a more local level. For a start, the benefits of adaptation measures tend to be quite localized (e.g. construction of a sea wall or levee to reduce coastal erosion at a given beach with rising sea levels). In addition, high levels of variability in the manifestation of impacts across different areas, even within the same country or region, militate in favor of tailored, local responses. As a consequence, local and state governments have been at the forefront of climate change adaptation in Australia,²⁰ as well as in other jurisdictions.²¹ In turn, local decision-making and policy development with respect to climate change adaptation are beginning to generate institutional and organizational change outside the government sector amongst development agencies, property developers, financiers, and insurers.

At the level of local government in Australia, many municipal councils around the country have introduced, or are in the process of formulating, planning measures and development conditions designed to ensure adaptation to climate change impacts. These planning measures target a range of potential impacts, from rising sea levels and increased coastal erosion, to a greater frequency of cyclones and bushfires.²² Such measures may limit, quite substantially in some cases, the capacity of property owners to develop their land as they wish.

For instance, the Redland Shire Council operating on the northeast coast of Australia in the State of Queensland has included a provision in its Strategic Plan that makes the “consideration of sea level changes which may result from changes in

climatic conditions” a relevant decision-making factor for proposed urban development.²³ On this basis, the Council has imposed conditions on new developments restricting the areas of land that can be built on to those above a one in one hundred year flood level.²⁴ Similar development control provisions are appearing in some areas of the United States. An example is the Coastal Sand Dune Rules issued under the Maine Natural

Resources Protection Act, which require an anticipated sea level rise of two feet in the next one hundred years to be considered in determining size, density, and location restrictions for proposed development.²⁵ Some planning authorities have contemplated more drastic measures to adapt to climate change-induced sea level rise such as instituting a policy of planned retreat where human settlements are relocated away from the coastline.²⁶ Bryon Shire Council on the central eastern coast of Australia is one such local government that is implementing a policy of this kind with mixed results.²⁷

Unsurprisingly, local adaptation measures that restrict development in the coastal zone have not gone unchallenged. In Australia, this has resulted in a number of cases coming before planning and environmental tribunals and courts.²⁸ These cases have necessitated judicial consideration (at varying levels of detail) of the risks of sea level rise with climate change and the legal scope for adaptation measures to respond to such risks. The decisions contribute to a growing body of climate change jurisprudence in Australia dealing with the permissible nature of global warming mitigation and adaptation strategies taken at the local, state, or national level.²⁹

CLIMATE CHANGE ADAPTATION LITIGATION

Two recent landmark decisions of Australian courts illustrate the way in which litigation through the planning system is shaping actions to respond to the challenge of impending climate change. The two cases originated in different coastal areas of Australia: the New South Wales south coast (the *Walker* case) and the low-lying South Gippsland coast in the State of Victoria (the *Gippsland Coastal Board* case). Consequently, different local government and state laws were applicable in each case. Yet, an interesting link between the decisions is their shared reliance on the principles of sustainable development to interpret planning laws in a way that supports the implementation of adaptation measures.

In Australia, the internationally-derived concept of sustainable development (known as ecologically sustainable

development or “ESD”) is a central policy goal of planning and environmental law requiring the integration of environmental considerations into development-related decision-making.³⁰ It is embodied in the objectives of multiple statutes spanning all Australian jurisdictions.³¹ ESD is generally underpinned in such legislation by a series of environmental principles whose function is to guide the development of specific environmental rules and to provide a framework for making individual decisions that balance environmental and development considerations. Important principles of ESD in Australia (that mirror international sustainable development principles)³² include the principle of inter-generational equity (requiring regard to be had to the environmental needs and interests of future generations) and the precautionary principle (advising caution in the face of scientific uncertainty over potential environmental impacts).³³ ESD and its principles thus provide a common framework for environmental law and decision-making in Australia, superimposed over the requirements of specific, local legal and policy requirements.

WALKER CASE

The *Walker* case was a judicial review action in which a challenge was brought to approval of a concept plan for a residential subdivision and retirement village.³⁴ The proposed development was located at Sandon Point, near Wollongong on the coast just south of Sydney.³⁵ The Sandon Point proposal attracted strong public opposition on the basis of its potential environmental impacts, including effects on three watercourses crossing the site that were prone to flooding.³⁶

Approval powers for the development had been transferred from the local authority to the New South Wales Planning Minister under state legislation following the designation of the proposal as a “major infrastructure project.”³⁷ The relevant legislation was the *Environmental Planning and Assessment Act 1979* (“EPA Act”), which under Part 3A, makes special provision for the assessment of projects designated as major infrastructure. Pursuant to Part 3A of the EPA Act, in approving the concept plan the Minister was obliged to take into account an environmental assessment prepared by his department. In turn this assessment was required to identify any relevant aspect of “the public interest,”³⁸ a category which has been judicially interpreted to encompass the principles of ESD such as inter-generational equity and the precautionary principle.³⁹ Accordingly, one of the principal grounds for review in the *Walker* case was that the Planning Minister had failed to take into account principles of ESD in making his decision.⁴⁰ The factual basis for this claim was the absence of any consideration by the Minister or his department of the potential for the flooding risk on the Sandon Point site to be exacerbated by climate change.⁴¹

Justice Biscoe of the New South Wales Land and Environment Court began by considering whether, under Part 3A of the EPA Act, ESD principles were a mandatory consideration in decision-making and, if so, whether the Minister was bound to consider the relevance of climate change flood risk to the development.⁴² The answers to these questions turned on construction

of the subject matter, scope, and purpose of the EPA Act. The court noted that the objects of the Act included the encouragement of ESD as well as protection of the environment, “defined broadly and non-exhaustively in s[ection] 4(1) to include ‘all aspects of the surroundings of humans, whether affecting any human as an individual or in his or her social groupings.’”⁴³ Moreover, Justice Biscoe held:

There may be found in the subject matter, scope and purpose of this legislative scheme, as with nearly every statute conferring power to make an administrative decision, an implication that the decision is to be made on the basis of the most current material available to the decision-maker which has a direct bearing on the justice of the decision So too, in my opinion, with the deadly serious issue of climate change, which has loomed ever larger in the public and political eye for years.⁴⁴

In the context of the project at issue, the court found that climate change flood risk could be described as “an aspect of the public interest that potentially has a direct bearing on the justice of the decision.”⁴⁵ In Justice Biscoe’s view, therefore, climate change flood risk was appropriately designated as a necessary consideration for environmental assessment of a flood-constrained, coastal plan development like that under review. Flowing from the objective of encouraging ESD in the objects of the EPA Act, the consideration of climate change flood risk thus became a relevant, mandatory consideration for the Minister in deciding whether to approve the concept plan. His failure to do so rendered that approval void and of no effect.⁴⁶

The importance of the *Walker* decision in the context of the adaptation imperative for climate change is twofold. First, the case illustrates how general principles of environmental law, such as principles of (ecologically) sustainable development, can be employed as a framework for importing specific considerations pertinent to climate change risks into decision-making. The court’s reliance on ESD principles—rather than particular legislative or policy directives—as a basis for finding climate change flood risk to be a mandatory consideration in the case may have far-reaching ramifications “for all kinds of economic activities.”⁴⁷ The reasoning employed in the *Walker* judgment may be applicable to many types of development potentially impacted by climate change. This might include developments that are affected by increased drought risk, decreased snowfall, coral bleaching, or coastal erosion.

The second major contribution made by the case is the way it highlights how local development assessment and approvals must increasingly be made in terms of a holistic and global context that includes global warming risks. As Justice Biscoe stated:

Climate change presents a risk to the survival of the human race and other species. Consequently, it is a deadly serious issue. It has been increasingly under public scrutiny for some years. No doubt that is because of global scientific support for the existence and risks of climate change and its anthropogenic causes.⁴⁸

Such judicial statements point to an acceptance of a global scale for risk assessment when it comes to considering the potential impacts of climate change, even though the focus remains on local measures for adaptation. This view is precipitating a change in thinking on the part of developers and planning authorities in coastal regions. For instance, following the *Walker* decision, one Australian law firm advised that in relation to future project applications:

[I]t is recommended that proponents and councils make an assumption that there is the potential for greater flooding or inundation than is presently the case (i.e. due to climate change), and that proponents should consider whether any mitigation measures can be designed to alleviate any future flooding impacts.⁴⁹

GIPPSLAND COASTAL BOARD CASE

The wide-ranging consequences of the *Walker* case were echoed in another Australian climate change flooding case decided in 2008, although in this instance it was sea level rise rather than extreme weather events that were the cause for concern. The *Gippsland Coastal Board* case⁵⁰ has been regarded as a watershed decision in relation to coastal development adaptation and climate change. In its decision, which was based on a reappraisal of all the relevant scientific and planning evidence,⁵¹ the Victorian Civil and Administrative Tribunal determined to refuse consent for residential developments in a low-lying coastal region.⁵²

The local South Gippsland Shire Council had previously approved permits for six residential developments in the Grip Road area of Toora, an area zoned for agricultural and mixed land uses.⁵³ The grant of permits was opposed by the Gippsland Coastal Board, a regional coastal board set up under the Victorian *Coastal Management Act 1995*.⁵⁴ In its application to the Victorian Civil and Administrative Tribunal for merits review of the approvals, one of the principal objections raised by the Gippsland Coastal Board was that the proposed dwelling developments were inappropriate in light of projected sea level rises as a result of climate change.⁵⁵ In elaborating this argument, the Board relied on preliminary studies of potential sea level rise and wind surge undertaken by Australia's premier scientific research organization, the Commonwealth Scientific and Industrial Research Organisation.⁵⁶

The Tribunal ultimately determined to refuse approvals for the proposed development based on inconsistency with zoning and planning controls.⁵⁷ Importantly also, the Tribunal applied the precautionary principle as a component of ESD to find that development consent should not be granted in view of the likelihood of inundation of the land and proposed dwellings, due to sea level rise induced by climate change.⁵⁸

In the circumstances of the *Gippsland Coastal Board* decision, there were no specific provisions in the relevant planning laws mandating either consideration of the precautionary principle or the potential for sea level rise. However, the Tribunal noted the general scientific consensus "that some level of climate change will result in extreme weather conditions beyond the historical record that planners and others rely on in assessing future potential impacts."⁵⁹ According to the Tribunal there thus existed "a reasonably foreseeable risk of inundation" to the land and proposed dwellings that was judged to be unacceptable.⁶⁰ This threat was considered an adequate basis for invocation of the precautionary principle notwithstanding the Tribunal's acceptance that there was a degree of scientific uncertainty as to the level of projected sea rise on the Gippsland coast. Indeed, the Tribunal endorsed a precautionary approach on the issue of climate change adaptation while clearly acknowledging that "[t]he range of impacts may well be beyond the predictive capability of current assessment techniques."⁶¹ The Tribunal also emphasized that for effective risk assessment, it was not acceptable to rely upon historical data and previous flood model predictions in assessing future climate change induced risks.⁶²

Like the *Walker* case before it, the *Gippsland Coastal Board* decision illustrates the broad potential for ESD concepts to be relied upon in fashioning planning approaches for climate change adaptation. In particular, adoption of a precautionary approach to evaluating the effects of potential sea level rise signals an important development where the limits of existing risk assessment and predictive capability are clearly acknowledged.⁶³ The Tribunal's reasoning suggests that the necessity for precautionary action in coastal planning and decision-making flows from the general scientific consensus regarding the likelihood of inundation from rising seas as this risk is now one which is "reasonably foreseeable." In this regard, one consequence of the *Gippsland Coastal Board* decision may be the routine inclusion of climate change considerations via the importation of ESD principles in decision-making and merits review under planning and environment legislation across relevant Australian jurisdictions.

There is also the specter of litigation facing those governmental authorities that act without regard to future climate change risks.

CONCLUSION

Cases like the *Walker* and *Gippsland Coastal Board* decisions are still few and far between and the imperative for climate change adaptation planning and development has certainly not been accepted by all governments and planning authorities in Australia. Clear tensions remain between pressures for development approval in coastal regions and the need to adapt to climate change impacts through state and local planning regimes. Nevertheless, the currency of global warming issues and the firming

of scientific data on future impacts are encouraging many local governments and coastal planning authorities in Australia and elsewhere in the world to give serious thought to planning for and implementing precautionary measures to respond to expected effects like sea level rise and inundation. As climate change considerations come to be seen as relevant, if not essential, to environmental assessment processes, there is also the specter of litigation facing those governmental authorities that act without regard to future climate change risks.⁶⁴

The emerging trend evidenced in the Australian cases of *Walker* and *Gippsland Coastal Board* to consider climate change risks within the broader ambit of sustainable development could also have far-reaching significance. In Australia, as in many other jurisdictions, the policy and principles of sustainable development play an overarching, strategic role in planning and environmental laws. The Australian cases illustrate how general concepts of sustainability can be translated into specific requirements for planning and decision-making in areas at risk from the effects of climate change. The precautionary principle, in

particular, appears well-suited as a basis for measures to ensure coastal development adapts to climate change over the longer-term, at least in circumstances where there is clear supporting scientific evidence at the general level of climate change risks such as flooding or sea level rise.⁶⁵ Therefore, despite the well-acknowledged limitations of sustainable development as a guiding objective for environmental law,⁶⁶ it seems the concept may progressively be given real purchase in a practical way through its implementation in the evolving climate law jurisprudence.

The Australian cases on adaptation also illustrate the multiple scales relevant for actions to address climate change. Both the *Walker* case and the *Gippsland Coastal Board* case see climate change as a global problem but one that poses risks at the local as well as the global level. Although the focus of countries and many in the environmental community will remain (rightly) on preventing dangerous global warming, the law is also beginning to embrace a role for local adaptation measures to prepare for climate change effects. This gives new meaning to the old environmental adage “think globally, act locally.” 

Endnotes: Planning for Adaptation to Climate Change

Reference note: All Australian cases are available at <http://www.austlii.edu.au>.

¹ See Matthew D. Zinn, *Adapting to Climate Change: Environmental Law in a Warmer World*, 34 *ECOLOGY L. Q.* 61, 64 (2007).

² INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (IPCC), *CLIMATE CHANGE 2007 SYNTHESIS REPORT: SUMMARY FOR POLICY-MAKERS 19-20* (2007).

³ See Janet McDonald, *The Adaptation Imperative: Managing the Legal Risks of Climate Change Impacts*, in *CLIMATE LAW IN AUSTRALIA* 124, 124 (Tim Bonyhady & Peter Christoff eds., 2007); see also Daniel A. Farber, *Adapting to Climate Change: Who Should Pay?*, 23 *J. LAND USE & ENVTL. L.* 1 (2007).

⁴ See, e.g., B.L. PRESTON & R.N. JONES, COMMONWEALTH SCIENTIFIC & INDUS. RESEARCH ORG., *CLIMATE CHANGE IMPACTS ON AUSTRALIA AND THE BENEFITS OF EARLY ACTION TO REDUCE GLOBAL GREENHOUSE GAS EMISSIONS 22* (2006), available at <http://csiro.au/files/files/p6fy.pdf> (last visited Feb. 15, 2009).

⁵ See generally R.J.S. BEETON ET AL. (2006 AUSTRALIAN STATE OF THE ENV'T. COMM.), *AUSTRALIAN STATE OF THE ENV'T 2006*, available at <http://www.environment.gov.au/soe/2006/publications/report/index.html>.

⁶ See Zinn, *supra* note 1, at 67-81 (noting that similar problems face coastal regions in the United States).

⁷ INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *supra* note 2, at 20.

⁸ See generally Kelley M. Jancaitis, *Florida on the Coast of Climate Change: Responding to Rising Seas* 31 *ENVIRONS ENVTL. L. & POL'Y J.* 157 (noting that Florida is a case in point in the United States).

⁹ AUSTRALIAN GOV'T, DEP'T OF CLIMATE CHANGE, *WHITE PAPER ON CARBON POLLUTION REDUCTION SCHEME: AUSTRALIA'S LOW POLLUTION FUTURE 21* (2008), available at <http://www.climatechange.gov.au/whitepaper/foreword.html> (finding the Australian government is pessimistic on the prospects for international negotiations to achieve a comprehensive global agreement to stabilize greenhouse gas emissions at safe levels).

¹⁰ See INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE *FOURTH ASSESSMENT REPORT, WORKING GROUP III REPORT, ANNEX I* (Aviel Verbruggen ed., 2007), available at <http://www.ipcc.ch/pdf/assessment-report/ar4/wg3/ar4-wg3-annex1.pdf> (outlining the definitions of mitigation and adaptation as drawn from the work of the IPCC).

¹¹ See Meg Caldwell & Craig Holt Segall, *No Day at the Beach: Sea Level Rise, Ecosystem Loss, and Public Access along the California Coast*, 34 *ECOLOGY L. Q.* 533, 535 (2007).

¹² Australian local governments are similar to municipal governments in the United States. They are not mentioned in the Australian Constitution but are established and given powers pursuant to state laws.

¹³ See, e.g., Environmental Planning and Assessment Act, 1979, No. 203, pt. 3A (N.S.W.) [hereinafter EPA] available at <http://www.legislation.nsw.gov.au/viewtop/inforce/act+203+1979+FIRST+0+N>; see also Environmental Effects Act, 1978, No. 9135 (Vict.), available at <http://www.legislation.vic.gov.au/> (select “Victorian Law Today” hyperlink, select “acts” and click E, scroll down to Environmental Effects Act of 1978).

¹⁴ See, e.g., Environment Protection and Biodiversity Conservation Act, 1999 (Austl.), available at <http://www.environment.gov.au/epbc/index.html> (providing that federal involvement is limited to projects with likely significant impacts on designated “matters of national environmental significance,” e.g. endangered species or World Heritage properties).

¹⁵ See, e.g., Coastal Management Act, 1995 (Vict.) (establishing regional coastal boards, such as the Gippsland Coastal Board, discussed in the case note below).

¹⁶ See McDonald, *supra* note 3, at 134.

¹⁷ See Philippa England, *Heating Up: Climate Change Law and the Evolving Responsibilities of Local Government*, 13 *LOC. GOV'T L. J.* 209, 210 (2008).

¹⁸ See McDonald, *supra* note 3, at 134.

¹⁹ England, *supra* note 17, at 210.

²⁰ See, e.g., Australian Gov't, Dep't of the Env't, *Cities for Climate Protection (“CCP”) Australia*, available at <http://www.environment.gov.au/settlements/local/ccp/> (noting local governments played a prominent role in the CCP Australia program, part of the ICLEI Local Governments for Sustainability: <http://www.iclei.org>).

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³² *Id.* at 30.

³³ See CITY OF KEENE, *supra* note 17, at 30.

³⁴ *Id.* at 31-42.

³⁵ *Id.* at 32-42.

³⁶ E-mail from Mikaela Engert, City Planner, City of Keene New Hampshire (on file with author).

³⁷ SNOVER ET AL., *supra* note 7.

³⁸ *Id.* at 28-31.

³⁹ *Id.* at 33-45.

⁴⁰ *Id.* at 47-54.

⁴¹ *Id.* at 55-63.

⁴² SNOVER ET AL., *supra* note 7, at 65-66.

⁴³ *Id.* at 67-86.

⁴⁴ *Id.* at 87-91.

⁴⁵ *Id.* at 93-108.

⁴⁶ *Id.* at 109-11.

⁴⁷ SNOVER ET AL., *supra* note 7, at 112 -19.

⁴⁸ For example, on February 17, 2009, New York City released projections of the impacts of climate change in New York City to inform the City's initiative to plan for adaptation. See NEW YORK CITY PANEL ON CLIMATE CHANGE, CLIMATE RISK INFORMATION (2009), available at http://www.nyc.gov/html/om/pdf/2009/NPCC_CRI.pdf (last visited Feb. 20, 2009). The Climate Change Advisory Task Force of Miami Dade County, working as a CRC community on adaptation, released its *Second Report and Initial Recommendations* in April 2008. CLIMATE CHANGE ADVISORY TASK FORCE OF MIAMI DADE COUNTY, SECOND REPORT AND INITIAL RECOMMENDATIONS (2008), available at http://www.miamidade.gov/derm/library/08-10-04_CCATF_BCC_Package.pdf (last visited Feb. 20, 2009). Climate change planning at the state level is also increasingly including adaptation measures. See, e.g., Florida's Energy and Climate Change Action Plan, Chapter 8, available at http://www.dep.state.fl.us/climatechange/actionplan_08.htm (last visited Feb. 20, 2009).

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² Southern Nevada Water Authority, Apportionment, http://www.snwa.com/html/wr_colrvr_apportion.html (last visited Feb. 24, 2009).

³ Tim Richardson, *Nevada Falls to No. 8 in Population Growth*, LAS VEGAS SUN, Dec. 22, 2008, available at <http://www.lasvegassun.com/news/2008/dec/22/nevada-falls-no-8-population-growth/> (last visited Feb. 27, 2009).

⁴ Zack O'Malley Greenburg, *America's Emptiest Cities*, FORBES, Feb. 12, 2009, available at http://www.forbes.com/2009/02/12/cities-ten-top-lifestyle-real-estate_0212_cities.html (last visited Feb. 27, 2009).

⁵ Sean Whaley, *State's Growth Projected to Continue*, LAS VEGAS REV.-J., Oct. 7, 2008, available at <http://www.lvrj.com/news/30557039.html> (last visited Feb. 27, 2009).

⁶ *Lake Mead*, *supra* note 1.

⁷ See, e.g., Lieberman-Warner Climate Security Act of 2007, § 2191, 110th Cong. (2d Sess. 2007), Global Warming Pollution Reduction Act, § 309, 110th Cong. (1st Sess. 2007), Safe Climate Act of 2007, H.R. 1590, 110th Cong. (1st Sess. 2007).

⁸ *But see* California Global Warming Solutions Act Assem. B. 32, ("AB32"), Ch. 488, (Cal. 2006) (laying out the notable exception to the dearth of climate change legislation in the American Southwest).

⁹ ARIZONA CLIMATE CHANGE ADVISORY GROUP, CLIMATE CHANGE ACTION PLAN (2006), available at <http://www.azclimatechange.gov/download/O40F9347.pdf> (last visited Feb. 28, 2009).

¹⁰ Arizona Climate Action Initiative, Arizona Initiatives, <http://www.azclimatechange.gov/initiatives/index.html> (last visited Feb. 24, 2009).

¹¹ NEVADA CLIMATE CHANGE ADVISORY COMMITTEE, REPORT TO GOVERNOR GIBBONS 63 (2008), available at <http://gov.state.nv.us/Climate/FinalReport/ClimateChangeReport.pdf> (last visited Feb. 27, 2009).

¹² Western Climate Initiative, <http://www.westernclimateinitiative.org/> (last visited Feb. 17, 2009).

¹³ Western Governors' Association Working Groups, Climate Change, <http://www.westgov.org/wga/initiatives/climate/index.htm> (last visited Feb. 17, 2009).

¹⁴ NEV. REV. STAT. § 701B (2007), NEV. REV. STAT. § 540 (2007).

¹⁵ Phoebe Sweet, *Desalination Gets a Serious Look*, LAS VEGAS SUN, Mar. 21, 2008, available at <http://www.lasvegassun.com/news/2008/mar/21/desalination-gets-serious-look/> (last visited Feb. 27, 2009).

¹⁶ Henry Brean, *Mulroy Advice for Obama: Tap Mississippi Floodwaters*, LAS VEGAS REV.-J., Jan. 12, 2009, available at <http://www.lvrj.com/news/37431714.html> (last visited Feb. 27, 2009).

¹⁷ *Id.*

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²¹ See generally Caldwell & Segall, *supra* note 11 (highlighting Californian climate change planning and adaptation measures).

²² See Janet McDonald, *A Risky Climate for Decision-making: The Liability of Development Authorities for Climate Change Impacts*, 24 ENVTL. & PLANNING L. J. 205, 407-10 (2007) (outlining Queensland policies and measures). See also Jancaitis, *supra* note 8, at 186-94 (detailing similar state measures being adopted in the United States to adapt to potential sea level rise).

²³ Redland Shire Council, Strategic Plan, 1998, 4.4.3, available at <http://www.redland.qld.gov.au/Planning/Planning/Pages/default.aspx> (click "past planning instruments" then click "1998 strategic plan"). See Parliament of Austl., Inquiry into Climate Change and Env'tl. Impacts on Coastal Communities (2008), available at <http://www.aph.gov.au/house/committee/ccwea/coastalzone/index.htm> (A May 2008 Federal Parliament Committee Inquiry into climate change impacts on coastal communities looked the relevant strategic planning framework).

²⁴ See *Charles & Howard Pty Ltd. v. Redland Shire Council* (2007) (unreported) Queensl. C. A. 200, available at <http://www.austlii.edu.au> (noting conditions were subsequently upheld by the Queensland courts and there is now a strong trend to reconsider and tighten the 1 in 100 year flood measure as this was the standard engineering design pre-climate change).

²⁵ ME. REV. STAT. ANN. tit. 38 § 489D (2000); see also ME. REV. STAT. ANN. tit. 38 § 480-AA.

²⁶ See Jancaitis, *supra* note 8, at 191-94.

²⁷ See McDonald, *supra* note 3, at 131-34 (arguing that the Bryon Shire Council's policy of planned retreat shifts the adaptation burden onto the landowner but without conferring any right to undertake private adaptation measures. In the author's view this "strikes the wrong balance between cautious planning and property rights.").

²⁸ The two principal cases to date are reviewed below. Climate change adaptation has also been mentioned in other cases. *See, e.g.*, 14 Regent Street Pty Ltd. v. Hobart City Council (2004) Tas. Res. Mgmt. & Planning Tribunal 212 available at <http://www.austlii.edu.au>; *see also* Hain v Glen Eira (2006) (unreported) Vict. Civil & Admin. Tribunal (“VCAT”) 2493, available at <http://www.austlii.edu.au>; and Northcape Properties Pty Ltd. v. Dist. Council of Yorke Peninsula (2008) (unreported) S. Austl. Sup. Ct. 57.

²⁹ *See generally* England, *supra* note 17; *see also* Jacqueline Peel, *The Role of Climate Change Litigation in Australia’s Response to Global Warming*, 24 ENVTL. & PLANNING L. J. 90 (2007).

³⁰ *See generally* Australian Gov’t, Dep’t of the Env’t, National Strategy for Ecologically Sustainable Development (NSES) [hereinafter *NSES*], available at <http://www.environment.gov.au/esd/national/nsesd/index.html>.

³¹ Paul L. Stein, *Are Decision-Makers Too Cautious with the Precautionary Principle?*, 17 ENVTL. & PLANNING L. J. 3 (2000).

³² *See* Philippe Sands & Jacqueline Peel, *Environmental Protection in the Twenty-First Century: Sustainable Development and International Law*, in *THE GLOBAL ENVIRONMENT: INSTITUTIONS, LAW, AND POLICY* 43 (Regina S. Axelrod et al. eds., CQ Press 2d ed. 2005) (summarizing international legal principles of sustainable development).

³³ *See generally* NSES, *supra* note 30.

³⁴ Walker v. Minister for Planning (2007) 157 Local Gov’t & Envtl. Reports of Austl. (“LGERA”) 124.

³⁵ *See Walker*, 157 LGERA at 133.

³⁶ *See, e.g.*, ENVTL. DEFENDER’S OFFICE N.S.W., FAILURE TO CONSIDER THE IMPACTS OF CLIMATE CHANGE [hereinafter *DEFENDER*], available at http://www.edo.org.au/edonsw/site/pdf/casesum/sandon_point_casenote.pdf.

³⁷ *EPA*, *supra* note 13, § 75M.

³⁸ *Id.* at cl. 8B.

³⁹ *See Gray v. Minister for Planning* (2006) 152 LGERA 258, 298.

⁴⁰ *See Walker*, 157 LGERA at 132.

⁴¹ *See id.*

⁴² *See id.* at 148.

⁴³ *See id.* 139-40.

⁴⁴ *See id.* at 129.

⁴⁵ *See id.*

⁴⁶ *See Walker*, 157 LGERA at 129.

⁴⁷ *See DEFENDER*, *supra* note 36.

⁴⁸ *See Walker*, 157 LGERA at 191.

⁴⁹ *See* Anthony Whealy & Isabella Ferguson, *Walker v Minister for Planning — implications coastal and flood liable land and major project development*, N.S.W. PLANNING, ENV’T & GOV’T UPDATE (Gadens Lawyers), Dec. 2007.

⁵⁰ *See Gippsland Coastal Bd. v S. Gippsland Shire Council* (2008) (unreported) VCAT 1545.

⁵¹ *See* ADMIN. REVIEW COUNCIL (AUSTL.), REPORT TO THE MINISTER FOR JUSTICE, BETTER DECISIONS: REVIEW OF COMMONWEALTH MERITS REVIEW TRIBUNALS, REPORT NO. 39, PARLIAMENTARY PAPER, 15-16 (1995) (noting the Tribunal’s decision involved merits review, not judicial review. In merits review, tribunals are able to “stand in the shoes” of the original decision maker and consider if the original decision was “correct or preferable”).

⁵² *See Gippsland Coastal Bd.*, (unreported) VCAT cl. 5.

⁵³ *See generally* SOUTH GIPPSLAND SHIRE COUNCIL, AGENDA, NOV. 21, 2007, available at <http://www.southgippsland.vic.gov.au/files/211107Sectionc6.pdf>.

⁵⁴ *See id.* at 130.

⁵⁵ *See Gippsland Coastal Bd.*, (unreported) VCAT cls. 32-33.

⁵⁶ *See id.*

⁵⁷ *See id.* at cl. 21.

⁵⁸ *See id.* at cl. 48.

⁵⁹ *See id.* at cl. 40.

⁶⁰ *See id.* at cls. 45 & 48.

⁶¹ *See Gippsland Coastal Bd.*, (unreported) VCAT cl. 42.

⁶² *See generally Gippsland Coastal Bd.*, (unreported) VCAT.

⁶³ *See id.* at Summ.

⁶⁴ *See McDonald*, *supra* note 22, at 406-407.

⁶⁵ *But see* Telstra v. Hornsby Shire Council (2006) 146 LGERA 10 (imposing a stringent standard for application of the principle based on demonstration of a scientifically verifiable risk. *Gippsland Coastal Board* suggests this standard may be eased in climate change cases where there is strong scientific support at a general level, although this often cannot be translated to exact local regions).

⁶⁶ *See e.g.* ENVIRONMENTAL LAW FOR SUSTAINABILITY (Benjamin Richardson & Stepan Wood eds., Hart Publishing 2006).

ENDNOTES: DIRTY FUEL INCENTIVES IN THE BAILOUT BILL *continued from page 42*

³ *Id.*

⁴ *Id.*

⁵ *Id.*

⁶ *Id.*

⁷ *Id.*

⁸ *Id.*

⁹ LENNY BERNSTEIN ET AL., INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2007: SYNTHESIS REPORT 26, 45 (2007), available at http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf (last visited Feb. 28, 2009).

¹⁰ *Id.* at 37.

¹¹ *See id.* at 30 (explaining that eleven of the past twelve years rank among the twelve warmest years in instrumental record).

¹² *See id.* (indicating that heat waves and heavy rainfalls have become more common).

¹³ Environmental Protection Agency, Basic Information: Climate Change, <http://www.epa.gov/climatechange/basicinfo.html> (last visited February 27, 2009).

¹⁴ *See* BERNSTEIN, *supra* note 9, at 56 (giving adaptation and reduction of greenhouse gases as the two solutions to climate change).

¹⁵ Natural Resources Defense Council, Repower America with Clean Energy: Don’t Choose Dirty Fuels Such As Tar Sands, Oil Shale or Liquid Coal, <http://www.nrdc.org/energy/dirtyfuels.pdf> (last visited February 27, 2009).

¹⁶ Toman et al., *Unconventional Fossil-Based Fuels: Economic and Environmental Trade-Offs*, 2008 RAND i, xiii, available at http://www.rand.org/pubs/technical_reports/2008/RAND_TR580.pdf (last visited Feb. 28, 2009).

¹⁷ Natural Resources Defense Council, *supra* note 15.

¹⁸ Toman, *supra* note 16, at 27.

¹⁹ *Id.* at 44.

²⁰ *Id.* at 23.

²¹ *See* 26 U.S.C. § 48B, amended by H.R. 1424, 110th Cong. (2d Sess. 2008) (raising the amount of creditable investment to \$350 million, plus \$250 million for gasification projects that include equipment for separating and sequestering at least 75% of the project’s total carbon dioxide emissions).

²² *See* 26 U.S.C. § 179C, amended by H.R. 1424, 110th Cong. (2d Sess. 2008) (providing a tax deduction of up to fifty percent of the cost of facilities refining tar sands or oil shale into transportation fuel).

²³ *See* 26 U.S.C. § 6426, amended by H.R. 1424, 110th Cong. (2d Sess. 2008) (extending the alternative fuel credit to coal-based fuels produced at a gasification facility that separates and sequesters a certain percentage of carbon dioxide emissions).



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