

Executive summary

The **National Water Initiative (NWI)** is a joint commitment by Australia's governments to make the nation's water use more efficient and sustainable, leading to greater certainty for investors, producers, communities and the environment. It is Australia's blueprint for managing the nation's water. Each state and territory has an implementation plan to bring the NWI into force.

The **National Water Commission (NWC)**, established under the *National Water Commission Act 2004*, advises the Council of Australian Governments (COAG) and the Australian Government on national water issues and, every two years, reports formally on the progress of the NWI.

The **2009 Biennial Assessment** is the Commission's second two-yearly assessment of progress in the implementation of the NWI. It focuses on developments since the 2007 Biennial Assessment.

The assessment is also a contribution to the public debate on water reform, which has become much wider in recent years as a result of drought, climate change, and the urgent need to manage the nation's water resources more efficiently and sustainably, particularly in the Murray–Darling Basin.

This report—*Australian water reform 2009: Second biennial assessment of progress in implementation of the National Water Initiative*, by the National Water Commission—records significant achievements in water reform across Australia. It covers all states and territories, groundwater and surface water systems, and urban and rural areas. Because the Commonwealth now has a much greater role in water management, the assessment also considers how much the actions of the Australian Government have helped to achieve the objectives of the National Water Initiative (NWI).

In many areas, progress in the past two years has been good, but the Commission has identified some areas where reform has been slow or inadequate. Based on its findings, the Commission has made 68 recommendations for further action to refocus national reform efforts over the next two years.

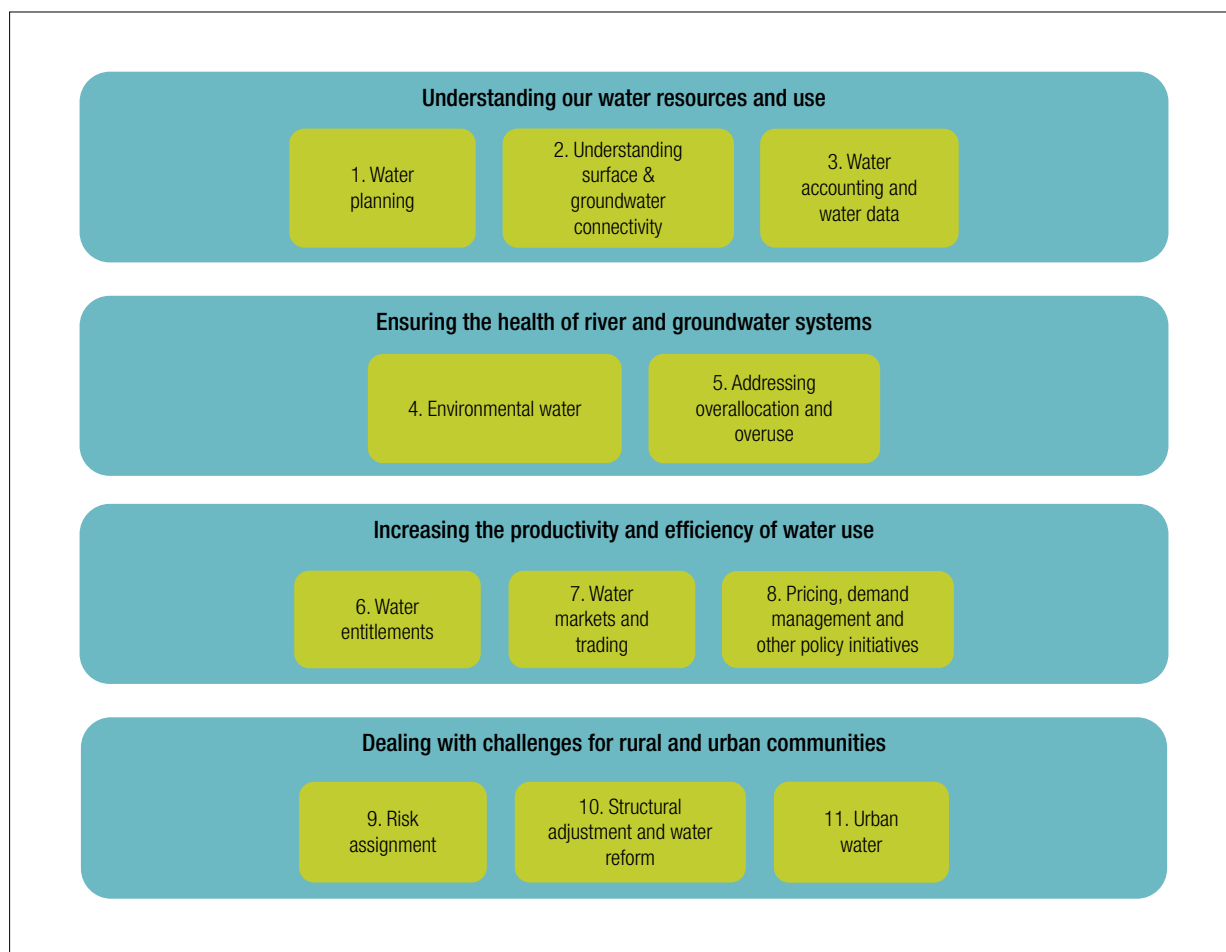
The Commission understands that jurisdictions have differing priorities, and are at different stages of water reform. The states and territories sharing the Murray–Darling Basin (MDB) are obviously an important focus for many areas of water reform, but the Commission believes that many of the challenges in the basin apply elsewhere in Australia. Lessons from the MDB can benefit water management across the nation.

The Commission is convinced that further urban and rural water reform will contribute to the national micro-economic reform agenda and deliver enduring benefits across Australia. These include economic productivity gains, sustainable use of natural resources, and a more harmonised and efficient approach to water management. Such reform is essential as Australia tackles the challenges posed by global economic conditions and climate change.

To produce the 2009 Biennial Assessment, the Commission drew on a wide range of sources, including submissions from the public and NWI parties, many reports and studies, selected consultancies, and a stakeholder forum held in May 2009. The assessment includes examples and case studies to highlight progress, best practice and areas where more effort is needed. Many are jurisdiction specific, but the lessons are often applicable across Australia.

Each chapter of the 2009 Biennial Assessment relates to an objective of the NWI, with an additional chapter on urban water reform. The chapters are grouped into four themes, as shown in Figure 1.

Figure 1: Structure of the 2009 Biennial Assessment



The following overview provides a brief summary of some of the central findings and recommendations arising from each chapter. The full set of the Commission's findings and recommendations are presented within each chapter.

Understanding our water resources and use

Water planning and accounting for our water resources have improved, but further implementation of the agreed national reform agenda is required to fulfil the objectives of the NWI.

Water planning

Water plans are fundamental to water management because they establish a balance between environmental and consumptive uses. Under the NWI, transparent, statutory-based water plans should be developed for all surface water and groundwater management units in which entitlements to water are issued.

The necessary legislative reforms have been completed in all jurisdictions except Western Australia, but ongoing delays in completing and implementing water plans across much of Australia are preventing the full realisation of the benefits of an effective water planning regime envisaged under the NWI. Over the past two years, few new plans have been finalised. Many remain outstanding (in all jurisdictions except the ACT), and timetables for their completion need to be re-established. The Commission considers it is now timely for parties to reset and republish realistic timeframes for the rollout of remaining water plans.

In general, the plans now being developed include a number of improvements compared with earlier plans, such as the inclusion of climate change scenarios. However, at this stage only a few include robust strategies to adapt to climate change.

More generally, there is scope for further improvement in planning:

- + Plans still tend to handle hydrology better than ecological issues.
- + There is no agreed approach to understanding and balancing trade-offs between environmental and consumptive uses.
- + Drought contingency planning remains ad hoc and lacks transparency, which affects the security of water access entitlements.
- + Indigenous economic, cultural and spiritual interests should be more effectively incorporated into planning.
- + Progress continues to be slow in identifying and addressing significant interception of surface and groundwater.
- + In general, monitoring, review and reporting are underdeveloped, despite being essential elements of adaptive water management.

The development and commencement of water plans should be accelerated to allow water users to realise the full benefits of NWI reforms. At the same time, speeding up the pace should be balanced against quality, and particularly the quality of community consultation.

Understanding surface and groundwater connectivity

The NWI parties have agreed to recognise the connectivity between surface and groundwater resources and to manage connected systems as single resources.

All jurisdictions have passed legislation or implemented planning processes that recognises the potential for connectivity, and all have begun assessments of connectivity, as required under the NWI, although their approaches vary significantly. Investments through the National Groundwater Action Plan are also improving our understanding of system connectivity.

All jurisdictions have made some progress in developing integrated management arrangements for identified connected systems. However, the continuing slow rollout of water plans, and a failure to adequately address overallocation in some systems, are inhibiting wide adoption of integrated surface water and groundwater management. The jurisdictions need to strengthen the foundations for integrated management by developing and implementing integrated plans, and by gathering additional data on the nature and extent of connectivity.

The Commission considers that ultimately, all surface and groundwater extractions, including for stock and domestic purposes, should be licensed and metered or otherwise measured. The Commission acknowledges the need for pathways to metering for groundwater extractions, taking into account the water management benefits of better metering, the level of risk to the resource, impacts on third parties, and cost effectiveness.

The Commission considers that unless and until it can be demonstrated otherwise, surface water and groundwater resources should be assumed to be fully connected, and water planning and management of the resource should be conjunctive. This is the reverse of the current situation.

Water accounting

Water accounting tells us how much water is being delivered, traded, extracted for consumptive use, and managed for environmental and other public benefits. It is essential if water policymakers, planners and managers are to make sensible decisions about how to use water, and supports public and investor confidence.

The development of a national framework and standards for water accounting is on track for delivery in 2010. The Bureau of Meteorology, empowered and funded under the *Water Act 2007*, will become the nationally recognised institutional 'home' for Australia's water data and accounting effort. However, the bureau's role is focused on issuing standards, compiling water accounts and publishing the National Water Account. Its role does not encompass advancing the implementation of all aspects of water accounting across all jurisdictions, which remain responsible for many water accounting activities. Therefore, it is essential that the bureau and the jurisdictions continue to work closely together.

The National Water Accounting Development Project is developing standards for environmental water accounting. While there have been some advances in New South Wales, Victoria and the MDB, overall progress remains slow, and only limited success has been achieved in registration and reporting of environmental water as required by the NWI.

The recent finalisation of pattern approvals standards for non-urban meters is an important step forward, but considerable work remains to develop nationally standardised approaches to meter installation and testing, and to implement the standards. The jurisdictions are developing metering implementation plans, but resource constraints are likely to reduce their ability to deliver expanded and accurate metering in line with the plans.

In general, compliance and enforcement activities vary considerably in scope and effectiveness across Australia. The adoption of national principles to guide compliance and enforcement efforts would disseminate best practice and build community confidence, especially across state borders.

Ensuring the health of river and groundwater systems

Progress towards achieving this objective has been disappointing. Moreover, the risk of irreversible environmental damage has intensified as a result of ongoing drought and climate change.

Environmental water

Water-dependent ecosystems exist within waterways, wetlands, floodplains, riparian areas, estuaries and springs and can be supplied by both surface flows and groundwater. Without adequate water at the right time, they lose their capacity to provide environmental services and other public benefits. In some cases, the loss can be irreversible; in others, it can be difficult, costly or take a long time to reverse.

There have been improvements in the use of holistic and peer-reviewed, science-based methods to determine environmental water requirements, but further work is needed to integrate them into adaptive environmental management. Failure to use these robust methods in the past has contributed to the inadequate specification of environmental objectives and flow requirements. This has exacerbated the debate about overallocation and overuse across the country. Because water-dependent ecosystems are so complex, there is a need for better scientific research and systematic processes to apply the best available knowledge to understand and explain the links between environmental water delivery and ecosystem health, and to improve adaptive management.

The Commission is increasingly concerned about the security of environmental water access entitlements and rules-based environmental water, particularly during drought. The Commission considers that water plans should clearly and transparently specify desired environmental outcomes and fully define environmental watering protocols to achieve them under all inflow scenarios (including sequences of dry years).

The Commission is concerned that, in general, the role of environmental water managers is not adequately defined and resourced. They lack recognition, influence and authority, and their role and legitimacy in implementing and operating water plans is often unclear. Too often, they have other responsibilities, which can blur their accountability. The Commission also recommends that greater consideration be given to improving alignment and integration of programs for recovery and management of environmental water, across jurisdictions and geographical scales, and across land and water management.

At a jurisdiction, cross-jurisdictional (e.g. Murray–Darling Basin) or national level there are no consolidated, transparent, accessible and accountable mechanisms for registration of entitlements-based and non-entitlements-based environmental water, or reporting of environmental water delivery to meet specific objectives. Therefore, further work is needed to develop common approaches to registration of environmental water, to promote transparency and accountability and to demonstrate the effectiveness and efficiency of environmental waterings.

The increase in environmental water purchase programs, particularly the Australian Government's \$3.1 billion Restoring the Balance in the Murray–Darling Basin program, is a major positive policy change in environmental water management. The Commission strongly supports continued buybacks, including major purchases, as a strategic approach to improving environmental outcomes and adjusting to the new sustainable diversion limits to be developed under the new Murray–Darling Basin Plan. The Commission does not support the use, by states, of barriers to water trade to attempt to constrain environmental purchases and desirable adjustment.

The Commission considers that the relationship between buybacks, providing for environmental assets, and the transition to new sustainable diversion limits in the MDB is not well understood. Ongoing communication could continue to improve the transparency of these reforms, so building community understanding and support and enabling more informed decision making by entitlement holders. For example, the Commission recommends that the Murray–Darling Basin Authority progressively issue guidance on environmental objectives and environmental water management plans, locally and across the MDB.

Addressing overallocation and overuse

The NWI Agreement aims to complete the return of all currently overallocated or overused systems to environmentally sustainable levels of extraction, and calls for 'substantial progress' in that direction by 2010.

On the basis of this Biennial Assessment, the Commission is disappointed to conclude that this central requirement of water reform will not be met. All reviewed water plans that identify overallocated or overused systems included pathways to return those systems to

environmentally sustainable levels of extraction, but very few, if any, such systems have been successfully transitioned to within sustainable extraction limits.

The Commission has been promoting nationally consistent terminology and definitions of 'overallocated' and 'overused' systems since 2005. Some slow progress has been made in this area, and work is ongoing, but further and faster work is needed to agree on and implement nationally consistent guidelines and approaches.

Groundwater systems make up the vast majority of the water systems currently identified by jurisdictions as overallocated, overused, or both. The Commission is seriously concerned that surface water systems may be under-represented in current assessments by jurisdictions, particularly in the MDB, given evidence such as the Sustainable Rivers Audit and the CSIRO Sustainable Yields Study.

Widespread and prolonged drought over the past decade has resulted in critical environmental degradation in the MDB and across southern Australia. High-profile cases of ecological decline, such as in the Lower Lakes and the Coorong in South Australia, have been linked to a combination of drought and unsustainable levels of extraction. Concerns about poor ecological health have been a reason for governments to recover water for the environment.

Without a clear definition of the sustainable level of extraction in many water systems, uncertainty and debate continue to undermine confidence in the management of Australia's water resources. The agreement to develop new sustainable diversion limits for surface and groundwater systems across the MDB under the new Basin Plan should address this longstanding national challenge in the MDB.

As work progresses on sustainable diversion limits in the MDB, jurisdictions should in the meantime continue with buybacks and other water recovery initiatives (in accordance with NWI principles). The Commission recognises the short timelines the MDBA is working to in the development of the Basin Plan, but in order to promote public confidence, the MDBA should take opportunities to demonstrate how water recovery initiatives are contributing to dealing with specific environmental challenges and to explain the relationship between buybacks and the transition to sustainable diversion limits.

Increasing the productivity and efficiency of water use

On the whole, there have been significant advances towards this objective. Further efforts and reforms to enhance market performance, promote competition and efficient investment, and develop a more seamless regulatory environment are likely to deliver substantial national productivity benefits both in the short and long term.

Water entitlements

Where access to water is insecure, users are likely to lack the necessary confidence to invest in new capital equipment, better management and infrastructure. Water entitlements of various forms have long been used to define users' access to water, and concern about the clarity, flexibility and consistency of those entitlements was a significant driver for water reform. The NWI established a framework for developing clear, nationally compatible and secure water access entitlements, to be defined in statute as a perpetual or ongoing and exclusive entitlement to a share of water.

Significant progress is being made in this area through legislative reform and the 'unbundling' of water entitlements from land. However, implementation of the NWI water access entitlements framework remains slow in some jurisdictions. How far jurisdictions intend to roll out NWI-consistent water access entitlements, particularly in unregulated surface and groundwater systems, remains unclear. Where they do not intend to fully adopt the NWI framework, they have not documented alternative plans to improve the security of entitlements. The Commission recommends that jurisdictions review and reset their implementation plans within six months to spell out the proposed extent and timetable for entitlement reforms across all water systems.

The development of water markets and the challenges of drought have highlighted the need for more complete and transparent specification of water entitlements and allocation methods, particularly during sequences of low-inflow years. Despite examples of positive reforms and good practice, the Commission is concerned about the robustness and transparency of allocation systems during periods of critical water shortage, which are expected to become more frequent as a result of climate change.

Entitlements for new and alternative sources of urban water supply, such as stormwater and managed aquifer recharge, need further consideration, while recognising the interdependent nature of urban water sources.

The Commission considers that miners, plantation forests and a range of other large industrial water users now need to be better integrated into the water access entitlements framework, so that those industries can reap the benefits of more secure water access and trade and further contribute to national productivity gains and long-term economic performance. Where full integration is not possible, appropriate alternative arrangements need to be clarified and implemented as soon as possible.

Water markets and trading

Water markets provide opportunities for water to be reallocated between competing uses, and an effective market for water trading gives entitlement holders the flexibility they need to respond to drought and climate change. The development and enhancement of water markets represents a centrepiece of national water reform, and provides an example of successful national micro-economic reform, boosting Australia's economic performance during challenging times.

Over the last two years, good progress has been made to ensure that jurisdictions have the institutional, regulatory and administrative arrangements to enable trade in water, particularly in the MDB. Water trading is already delivering tangible benefits for buyers and sellers inside and outside the MDB. Without the ability to trade, the impacts of the prolonged drought on industries, communities and individuals across the MDB would have been much worse.

Outside the MDB, planning and entitlement reforms need to be pushed along to develop new and expanded markets for water. Within the basin, the Commission argues strongly that remaining artificial trade barriers, which are distorting and hampering adjustment and efforts to address overallocation and overuse, be removed. In particular, the annual 4% limit on water entitlement trading out of an irrigation area is being reached in regions in several basin states, with a wide range of undesirable consequences. The 4% limit is:

- + impeding the use of buyback programs to help return overallocated water systems to sustainable levels of extraction
- + unfairly and arbitrarily penalising willing sellers of irrigation entitlements
- + distorting patterns of water trade out of irrigation areas (including interstate trade)
- + inhibiting desirable and necessary structural change
- + complicating interstate collaboration in other areas of water reform.

Under the *Water Act 2007*, the Minister for Climate Change and Water, based on advice from the Australian Competition and Consumer Commission (ACCC), is to develop new water market and water charge rules to apply in the MDB. The rules are an important step in addressing a range of other barriers to trade and encouraging a more harmonised approach, but it will be important that they are implemented effectively across the basin. More broadly, a number of potential market distortions, such as interstate and intrastate allocation processes and government interventions, require further investigation.

There have been some improvements in the processing of water transactions and water market performance. However, processing delays, especially for trade in water access entitlements (compared with allocation trade), continue to undermine the efficiency and effectiveness of water markets. Public reporting of performance against recently agreed COAG service standards is expected to drive significant future improvements in trade processing times, both within and between jurisdictions.

Significant efforts have been made to improve confidence in market intermediaries, in particular through the provision by authorities such as the ACCC of better information about rights and obligations under consumer protection legislation. Some cases of misconduct have been reported, but the low number of complaints suggests that there is not yet a compelling case for industry-specific regulation of water market intermediaries, beyond the trade practices and consumer protection regulations.

Pricing, demand management and other policy initiatives

A central aim of the NWI is to implement policies that promote water use efficiency and innovation in urban and rural areas.

Efficient pricing or charging for water-related services underpins investment and provides signals for the efficient use of water services. Getting the price signals right by ensuring that they fully reflect the efficient costs of providing the services is a key element in encouraging innovation and efficient water use. Jurisdictions have made some pricing reforms over the past two years, and substantial progress has been made towards the development of national NWI pricing principles. These principles have not yet been adopted and in the Commission's view, it is time they were. Despite their slow development, once the principles are agreed they will guide more substantive future reform. The Commission considers that implementation of further pricing reforms has the potential to drive innovation and deliver significant economic benefits across Australia, in a sustainable manner.

The Northern Territory is the only jurisdiction yet to achieve lower-bound pricing and establish a pathway towards upper-bound pricing for metropolitan water storage and delivery services. However, the territory has recently announced significant price increases in order to move towards lower-bound pricing by 2011–12.

Progress in meeting NWI commitments for cost recovery for water planning and management for both surface and groundwater has been very limited. Further advances in this area are needed in Queensland, Western Australia, Victoria and South Australia and nationally to implement consistent approaches. While the *Water Act 2007* gives the Minister powers to develop water charge rules for water planning and management activities (based on advice from the ACCC), it is difficult to apply these rules in the way envisaged in the NWI Agreement.

Governments have invested significantly in demand management initiatives, particularly in urban areas, and those initiatives have been useful in contributing to reductions in per capita consumption and managing the impacts of drought. However, while water use efficiency technologies are a good tool for demand management, uptake will be improved if efficient pricing mechanisms are in place. A clear price signal provides an incentive for individuals and businesses to make sound decisions about water use and investments in water-saving technologies and alternative supplies. While non-price approaches to demand management (regulatory requirements, subsidies, restrictions) are useful in some cases, their costs, benefits and sustainability need to be assessed. For example, with water restrictions, the costs to the community are usually hidden. The Commission supports efforts to improve consumer information and to remove regulatory barriers to innovation. Such measures will be more effective in moderating demand if coupled with appropriate pricing.

Dealing with challenges for rural and urban communities

Since the 2007 Biennial Assessment, risk assignment, structural adjustment and urban water reform have gained greater prominence, particularly in the light of ongoing drought, climate change, and new institutional and policy arrangements aimed at managing reduced water availability.

Risk assignment

The NWI risk assignment framework defines how the risks of reduced or less reliable water allocations are to be shared between water access entitlement holders and governments. It is intended to give water access entitlement holders more planning and investment certainty about how changes in water availability will be dealt with, and so contribute to a robust, transparent and sustainable water planning framework in the long term. However, the NWI risk assignment framework is not well understood by stakeholders.

The NWI Agreement requires jurisdictions either to adopt the specific NWI risk assignment provisions or devise an alternative approach. New South Wales and the Commonwealth (in the context of the Murray–Darling Basin) are the only jurisdictions that have adopted the specific NWI risk assignment provisions. Queensland and the ACT have stated that they intend to amend legislation to adopt the NWI provisions as a result of recent changes to the *Water Act 2007*. Other jurisdictions have adopted (or intend to adopt) alternative risk assignment approaches, or have not yet decided their approach.

Under the NWI Agreement, the NWI risk assignment framework only applies once NWI-consistent water plans are in place and overallocation has been addressed. However, there is significant uncertainty about the definition and classification of overallocation, particularly in the MDB. There is evidence that this is contributing to uncertainty (in the MDB irrigation community and in governments) about the commencement of the provisions and how they relate to new sustainable diversion limits under the new Basin Plan.

It is also not clear how easily governments will be able to implement the NWI risk assignment provisions in practice, given that multiple factors are likely to reduce future water availability for allocation to water access entitlements. In addition, there is little guidance for assessing whether alternative approaches to risk assignment developed by jurisdictions meet the overarching objective of providing certainty and security to entitlement holders, and limited understanding of how those approaches will align with the new institutional arrangements in the MDB.

The Commission considers that there is a need to clarify these ambiguities and uncertainties, and to ensure that the risk assignment provisions and the methods and processes for their effective implementation are clearly defined and understood.

Structural adjustment and water reform

Structural adjustment is the continuing process of change in the size, composition and characteristics of industries, which occurs naturally in response to a range of market, technological and environmental factors, as well as in response to government policy reforms. Adjustment should be seen as a necessary and positive phenomenon bringing opportunities for innovation and improved productivity. Across much of Australia, and in particular in the MDB, future reductions in water availability, combined with many other factors such as commodity prices, exchange rates and social trends, will contribute to ongoing adjustment in the irrigation sector and irrigation-dependent communities.

Future reductions in water availability for irrigation in the MDB are expected to result from a combination of factors including drought, climate change and the establishment of sustainable diversion limits for surface and groundwater systems. For broad planning purposes, it is important to understand that these reductions are likely to be very significant. For example, the Commission estimates that in the order of 30% less water could be available for irrigated agriculture in northern Victoria in the years ahead.¹ So while irrigation industries and communities have been responding to many and varied forces of change for decades, reduced water availability will add to these pressures.

Water reforms outlined in the NWI aim for more environmentally, economically and socially sustainable water management. Water markets play a critical role in this transition to sustainability by giving entitlement holders the opportunity to make their own adjustment, investment and production decisions. By removing barriers to trade and other policies which otherwise impede the natural and continuing process of adjustment, governments can facilitate this necessary and positive process. Water trade and environmental water purchase programs should be allowed to proceed in a timely, agreed and coordinated way, unencumbered by artificial trade barriers. At a time of drought and difficult market conditions, irrigators need more options and flexibility rather than less.

Government interventions (e.g. in the form of financial assistance or barriers to trade) which slow down the natural and desirable process of adjustment can distort important water reform objectives such as movement of water to its highest value use. Governments should bear these implications in mind when considering any policies and programs, and aim to ensure that distortions are minimised wherever possible. The Commission considers that, where governments are concerned about the outcomes of adjustment processes, there could be benefit in adopting a consistent and transparent approach to assessing the need for government intervention. Carefully considered and clearly explained policy in this area is important in sending the right signals for efficient investment and adjustment, which will benefit Australia's long-term productivity. Irrigation-dependent communities too will benefit from being able to make more informed and confident decisions as they respond to the pressures and opportunities for change.

Urban water

Urban water supply has become a critical national issue. Population growth and declining water availability as a result of prolonged drought have led to severe water restrictions in many of Australia's towns and cities. Governments are responding in various ways, including investing in new water supplies, improving the management and delivery of urban water services, and allowing for greater innovation and more efficient water use. As governments have moved to diversify supply sources away from the traditional reliance on rainfall-dependent dams, they have been confronted by issues relating to planning, regulation, pricing, market and institutional reforms, and public confidence.

COAG-led reforms to develop draft national pricing principles, national urban water planning principles and a set of urban water reform actions under the 2008 COAG Work Program on Water provide a platform for further national reform. Much more work is required to fully implement these agreed principles, in particular to establish transparent urban water supply security standards, and to develop strategies for urban water security that are flexible and robust, and which will secure water supplies in an uncertain climate. 'Readiness' strategies that progressively stage commitments to large, capital-intensive projects while uncertainty is reduced are critical in minimising the costs and risks of oversupply and undersupply.

Significant institutional and regulatory reforms are underway in the Australian urban water sector. For example, the recent development of sophisticated national guidelines for safe and effective potable and non-potable reuse of water is the first step in support of growth in new and alternative sources of water supply. However, further work is required if enduring, cost-effective and sustainable solutions are to emerge. For example, the Commission supports the agreement in the COAG Work Program on Water to promote the use of competition and further examine the case for micro-economic reform in the urban water sector.

In summary, while good progress has been made in delivering the limited set of urban water actions committed to under the NWI, new challenges that were not as evident when the NWI was signed have arisen: changing and less predictable rainfall and runoff patterns, uncertainty about climate change, community demands for sustainable water supply solutions, and increases in water prices to pay for new water infrastructure. Given the scale of the challenges, a lot remains to be done to achieve reliable, healthy, safe and sustainable urban water supply.

¹ The Commission stresses that this estimate is intended to be indicative only, and that to obtain an accurate estimate a much more rigorous analysis would be required. As discussed in detail in section 10.2.2, a number of caveats apply and various simplifying assumptions were made. Importantly, this figure is not an estimate of the reductions that might eventuate as a result of the new Basin Plan, which will aim to address past overallocation as well as the impacts of climate change.

Additional actions necessary for water reform in a challenging environment

Despite the progress that has been made over the past two years, there have been delays in implementation in almost every area of the NWI. Moreover, the fundamental challenges driving the NWI in 2004 persist. Indeed, the need for more significant reform to move Australia's water resources to a sustainable footing has, if anything, intensified.

Drought has caused potentially irreversible environmental degradation, including of important natural ecosystems such as the Lower Lakes and Coorong and the river red gum forests along the Murray River. Drought, combined with market factors, has also had a devastating impact on irrigation businesses and irrigation-dependent communities. The water reform challenges are broadening, as new needs are emerging across the urban water cycle and in the mining and industrial sectors.

Dealing with these and other emerging challenges in the long term requires more than adopting the Commission's recommendations in each of the individual areas discussed in the biennial assessment. In the Commission's view, the key cross-cutting actions needed to achieve the objectives of the NWI in Australia's current circumstances include:

- + **Painting a clearer picture of the move to a more sustainable level of extraction across the MDB.** The new institutional arrangements for the MDB provide a historic opportunity to address a critical national challenge. The commitment to establish new sustainable diversion limits under the Basin Plan needs to be integrated with complementary initiatives, such as environmental purchase programs and investments in irrigation infrastructure renewal. This integrated vision needs to be communicated to the irrigation community and other stakeholders to enable a smooth transition to a more certain yet sustainable future.
- + **Embedding flexibility and robustness into water planning and management to cope with uncertainty associated with climate change.** Climate change is now more evident and accepted than in the past. In the two years since the previous biennial assessment, it has become increasingly clear that adaptation to the potential impacts of climate change needs to be embedded in all aspects of water planning and management. Water management needs to go from merely assessing the potential impacts of climate change to developing robust but flexible strategies to provide security for entitlement holders and the environment, in increasingly uncertain circumstances. Low-flow contingency strategies should become a transparent component of 'normal' management and operational arrangements, rather than a reason to suspend or modify pre-existing plans, or adopt ad hoc rules.
- + **Ensuring that lessons from the MDB are reflected in a principled and proactive approach to water management elsewhere.** The MDB experience provides lessons for northern Australia and Tasmania, where there is potential future irrigation development. It is critical that the mistakes of the past are not repeated. In particular, principled approaches to water planning and management need to be adopted. For example, tough decisions about overallocation and overuse should not be deferred, and subsidies for the provision of water (which encourage overuse) should be avoided. A proactive approach is required, with the right policies and principles put in place *before* problems arise.
- + **Remaining focused on outcomes.** While agreed definitions and national consistency are important, further effort is needed to avoid time-consuming and costly debate among officials about technicalities and to remain focused on achieving the planned outcomes of the NWI. Reform effort needs to recognise the differences in the levels of development and understanding of water systems across Australia and tailor reforms to suit particular needs, while remaining true to the underlying principles of the NWI.
- + **Addressing resource and capacity constraints within the water industry.** As in many other industries, the water sector's workforce includes an ageing cohort of highly experienced technical and policy professionals, and a significant proportion of relatively new recruits. Over the coming years, training and professional development will be needed to ensure that the industry maintains the necessary human capital and other resources required to deliver on the national water reform agenda. As reform goes ahead, it will be increasingly useful to draw on new skills from other sectors, for example to support new approaches to water accounting and data management.
- + **Clarifying roles and responsibilities.** As institutional arrangements in water management have evolved it has become increasingly important to clarify the roles and responsibilities of government agencies to minimise duplication and improve policy coordination. The role of COAG in promoting reforms needs to be clearly defined and delineated from the roles of the jurisdictions. Similarly, the Bureau of Meteorology, the Murray–Darling Basin Authority and the ACCC, in taking up roles defined in the *Water Act 2007*, should ensure their activities are clearly distinguished from those of other agencies at the state or regional level. Policies will need to be sequenced appropriately so that the transition costs of reforms are minimised. Further institutional reforms that reinforce the separation of policy, regulatory, audit and service provision roles may need to be considered.

- + **Community partnerships and improved communication.** To ensure that water reforms endure, it is essential that they be informed by knowledge and understanding of water resources held within the community, and accepted by the community. This does not mean that tough decisions should not be made, but that Australians are more likely to accept decisions involving some hardship if they understand and support the goal: sustainable water use, sustainable ecosystems, and a sustainable and prosperous economy. The Commission encourages all governments to more clearly communicate the benefits of a unified and principles-based approach to water reform, especially those benefits that will flow from a move to more sustainable levels of extraction and a more sustainable, confident and secure irrigation sector.

The Commission encourages renewed effort by all parties to ensure that Australia obtains maximum benefit from the NWI, which the Commission continues to regard as an enduring and internationally recognised blueprint for water management.