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# Water trading and markets

Supporting Paper B

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## GUIDE TO THE SUPPORTING PAPERS (AND DESCRIPTOR)

SP A Water entitlements and planning (*Entitlements and planning*)

**SP B Water trading and markets (*Trading*)**

SP C Environmental management (*Environment*)

SP D Securing Aboriginal and Torres Strait Islander people's interests in water (*Cultural access*)

SP E Ensuring the integrity of water resource management (*Integrity*)

SP F Urban water services (*Urban*)

SP G Urban water services: regional and remote communities (*Regional*)

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## Key points

- Reforms have facilitated the development of water markets, which in turn have allowed a significant growth in trade and development of irrigation industries over the past 30 years.
- A large majority of trade occurs in the southern Murray–Darling Basin (MDB) where hydrological connections and a large number of users create the key pre-conditions. Outside of the MDB, trade has increased gradually in some water systems where characteristics permit.
  - Queensland surface water markets and South Australian groundwater markets have seen particularly strong growth in entitlement trade volumes.
  - Northern Australia has been recognised as an area where secure water rights could enable the future development of trading.
- Although relevant NWI commitments have been achieved or largely achieved, there is scope to build on these foundations.
- Recommitting to the original NWI water markets and trading principles would support the objective that arrangements facilitate the efficient operation of markets, where system and water supply considerations permit. These principles will become increasingly important in enabling irrigators, in particular, to manage through drought and adapt to a changing climate.
- The addition of principles to support best-practice governance, regulatory, operational and informational arrangements would enhance possible gains from trade in the diverse range of Australian water systems as they develop — drawing on the lessons from 30 years of trading and recent reviews in the MDB.
- There is a gap at the system level in the proactive monitoring of water trading (particularly long-term market dynamics), and its interaction with resource availability and system constraints. No entity is currently responsible for overseeing trade operations within the broader, long-term water resource management and system operation context.
  - Where appropriate, jurisdictions could consider establishing such a function, distinct from the existing oversight, regulatory and compliance functions performed by various entities to address this gap.
- A renewed NWI should continue to provide principles on water registers to support jurisdictions' decision making about the provision of basic entitlements and trade data.

The creation of water rights, separate from land, coupled with caps on consumptive use set up the drivers for the trade of water. Trade includes transactions within a season (predominantly called allocation trade), the permanent transfer of water rights (entitlement trade) and a growing range of diversified tradeable products that transfer water access and use rights across space and time. Trading enables scarce water resources to move between uses, promoting efficiency and benefiting the community as a whole.

Under the National Water Initiative (NWI), all jurisdictions agreed to a common set of objectives, outcomes and actions to facilitate the development of efficient water markets in Australia, building on previous reform effort. The NWI broadly focused on the 'progressive removal of barriers to trade in water' and other arrangements to facilitate an open trading market.<sup>1</sup>

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<sup>1</sup> NWI paragraph 23(v).

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The NWI intent and objectives providing for water markets and trading not only remain relevant today, but will become even more important, particularly for irrigators, in enabling them to manage through drought and adapt to a changing climate. However, many of the substantive actions that jurisdictions committed to, were focused on liberalising trade in the Murray–Darling Basin (MDB). And since the NWI took effect in 2004, a range of specific legislative instruments and agreements, such as the *Water Act 2007* (Cth) and the 2012 Murray–Darling Basin Plan (Basin Plan), have been developed to govern the MDB water market — superseding the NWI. Moreover, most of the specific actions in this element have been completed. As the Commission observed in 2017, the relevant 2004 NWI commitments have been achieved or largely achieved — but there is scope for further gains from incremental reform (PC 2017, p. 118).

A renewed NWI should assist entitlement holders and communities to meet the challenges posed by a changing climate and growing population. Water markets will be an increasingly valuable tool in the management of water resources given these and other trends. Fit-for-purpose governance, regulatory, operational and informational arrangements are central to sustaining markets of this type. Inclusion of a more detailed set of principles in a renewed NWI that reflects these arrangements would better underpin the development of markets and trading in non-MDB parts of the country — and build on the lessons from the MDB.

A renewed NWI will not be the policy lead in the MDB. Reform of the MDB water market arrangements will, however, need to be consistent with NWI principles. The Australian Competition and Consumer Commission’s (ACCC) Murray–Darling Basin Water Markets Inquiry (2021) has provided advice to governments on possible reforms to water markets in the MDB, which, at the time of writing, was under consideration. After almost 30 years of operation, this review of the MDB water markets also provides nationally-relevant lessons in the management and future development of water markets.

This paper includes:

- a summary of the development and status of water trading in Australia (section 1)
- a discussion about fit-for-purpose market arrangements that account for hydrological, economic and institutional pre-conditions (section 2)
- principles for efficient water trading and markets for inclusion in a renewed NWI (section 3)
- a summary of the Commission’s advice on water trading and markets as part of NWI renewal (section 4).

## **1 Development and status of water trading**

Australia is widely regarded as a world leader in the establishment and management of water markets (Horne and Grafton 2019, p. 167). Trade in water allocations and entitlements has increased significantly from small beginnings over 30 years ago, primarily in the MDB. In

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2018-19, Australia’s water markets were estimated to have generated \$5.2 billion in turnover (BOM 2020a, p. 7). Water management reforms, including those under the NWI, have been essential in establishing markets, increasing trade and making water markets more efficient.

For further reference, the Commission’s inquiry into National Water Reform (2017) provides a detailed description of the development of water trading in Australia and the progress of reforms to 2017. And the Commission’s assessment (*Assessment*: section 2) reviews jurisdictional progress since 2017 against NWI commitments to facilitate water trading and markets, finding that jurisdictions have made progress in reducing unwarranted trade barriers, improving water registers and reducing transaction costs through improved water market information. Since 2017, there has been further progress in reforming water trade and market arrangements, and most jurisdictions have largely achieved their commitments against the NWI in this area.

## 1.1 Patterns and drivers of water trade

Understanding the context of where water trade currently occurs — in systems where the consumptive share of water resources are close to or fully allocated<sup>2</sup> — will help in assessing how trade-enabling reforms may impact future trading activity (*Report*: chapter 5).

Trade is concentrated in the southern Murray–Darling Basin ...

By volume, over 80 per cent of water allocation trade activity occurs in the hydrologically connected southern MDB (table 1). Regions outside the MDB with significant quantities of trade (in both entitlements and allocations) include Fitzroy, Barron, Burdekin and Burnett (all in Queensland), South East South Australia, Thomson–Macalister (Victoria), Hunter (New South Wales), Harvey (Western Australia) and irrigation schemes in Tasmania.

... but there are pockets of growth elsewhere

Each water system has distinct underlying characteristics that shape market development.<sup>3</sup> The degree to which the consumptive share of a water resource is close to full allocation or fully allocated will significantly influence the possibility of trade — if water needs can be met through issuing new entitlements, then trade will not generally occur. The potential for water trade also relies on a range of hydrological and economic pre-conditions that are necessary for trade (section 2.1). These underlying characteristics largely explain why

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<sup>2</sup> The precise meaning of the term ‘fully allocated’ varies by jurisdiction. In this context and throughout the paper, it is used to refer to water systems where the sustainable level of extraction has been reached and new consumptive water demands are unable to be met through the issue of new entitlements.

<sup>3</sup> A water system is hydrologically connected and described at the level desired for management purposes (for example, sub-catchment, catchment, basin or drainage division, and/or groundwater management unit, sub aquifer, aquifer or groundwater basin) (NWI schedule B(i)).

systems outside the southern MDB have significantly lower volumes of trade and why some systems have very little trade or none at all.

**Table 1 Trade summary by region and resource type, 2019-20**

Region	Resource type	Allocation trade <sup>a</sup>		Entitlement trade	
		GL	Share %	GL	Share %
<b>Southern MDB</b>					
	Regulated surface water	5 527		775	
	Unregulated surface water	0		20	
	<b>Totals</b>	<b>5 527</b>	<b>88</b>	<b>795</b>	<b>41</b>
<b>Northern MDB</b>					
	Regulated surface water	130		283	
	Unregulated surface water	60		157	
	<b>Totals</b>	<b>190</b>	<b>3</b>	<b>440</b>	<b>22</b>
<b>MDB Groundwater<sup>b</sup></b>					
	Groundwater	291		184	
	<b>Totals</b>	<b>291</b>	<b>5</b>	<b>184</b>	<b>9</b>
<b>Rest of Australia</b>					
	Regulated surface water	236		136	
	Unregulated surface water	3		182	
	Groundwater	28		224	
	<b>Totals</b>	<b>267</b>	<b>4</b>	<b>542</b>	<b>28</b>
<b>Australia</b>					
	Regulated surface water	5 893		1 194	
	Unregulated surface water	63		359	
	Groundwater	319		408	
	<b>Totals</b>	<b>6 275</b>	<b>100</b>	<b>1 961</b>	<b>100</b>

<sup>a</sup> Allocation trade data include environmental water transfers. These transfers within and between water systems were to achieve environmental watering objectives. In 2018-19, the most recently available year of data, these were 36 per cent of all allocation trades by volume (BOM 2020a). <sup>b</sup> The MDB groundwater systems overlap the northern and southern MDB.

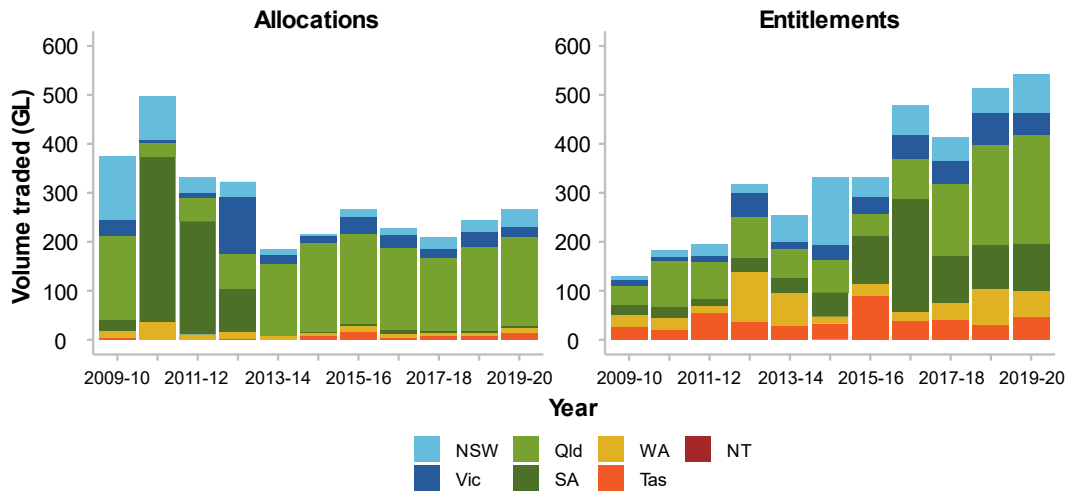
Source: BOM (2020b).

In the northern MDB, trade is limited due to the smaller public storages and greater volumes of unregulated surface water (that is, their flow cannot be controlled or captured in public storages). Trade in MDB groundwater systems has higher transaction costs relative to surface water, which means that this is more often traded when surface water is scarce (de Bonviller, Wheeler and Zuo 2020, p. 7).

Outside of the MDB, trade has increased gradually where the characteristics of water systems permit, and is likely to grow further in the future. Permanent entitlement trade in particular has been increasing over time (figure 1) — up 195 per cent over the past decade (from a low base). Most of the growth has been in surface water entitlements in Queensland and groundwater entitlements in South Australia. Permanent entitlement trade generally supports

structural shifts in water use, including the entry of new water users and new types of uses in fully allocated regions.

Figure 1 Water trade outside of the MDB<sup>a</sup>



<sup>a</sup> The Northern Territory recorded seven trades in 2019-20, which have not yet been incorporated into BOM's water market data.

Sources: BOM (2020b); DENR (2020).

The development of northern Australia, particularly investment in irrigated agriculture, represents an opportunity for future water trade (IA 2016, p. 114) The Northern Territory has made significant changes to its water entitlements and planning systems, which led to its first water trades in 2019. And Queensland and Western Australia are exploring options for water reforms that would further support trading (*Assessment*: section 2).

## 1.2 Impacts of water trade

Water trading has led to a range of benefits

Overall, the development and operation of water trading in Australia has provided an efficient mechanism to reallocate water, delivering net benefits to the Australian community (NWC 2012, pp. 99–106). While benefits so far have accrued mainly to consumptive users, the environment has also benefited. Cost-effective recovery of water in over allocated systems has been made possible by water markets (Grafton and Wheeler 2018, p. 504). Governments have been able to recover water for the environment from private water users at market rates (*SP C Environment*).

For many irrigation businesses, water is not only an input to production but also a significant asset — the value of entitlements held by active and retired farmers and environmental water



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holders is \$26.3 billion (Aither 2020, p. 5). In 2018-19, the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) found that water entitlements comprised between 35 and 41 per cent of capital assets of irrigated farms in the southern MDB, depending on the industry (ACCC 2020, p. 7). Recent modelling by ABARES estimated that over the past two decades, inter-regional trade and carryover provided an average \$117.1 million per year in benefits to irrigators in the southern MDB, relative to a scenario with no trading and carryover (Hughes et al. 2021, p. 17). These benefits reflect the net proceeds from selling water, lower water prices and increased use of water in relatively more productive activities.

Water trade also aids in the management of water supply risks (Nauges, Wheeler and Zuo 2016, p. 456). The capacity for irrigators, firms, towns or industries to manage weather and other shocks is enhanced by the flexibility that markets offer in providing short-term access to water. Prices transmit information to water users allowing for the dynamic adjustment of business models and practices to changing circumstances. Water markets have helped to support an upward trend in the value of irrigated agricultural production in the southern MDB since 2010-11, despite volatile climatic conditions (ACCC 2021, p. 1).

Looking ahead, climate change is likely to cause a long-term decline in available water in a number of regions, as well as more frequent and intense periods of water scarcity. This will prompt adaptation within and between water user groups. Water trading is an important and cost-effective part of a suite of adaptation strategies (that also includes, for example, changing land use and water supply augmentation) that will be required in a changing climate (Loch et al. 2013, p. 1).

But there have been some downsides, particularly in the MDB

Increased volumes of trade, particularly in peak periods, have led to negative impacts on the environment, including erosion and unseasonal high flows during the delivery of water traded downstream. Unseasonal flooding of the red gum forests around the Barmah Choke has been a prominent example in the past (MDBA 2019).

In addition, there have been complex and cumulative flow-on impacts of water trading and its long-term effect on other irrigators and adjacent industries (Whittle et al. 2020, p. 6). For example, where irrigators in shared water distribution systems sell their entitlements out of their system and reduce their water use, water delivery costs for other irrigators in that system increase. In smaller, irrigation-dependent communities, businesses in other industries can experience flow on demand impacts where declining regional water use results in farmer exits and a decline in agricultural output, regional processing and jobs (SP H *Rural*) (Sefton et al. 2020, p. 59). While this may occur in certain regions, the claim that water trade is a significant driver of farmer exit has been contested (Wheeler, Xu and Zuo 2020, p. 562).

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Nationally, water trading activity and market participation have been increasing over time (ACCC 2021, p. 566).<sup>4</sup> While a number of submissions reaffirmed the support for water markets among irrigators (for example CICL, sub. 7, p. 6; AgForce, sub. 24, p. 5; NIC, sub. DR174, p. 18), there has been evidence of declining confidence in water markets among some groups and communities (Wheeler et al. 2020, p. 150). Perceptions of market fairness have also declined in recent years (Schirmer and Peel 2020, p. 44). Trust and confidence in water trading and markets influence their efficient functioning through participation; markets with greater participation of buyers and sellers typically have lower transaction costs.

The ACCC’s Murray–Darling Basin Water Markets Inquiry highlighted a number of issues and ‘deficiencies in current water trading arrangements’ (ACCC 2021, p. 2), which undermine the efficiency of water markets in this system (box 1).

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**Box 1            ACCC Murray–Darling Basin Water Markets Inquiry and the NWI**

On 26 February 2021, the Australian Competition and Consumer Commission (ACCC) released its *Murray–Darling Basin Water Markets Inquiry: Final Report*. It found that, while water markets provide net benefits to the community, the Murray–Darling Basin (MDB) market arrangements have ‘significant deficiencies’ (p. 2). The ACCC recommended a comprehensive package of reforms (and an implementation plan) which aims ‘to restore confidence in water markets across the Basin, and to improve their operation and efficiency’ (p. 2).

The recommendations centre around four themes:

- governance of the Basin water markets
- market integrity and conduct
- trade processing and water market information
- market architecture.

These recommendations are proposed to be implemented in three stages. In stage 1, the ACCC proposes improving current trade arrangements and existing commitments. Stage 2 involves creating new market-focused governance, oversight and information arrangements through: the introduction of new legislation; creating an independent, MDB-focused Water Markets Agency; adopting Water Market Data Standards; and improving trade rules and rule-making processes. In stage 3, the ACCC proposes a range of measures to strengthen governance and designates responsibility for delivery between the Water Markets Agency and the Australian and Basin State Governments.

(continued next page)

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<sup>4</sup> Increasing participation can be observed through a number of measures: the number of locations where trading occurs in Australia; the number of irrigators; the number of trades; volume of trades; and, in some locations, a greater diversity of market participant types.

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**Box 1** (continued)

This report is the first of its kind in almost 30 years of MDB market operation. It provides a strong mandate for modernising MDB market arrangements, while recognising the significant cooperation and coordination that will be required between the Australian and Basin State Governments to give effect to the reforms. The proposed reform agenda is consistent with current NWI principles and objectives, but builds on a range of specific legislative instruments and agreements covering MDB water markets that have emerged separately from national water reform processes. In renewing water trading and market principles in the NWI, lessons from the MDB can help to ensure that market arrangements remain in step with the growth in water trading in other systems as they develop.

At the time of writing, governments were considering their response to the inquiry findings and advice.  
Source: ACCC (2021).

### 1.3 Markets can be broader than volumes and access

In addition to the core water products (permanent entitlements and seasonal allocations), the NWI sought to enable development of other trading options.<sup>5</sup> The value of water as a commodity is derived not only from its quantity, but also its quality, reliability, timing, location and use (Chong and Sunding 2006, pp. 242–243). Opportunities to develop additional trading options lie in: the unbundling of water access rights; development of secondary markets; and the establishment of property rights for water quality and pollution markets.

Unbundling of water access from the right to delivery and storage can create markets that facilitate the efficient allocation of scarce capacity constraints. Coleambally Irrigation Co-operative Limited (sub. 7, p. 5) (and other irrigation infrastructure organisations), for example, have established ‘delivery entitlements’ separate to irrigation right ownership. Lease arrangements have unbundled the duration of access — for durations longer than seasonal allocations, but shorter than permanent entitlements. The recognition and protection of these property rights and the removal of regulations that might limit their trade would enable wider adoption of these types of markets in hydrologically suitable systems.

Secondary water products are contracts based upon underlying water assets (entitlements and allocations). These products allow market participants to take positions on future water prices or quantities through forward contracts, calls and options, acting as a risk management tool (Bayer and Loch 2017, p. 2). Increased participation of financial investors, large agribusinesses and environmental water holders can support market depth for these products and increase the diversity of risk preferences (Seidl, Wheeler and Zuo 2020, p. 13).

There are also a number of opportunities to potentially improve the specification of property rights; and support wider adoption of market instruments in other aspects of water management outside of consumptive water access markets.

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<sup>5</sup> NWI paragraph 58(iii).

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- Market-based instruments can support water quality outcomes and manage pollution (PC 2006, p. 135). The most prominent current examples are in salinity (for example, the MDB salinity credit and debit arrangements and the Hunter River Salinity Trading Scheme) and nutrients (Hawkesbury–Nepean offset scheme) (DEC 2003; Fairbairn 2018). The complexity of water quality management, however, will require carefully considered market design to be successful in other contexts (Fisher-Vanden and Olmstead 2013).
  - As urban centres look to adopt integrated water cycle management, there may be opportunities to adopt trading instruments to manage stormwater. Clear property rights and supporting institutional arrangements will be necessary for this to occur (SP A *Entitlements and planning* and SP F *Urban*).
  - The use of markets to support environmental outcomes has been a prominent approach to water recovery in the MDB (SP C *Environment*). Environmental water holders will require further development of market instruments, particularly in unregulated systems, coupled with the removal of some remaining trade barriers to enable markets to support the achievement of environmental objectives in all systems.

## 2 Pre-conditions for trade and efficient markets

This section describes the pre-conditions for efficient water trade and markets that are used in developing principles in section 3.

In considering principles for water trading and markets for a renewed NWI, the primary objective should be to facilitate the efficient use of water.<sup>6</sup> Water trading and markets can only function efficiently if they have effective governance, regulatory, operational and informational arrangements. And the implementation of these arrangements should be fit for purpose — across the diverse range of water systems, reforms should balance the costs and benefits associated with their implementation. The pre-conditions described in this section include hydrological and economic conditions and the concept of fit-for-purpose institutional arrangements.

### 2.1 Hydrological, institutional and economic pre-conditions for trading

Before water managers develop the necessary arrangements to facilitate trading, a number of pre-conditions have to be considered (NWC 2011, p. 10):

- the consumptive share of a system is close to full allocation or fully allocated (and this cap is able to be enforced)
- hydrology and system type, which covers:

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<sup>6</sup> See *On Efficiency and Effectiveness: Some Definitions* for a full treatment and definition of economic efficiency (PC 2013, p. 13).

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- the availability of water (for example, rainfall variability, groundwater level)
  - connectivity; that is, the number of users for whom trade is hydrologically feasible and the degree to which a system is primarily surface water, groundwater or an interconnected combination of both (known as conjunctive systems)
  - the presence of structures such as dams, weirs, and off takes that regulate flows and store water
- existing institutional, planning and property right arrangements (including seasonal allocation processes and enforceable access rights).

Economic factors will also influence the possibility for trade (Aither and DG Consulting 2018, pp. 5–6). These include:

- sufficient numbers of users and heterogeneous water use
- changes in other markets that lead to adjustments in the activities of businesses using or trading water (for example, a commodity price increase driving an increase in water demand).

For example, hydrologically connected systems and a heterogeneous range of water uses in the MDB — particularly in the southern MDB — have led to the region hosting the most advanced water market system in the world (Wheeler and Garrick 2020, p. 134). A range of sophisticated intra- and inter-jurisdictional arrangements have developed to support this system including the Murray-Darling Basin Agreement, the National Partnership Agreement on Implementing Water Reform in the Murray–Darling Basin and the Basin Plan, as well as state legislation.

In many systems in Australia, large volumes of trading will unlikely develop in the foreseeable future due to hydrological constraints, the size of the water system, its level of development or homogeneity of water uses that limit possibilities for trade.

Two supporting papers for this inquiry provide greater detail on the institutional pre-conditions, reflecting the structure of the NWI. The establishment of well-defined and enforceable water property rights is discussed in SP A *Entitlements and planning*. Secure water entitlements needed to support trading also require sustainable water management practices, which are discussed in SP C *Environment*.

## **2.2 Water markets have to be underpinned by fit-for-purpose institutions**

Australia’s experience with water markets since 2004 has demonstrated that appropriate management and institutional arrangements are required to ensure that markets function efficiently (box 1). Wheeler et al. noted:

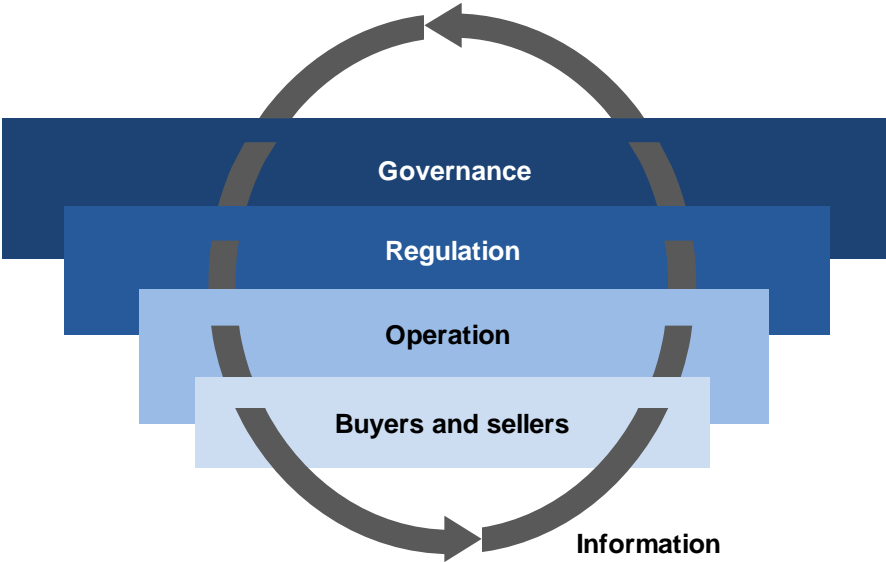
... decisions to allow ‘unfettered’ water trade prior to the reconfiguration of the administrative arrangements to adequately manage water supply and demand can be damaging to, rather than supportive of, water security. (2017, p. 809)

The complexity of water markets gives rise to risks of inefficient outcomes. Market structures can either facilitate or impede efficient trade, depending on their design and implementation (Teytelboym 2019, pp. 139–140). Leading practice governance, regulatory, operational and informational arrangements are key to ensuring water markets operate as efficiently as possible and are consistent with broader water resource management objectives. Wheeler et al. (2017, p. 812) used international comparisons of the Diamond Valley (United States), Guadalquivir Basin (Spain) and Tasmanian Irrigation regions (Australia) to highlight that, in addition to consideration of market pre-conditions, management regimes need to be ‘commensurate with potential market/trading activities’ to ensure efficient trading occurs.

Figure 2 illustrates the overlapping and interconnected layers of governance, regulatory and operational structures needed for water markets. For example, the operations involved in approving a trade between buyers and sellers of water are shaped by the trade rules and arrangements specified through regulation. Information connects these layers with each other and with the buyers and sellers who sit at the heart of a market. Information flows are as important to efficient market functioning as other more tangible structures or arrangements.

A number of layers make up the market structures, as illustrated in figure 2.

**Figure 2 Framework of market structures**



Source: Adapted from ACCC (2020, p. 395).

- Governance: the decision makers who shape the rules and processes for trade of water products and associated services; and the processes by which decisions are taken and the accountability mechanisms for those decisions (OECD 2015, p. 5).
- Regulation: the rules within which trade can occur and the processes by which these regulations are implemented. These rules: ensure transactions reflect hydrological

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constraints; ensure that third-party and environmental impacts are avoided; and grant access to market participants. Such regulations can include inter-valley trade limits, groundwater-specific trade restrictions, irrigation infrastructure operator rules and reporting requirements, among others.

- Operation: describes the arrangements that facilitate the buying and selling of water rights and related products.

Section 3 discusses the principles that should underpin these market structures.

### Water market structures in practice

While the principles discussed in the next section are desirable across jurisdictions and diverse water systems, how they are applied needs to be fit for purpose. The underlying characteristics of a system, and therefore potential benefits from trading, should be accounted for when determining the appropriate level of governance, regulation, operational arrangements or information.

The governance, regulation and operation of the MDB is highly sophisticated relative to other water management systems around the world. The costs of a complex regime (from well-resourced regulators, water registry services, trading rule enforcement, compliance activities, water market intermediaries and exchanges) are justified due to the large volumes of trade, the number of entitlement holders, the value of entitlements, the possibility of interstate trade (and associated regulatory differences), the water delivery distances (and managing associated water losses), the level of investment and the significance of environmental assets.

At the other extreme, water trading in its simplest form could involve two neighbouring farms, one with surplus water and another with insufficient water to maximise the value of their production opportunities. While foundational trading structures will be required, such as the definition of clear property rights and the capacity to measure take, the costs of developing more sophisticated market structures through regulations or other supporting measures are unlikely to be outweighed by the benefits of trade.

In certain systems, as noted above, the hydrological characteristics and homogeneity of water uses means that trade is unlikely to develop, regardless of the institutional arrangements.

Two case studies illustrate in more detail how market structures must suit the context of the system. The first example, the Gnamangara groundwater system in Western Australia, is an overallocated groundwater system with a diverse range of uses, but very little trade (box 2). The second, in Tasmania, is a system with relatively large volumes of available regulated and unregulated surface water which has growing volumes of trade (box 3).

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## Box 2 Water trade in the Gnamptara groundwater system

The Gnamptara groundwater system contains eight aquifers, some with connections to surface water sources. It provides almost half of the total water used in Perth and extends 90 km to the north of the Swan River, along the coast.

The diversity of industrial, agricultural and urban demands on the resource combined with the high rates of allocation would suggest a heterogeneity of use that would be conducive to water trading. Despite this, there have only been 789 trades in the past decade. (By comparison, there were more allocation trades than this per week during busy periods in the southern MDB in 2018-19). The primary reason for low trading rates is that the Gnamptara is a groundwater system. Groundwater systems have a number of characteristics that raise transaction costs relative to surface water systems, lower the pool of potential buyers and sellers and ultimately lower the possible gains from trade.

- Trade in such systems can have uncertain third-party impacts on water availability and quality.
- There are hydrological limits to trade between entitlements located within the same aquifers.
- The seasonal and spatial variability of rainfall in surface water systems can result in trade opportunities that are less prominent in groundwater systems, where users draw from a common pool that recharges at a slower rate.

Despite these hydrological challenges, institutional arrangements could be more trade-enabling. Time limited rights, ill-defined trading boundaries that do not reflect hydrological realities and sovereign risk from Ministerial discretion all weaken property rights or impose unnecessary transaction costs. Improving processing times would also lower transaction costs (*Assessment* section 2.4).

There may be a case for reform to these institutional impediments, provided the likely gains from trade outweigh the costs of changing governance, regulatory or operational settings.

*Sources:* Skurray et al. (2013, p. 1051; 2012, p. 262); BOM (2020b); DOW (WA) (2016, p. 22); DWER (WA) (2018, 2020); Wheeler et al. (2016, p. 513).

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## Box 3 Water trade in Tasmanian surface water

Tasmania has historically seen relatively low water trade, both in absolute volumes traded and as a share of total entitlements on issue. The primary reason for historically low trade volumes has been sufficient supply in most systems and irrigation schemes to meet demand through the issuing of new entitlements; meaning reallocation through trade has not been required.

While formal water trading outside irrigation schemes has been relatively infrequent, transfer of water through informal temporary water transfer and sharing between neighbouring entitlement holders on a seasonal basis is considered to be more common.

With clear property rights and low transaction costs to informal negotiation, individual trades can occur without significant institutional arrangements.

Today, some irrigation schemes are reaching full allocation, increasing the potential for trade. The Southern Highlands Irrigation Scheme, for example, is fully subscribed<sup>a</sup> and has had trading for the past three years.

<sup>a</sup> Equivalent to 'fully allocated' elsewhere in the text

*Sources:* BOM (2020b); DPIPW (Tas) (pers. comm., 9 September 2020); Tasmanian Irrigation (2019).



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### 3 Principles to guide future development of Australian water trading and markets

The NWI provides solid foundations for trading and markets through provisions covering secure property rights and sustainable extraction limits set through planning. The intent of the objectives relating to markets and trading also remain relevant (box 4).

**Box 4 NWI paragraph 58**

The States and Territories agree that their water market and trading arrangements will:

1. facilitate the operation of efficient water markets and the opportunities for trading, within and between States and Territories, where water systems are physically shared or hydrologic connections and water supply considerations will permit water trading;
2. minimise transaction costs on water trades through good information flows in the market and compatible entitlement, registry, regulatory and other arrangements across jurisdictions;
3. enable the appropriate mix of water products to develop based on access entitlements, delivery and storage capacity which can be traded either in whole or in part, and either temporarily or permanently, or through lease arrangements or other trading options that may evolve over time;
4. recognise and protect the needs of the environment;
5. provide appropriate protection of third-party interests.

This section identifies leading practice and principles that can guide a renewed NWI. Before heading into the detail, one overarching principle is noted: a renewed NWI should emphasise that the purpose of water trading and markets is to increase efficiency within a water resource management framework. Water trading and markets are not ends in themselves.

#### 3.1 Creating the foundations for leading practice arrangements

Governance — who sets the rules and how

*Roles and responsibilities of key parties should be clearly defined and their activities coordinated*

Core roles within water market governance include policy design and implementation, regulation and operational management. With the exception of the MDB, States and Territories and their bureaucracies perform the majority of market governance functions. Governance within the MDB is shared between MDB jurisdictions and the Murray–Darling Basin Authority (MDBA). Under the *Water Act 2007* (Cth) and Basin Plan, the MDBA develops and enforces water trading rules as well as operates the River Murray system under the Murray–Darling Basin Agreement (ACCC 2020, p. 491). The Australian Government

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also plays a prominent role as a market participant through the Commonwealth Environmental Water Office (CEWO) (SP C *Environment*).

In many systems, including the MDB, overlapping, conflicting or fragmented governance roles have developed (ACCC 2020, p. 490). The multiple and possibly conflicting roles of the MDBA, as an agent of government and a regulator, has been recognised (ACCC 2020, p. 491; PC 2018). The ACCC (2020, p. 491) also recognised that:

Irrigation infrastructure operators operate trading platforms and/or offer brokerage services, while acting as a trade approval authority. This puts them in a position where they could prioritise the approval of trades facilitated by their own brokers or trading platforms over other trade approval requests.

The provision of trade and market information is an area that illustrates the potential benefits of better defined governance roles. Victoria's dedicated Water Registrar has a statutory requirement to provide accurate and reliable records of ownership of water entitlements and allocations, improving market confidence and efficiency (DELWP (Vic) 2019b, p. 12). The ACCC has recognised Victoria's water register and market information arrangements as best practice (2021, p. 315).

Effective water market governance also ensures that relevant parties' activities are coordinated effectively. Coordination may need to span a number of dimensions, including between authorities within the water sector, jurisdictions, scales (for example, water infrastructure, system and catchment), and adjacent sectors (for example, environment, agriculture and health) (OECD 2015, p. 9). Coordination can ensure that water trading and market tools remain effective within a water resource management framework.

#### *Activity in markets should be monitored and evaluated*

A responsive governance regime that is conscious of developments and responds proactively can improve the efficiency of a system. Regular monitoring, evaluation and subsequent responses to changes in trading patterns and levels of market development ensure that institutional arrangements remain fit for purpose (*Report*: chapter 5). Changes in water availability and economic factors, as well as new information about system hydrology and environmental conditions, will influence demand for water trading, potentially warranting improvements in governance arrangements.

Tasmania, for example, has a state-wide water trading policy, but, in line with a fit-for-purpose approach, tailors its market arrangements to the level of trading demand in water systems. As irrigated agriculture has developed and trading has gradually increased, the Department of Primary Industries, Parks, Water and Environment has been monitoring water systems to identify opportunities to better support water trading (DPIPWE (Tas) 2020, p. 24).

Queensland also has a process to respond to the needs of market participants and tailor market structures accordingly (*Assessment*) — the then Department of Natural Resources,

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Mines and Energy has consulted with industry stakeholders through an Underutilised Water Partnership Project.

Public confidence in market functioning is also an important governance consideration, particularly in sophisticated water markets. As noted in section 1.2, it affects market participation and, in turn, transaction costs. Market confidence can be supported through regular and transparent evaluation and monitoring. Responsiveness to evaluation findings when markets could be improved is also required. Public confidence and integrity relate to a number of water management areas and are discussed further in (SP E *Integrity*).

*Water trade monitoring should be integrated into water system management in sophisticated systems*

There have been significant changes in water market dynamics in many systems since 2004. While the NWI explicitly recognises and protects the environment and third-party interests, greater trade has seen issues emerge in the MDB (PC 2018, p. 261). Examples of third-party impacts have included increased risks of delivery shortfalls and unintended unseasonal flows and erosion caused by poorly coordinated movements of regulated surface water (Murray Irrigation, sub. 69, p. 8; SRI, sub. 77, p. 9; MVPD, sub. 101, p. 2). Reduced channel capacity in the Barmah Choke, and increased frequency and peaks in demand at more concentrated downstream locations highlight the need for longer-term monitoring of water trade and its interactions with MDB system constraints (ACCC 2021, pp. 415–416).

For most systems and most trades, existing arrangements to monitor water trading and markets (box 5) provide appropriate protections against these impacts. The monitoring of individual water trades, at a short-term operational level, is reasonably well managed. Trade approval authorities ensure that individual trades are consistent with environmental and third-party interests. Planning by system operators, often on a seasonal basis, ensures that water is able to be delivered to all users, taking into account trades that have occurred, any locational changes in access points and operational considerations that are necessary to limit environmental and third party impacts. The MDB shows however, that while existing arrangements provide appropriate protections most of the time, there may also be a need for longer-term monitoring of the cumulative effects of increasing trade volumes within system constraints, particularly in the face of changing land use and greater climatic variability.

Proactive monitoring of water trading (particularly long-term market dynamics) and its interaction with resource availability and system constraints may fill a gap in monitoring in highly developed systems. As the operator of the River Murray system, the MDBA, in cooperation with other system managers (such as Goulburn Water, WaterNSW, and DELWP), has increasingly been performing this role (DELWP (Vic) 2018b). In other systems, however, no entity is responsible for monitoring the interaction of water trade with the broader tasks of long-term water resource management and system operation. While delivery risk is the responsibility of system managers, their objective is to manage short-term competing demands on their constrained infrastructure.

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## Box 5 Existing monitoring and oversight roles

There are several entities that perform water trading and market monitoring and oversight regulatory functions:

- State government water policy departments
- the Murray-Darling Basin Authority, which monitors and oversees the operation of the River Murray system on behalf of New South Wales, Victoria and South Australia
- the Victorian Water Grid Partnership, which brings together 19 water corporations, 10 catchment management authorities and the Victorian Environmental Water Holder to provide a state-wide oversight function of grid operations, including of water trade and markets
- the Australian Competition and Consumer Commission and the Independent Pricing and Regulatory Tribunal (NSW), which monitors market participant behaviour in the Murray–Darling Basin
- the Interim Inspector–General of Water Compliance (AG) and the Natural Resources Access Regulator (NSW), who monitor compliance and enforcement of resource use
- the Productivity Commission, which monitors and assesses water market reform implementation against the National Water Initiative and Basin Plan commitments.

Sources: ACCC (2020, pp. 415, 487); DELWP (Vic) (2018a).

To address this gap, the Commission suggests jurisdictions consider establishing an explicit monitoring function, particularly in systems that are approaching fully- or over-allocated status. Such a function would take a broader and longer-term, system-level view of water trade and operational risk within the context of the water management system. It would consider the interaction between resource availability, system constraints and water trade that may otherwise go unidentified. More specifically, in performing this function, jurisdictions would:

- proactively anticipate, identify and advise on responses to emerging risks in the context of third party and environmental impacts of trading
- provide transparent reporting
- coordinate with relevant governance bodies in supporting trade.

Monitoring and advising on emerging risks, they would then also consider whether further regulatory action, such as recommending the introduction or alteration of trade rules, is required to protect third parties and the environment. Information from this longer-term monitoring would also aim to support the performance and effectiveness of system managers (SP E *Integrity*). The processes and advice provided through this function must be transparent, rigorous and deliberate to ensure that findings do not create unnecessary market uncertainty and impinge on confidence. Given the challenges posed by a changing climate, this function will become increasingly important. The role, in jurisdictions where it would be required, aligns with resource management and could be undertaken by existing agencies.

As part of a comprehensive reform package, the ACCC (2021, p. 40) has recommended that the Australian and Basin State governments create an ‘independent Basin-wide Water

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Markets Agency to consolidate and carry out new and existing trade-related roles and functions'. Among the range of functions to be performed by this agency, the market surveillance and evaluation functions are most similar to those described here. The implementation of these functions, however, are described in a way that is MDB-specific and reflects the other recommendations made by the ACCC (2021, pp. 555–562). In principle, however, the recommendation is supportive of the need for water trade monitoring to be better integrated with water resource management.

FINDING 7.1

The Murray-Darling Basin demonstrates that, in highly developed systems, water trade monitoring ought to be integrated into system-level resource management. By taking a broader and longer-term system-level view of water trade and operational risk within the water resource management context, jurisdictions can more proactively anticipate and identify emerging issues and be advised on regulatory responses where warranted.

## Regulation — the rules and their administration

Water trade regulation describes the rules within which trade can occur and the processes by which these regulations are implemented. A key objective of the NWI is the 'progressive removal of barriers to trade in water', which has been largely achieved (PC 2017, p. 118).<sup>7</sup> However, rules are warranted where trade results in negative impacts on other water users and the environment. In cases like these, restrictions may be required in order to maximise overall community benefits (Chong and Sunding 2006, p. 251).<sup>8</sup> Leading practice has a number of characteristics.

### *Regulation should protect third-party interests, appropriately defined*

When two parties choose to trade water, there are mutual benefits accruing to buyer and seller. A market failure occurs where this mutually beneficial choice results in an impact on others that is not compensated by the parties to the trade.

Where possible, regulations should protect against identifiable negative impacts (externalities) of trading (both of individual trades and the cumulative effects of trading). Identifiable impacts of water trades on other water users and the environment can include increases in conveyance losses (for example, evaporation and spillage during delivery), pumping impacts on water quality (in groundwater systems) and unseasonal flooding in constrained river segments.

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<sup>7</sup> NWI paragraph 23(v).

<sup>8</sup> Noting that this maximisation problem will necessarily consider both benefits and costs that arise from trade restrictions. The use of 'community' in this context refers to whole of society outcomes.

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In most systems, third-party protections are provided by trade rules and approval processes. As a broad principle, however, pricing and other regulatory measures that seek to internalise the negative impacts of individual trades can provide greater community benefits than untargeted, rules-based trade restrictions. Inquiry participants called for pricing of delivery losses — through the use of loss factors — to improve the efficiency of water delivery (CICL, sub. 7, p. 7; MVPD, sub. 101, p. 6). The St George Water Scheme in Queensland provides an example of this approach. But the complexity of the southern MDB system means that the benefits of a loss factor approach are unlikely to outweigh the costs of implementation (ACCC 2021, p. 541).

Inquiry participants have also commented on socioeconomic third-party effects of increased trade (AgForce, sub. 24, p. 5; SunRice and RGA, sub. 82, p. 3). Socioeconomic impacts of water reform more broadly are considered through the adjustment provisions of the NWI (chapter 13).

*The boundaries of trade should facilitate trade within hydrological and environmental constraints*

Trade between locations, whether between states and territories, valleys, or management zones, should not be limited by artificial administrative impediments, but should reflect hydrological and environmental constraints. A fit-for-purpose trading system should reflect hydrological characteristics of surface water and groundwater systems (and their interconnectedness) (NRMSC 2002, p. iv). In some cases, the spatial regulation of intrastate trade (particularly in groundwater systems) acts as a barrier to trade. This occurs when geographic trading zones are drawn from historical administrative boundaries, often associated with boundaries of land titles, rather than being based on hydrological considerations (Skurray, Pandit and Pannell 2013, p. 1051).

In other cases, such as in the MDB, increased volumes and changed patterns of trading may require consideration of changes to boundaries to better reflect hydrological constraints. The ACCC (2020, p. 527) has recommended that Basin States ‘together with the MDBA, should assess the appropriateness of the current set of, and spatial definitions of, geographical units used in water management and river operations as the basis of trading zones’.

No interstate trade currently occurs outside of the MDB (BOM 2020b), and there is neither the demand nor hydrological connectivity that would support this taking place in other transboundary systems in the near future. Nevertheless, if interstate trade were to develop in the Great Artesian Basin or the Lake Eyre Basin, any administrative incompatibility and inconsistency between regulatory systems should be removed to facilitate trade. Within the MDB, the continued lack of interstate trade between New South Wales and the ACT is a clear demonstration of where regulatory inconsistency prevents trading (*Assessment*).

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*Rule changes, allocation decisions and drivers of water availability should be transparent*

Where the changing of trading rules is necessary and well-justified, the communication of these changes should be clear, timely and accessible to market participants. There has been evidence that better resourced participants have been able to take advantage of ‘first come, first served’ trade limit rules, to the detriment of less informed participants (ACCC 2020, p. 19). For significant rule changes, such as changes to inter-valley transfer limits, community engagement will be necessary in the development of changes. The regulatory impact assessment and consultation process that has been conducted by Victoria into the Goulburn to Murray trade rule review is an example of best practice (*Assessment*).

In the MDB, an explicit (and published) decision framework for the assessment of trade restrictions is also desirable to provide transparency around the adoption or removal of trade restrictions (PC 2018, p. 48). The MDBA Water Trade Restriction Assessment Framework has been developed and is currently being piloted (*Assessment*). It has identified over 1500 surface water trade restrictions that may need to be reviewed to ensure they meet the Basin Plan requirements (MDBA 2020, p. 3). Transparency around the decision-making process for rule changes provides certainty to market participants and similar decision frameworks may have applicability outside of the MDB.

Beyond trade rules, administrative processes and decisions that affect water availability, and therefore market dynamics, would benefit from increased transparency. Examples of these processes include seasonal announcements around water allocations, information on carryover policies, reporting on conveyance losses and delivery impacts among others. The Basin Plan Water Trading Rules currently include a trigger for Commonwealth and Basin State announcements to be made ‘generally available’ where they would be considered to have a ‘material effect on the price or value of water access rights’.<sup>9</sup> The ACCC is proposing broadening the scope of this trigger in the MDB to cover announcements more generally, including by non-government entities (ACCC 2020, pp. 31, 355). While other markets may not be sufficiently developed to warrant a similarly sophisticated trigger arrangement, the impact of, and transparency around, non-market administrative processes and decisions should be considered.

*Market access should be protected for all participants*

Although technically a form of trade restriction, market access warrants separate treatment because it impacts other dimensions of market functioning, like market composition, in addition to permitting or preventing individual trades.

The MDB has experienced a significant increase in the diversity of market participants as more brokers, domestic and foreign investors and other non-user participants have entered the water market. Some inquiry participants (as well as participants to other inquiries) have argued that the access of certain participants, particularly non-users such as participants from

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<sup>9</sup> Basin Plan, 2012 (Cth), s12.49.

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the financial services sector, should be restricted because their involvement reduces the volume available for use and drive up the price (ACCC 2021, pp. 276–278; DPIPWE (Tas) 2020, p. 24; RAMJO, sub. 28, attachment, p. 2; PIAC, sub. DR156, p. 7).

The Commission shares the conclusion reached by the ACCC that, while there may be a case for increased regulation of certain market behaviours, particularly by market intermediaries, this should not preclude entire groups from participating in water markets (ACCC 2021, p. 278). These participants offer several benefits, particularly in increasing market depth (the numbers of buyers and sellers), reducing transaction costs and providing a risk management function.

A goal of the NWI was for states and territories to enable a diversity of water market products to develop. Broad market access — particularly for investors and other financial sector participants — provides a more diverse source of demand for a wider range of products. In particular, such financial sector market participants provide capital, expertise and increase the diversity of market demand, that make products like forwards and options more likely to develop. Government regulation has a role to play in ensuring market access to a diversity of water users and non-users as a way to ensure that these products are available.

This pattern of increased market entry of non-users can be expected to occur in other water systems as trading develops further. To pre-empt these developments, a renewed NWI should enshrine principles of market access. While the NWI does not include non-discriminatory market participant clauses, subsequent reform, namely the Basin Plan, has codified the concept.<sup>10</sup>

Limits to inter-sectoral trade represent another potential barrier to market access for certain participants. Various state governments continue to provide implicit or explicit direction to water utilities not to purchase or transfer rural water for urban use (effectively placing a policy ban on this supply option) (*Assessment*). There is currently limited trade involving businesses in the mining sector (MCA, sub. 102, p 3). As jurisdictions integrate these other sectors into their entitlements and planning systems, the opportunities for trading may increase (*SP A Entitlements and planning*). Going forward, their participation in water markets should not be impeded due to their industry.

### Operation — how trades happen

The operations relating to water trading can be described by a range of trade-related services, which give effect to agreements between buyers and sellers (figure 2). These include:

- trade approval fees and timing
- regulation of trade-related services such as advisory, matching, clearing and settlement.

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<sup>10</sup> Basin Plan Chapter 12, Section 7 and 8.



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Both can affect the efficiency of markets by imposing unnecessary transaction costs on market participants.

*Market operation should seek to optimise transaction costs*

Trades require some approval processing to ensure they are consistent with hydrological constraints, the protection of third parties and the environment. A set of minimum operational tasks that are required to give effect to efficient water trades, was provided by the Natural Resource Management Standing Committee (2002, paragraph 29):

- seller checks (including on existing native title and potential impacts) on the title to water, availability, delivery capacity and third party interests;
- buyer checks (including on existing native title and potential impacts) on delivery capacity, site use and compliance with relevant environmental criteria and management plans;
- adequate assurance to potential traders that agreements for payment and timely transfer of the water will be honoured; and
- minimum standard documentation that sets out the obligations of buyers and sellers.

While trade approval processes are conducted by a government approval authority for most trades, irrigation infrastructure operators are responsible for trade approvals within, into or out of their systems.

In all systems, the procedures above should be implemented in a way that is fit for purpose. For example, where trades have a low risk of affecting third-party entitlement holders or the environment, the checks of buyers and sellers can be proportionately simplified. Nevertheless, these processes will always be required to ensure that entitlement holders are operating within their obligations and system rules (*SP E Integrity*).

*Approval fees*

Approval authorities impose charges on trade applications to recover the cost of processing.<sup>11</sup> Approval fees should be set at the cost of efficiently delivering approval services. There are disparities in processing costs across jurisdictions due to the different technologies used. However, even if these technologies were similar, there would still be some variation in costs due to the number of trades processed in each jurisdiction. A higher number of trades generally lowers the average cost per trade.

Although there has been some research on the impact of approval fees on trade within the MDB (ACCC 2021; Loch, Wheeler and Setre 2018), the evidence is limited for the rest of Australia. The ACCC (2020, p. 300) found that high trade approval fees alone do not significantly impact the volumes (in GL) of individual trades. States with higher approval fees had similar rates of low volume trades relative to states with lower approval fees. At the

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<sup>11</sup> NWI paragraph 64(iv).

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margin, however, higher approval fees will increase transaction costs, lowering the gains from trade. Effective pricing oversight is needed to ensure that efficient cost recovery occurs (*Assessment*), and that approval fees are not imposing unnecessary transaction costs.

### *Processing times*

The impact of approval processes in deterring trade can also occur through non-monetary transaction costs, such as processing times. A risk-based approach is often applied to processing, where more complex trades that have a higher likelihood of negative externalities are subject to greater approval scrutiny and therefore lengthier processing times. The technology used in processing is another driver of processing times, with Victoria's digital processing platform bringing most trades down to same day processing.

Some jurisdictions have implemented service standards and targets to minimise processing times. MDB jurisdictions are the only jurisdictions that have committed to statutory service standards for processing times, under a COAG agreement. In 2017, the Commission found that trade approval processing times in the MDB had generally improved over the years (PC 2017, p. 387). However, despite numerous recommendations to do so, service standards have not been reviewed (ACCC 2010; PC 2017, p. 30). The ACCC has recommended mandatory trade approval service standards be instituted in the MDB (ACCC 2020, p. 30). There are also requests from market participants to harmonise and reduce time to process approvals (ACCC 2020, p. 293).

Outside of the MDB, Western Australia and South Australia have nominal processing time targets. Tasmania and the ACT do not set targets, but monitor the performance of their processing times. In jurisdictions with low volumes of trade, the benefits from shorter processing times may not be sufficient to justify complex service standard regimes. A lower level of performance monitoring, as in Tasmania and the ACT, is fit for purpose in their context (*Assessment*).

### *Trade-related services and regulation*

Trade-related services provided by third parties can help to lower transaction costs for buyers and sellers of water. Exchanges, brokers and other water market intermediaries can assist sellers in finding appropriate buyers for their entitlements, lower the costs of compliance and provide tailored information to participants.

Increased regulation of these services, which can raise costs and/or lower their availability, would have the indirect effect of increasing transaction costs for market participants. These costs must be balanced against the possible market failures that can arise from insufficient regulation of behaviour of these service providers, such as conflicts of interest and asymmetric information.

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In the MDB, water market intermediary services play a prominent role in facilitating water trade. The most recently available data, from 2015, suggest that 82 per cent of irrigators used an intermediary to trade (Wheeler et al. 2020, p. 116). The ACCC (2020, p. 26) has concluded that there is insufficient regulation of water brokers and other water market intermediaries in the Basin. The existing self-regulation arrangements have not been effective. The ACCC has recommended that legislative changes by Basin States and the Australian Government include an enforceable mandatory code for the industry. Further regulations on price reporting and limits on market misconduct among other market participants (including intermediaries) are also recommended to be monitored and enforced by a MDB-wide regulator — the Water Market Agency (box 1).

As trade-related services are increasingly provided in systems outside of the MDB, their regulation should account for whether indirect increases to transaction costs for buyers and sellers are greater than the benefits likely to be gained from the regulation (for example, greater customer protections and lower rates of market misconduct by brokers).

### Information provision — roles and responsibilities

The efficient functioning of the three suites of market arrangements — governance, regulation and operation — all depend on adequate information flows (figure 2).

In some markets a lack of information is cited as a significant barrier to more active trading (for example, TasWater, sub. 11, p. 5). Trade information remains inadequately or insufficiently provided by jurisdictions. For example:

- there is a lack of transparent price data
- trade rule changes and other regulatory announcements are made available to users in an inconsistent manner
- the reasons for trades are not typically recorded or reported (such as environmental trades)
- irrigation infrastructure operator internal trades (such as within irrigation districts) are not required to be reported, meaning that the registers show an incomplete picture of trading.

Facilitating ‘good information flows’ to minimise transaction costs remains relevant to a renewed NWI.<sup>12</sup> Water registers, provided by State and Territory Governments, are the foundation of these information flows, as a transparent record of water right ownership and trades. Beyond water registers, the public and private sector each have roles to play in collating and communicating market relevant information to meet different user needs.

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<sup>12</sup> NWI paragraph 58(ii).

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*Water registers are critical in defining water ownership and provide basic trade data*

Under the NWI, jurisdictions agreed to implement ‘compatible, publicly-accessible and reliable’ water registers.<sup>13</sup> The water register guidelines (schedule F) of the NWI remain relevant. This means that registers should capture all water access entitlements and their trades, along with their location, price, and identity of entitlement holders.

Victoria, South Australia and the Northern Territory have made significant progress in improving their water registers since 2017. Queensland has made progress in improving access to its water market information, however, its water registers still do not meet all NWI guidelines (*Assessment*). New South Wales has undertaken stakeholder consultations on its water registers and possible reforms to increase transparency (DPIE (NSW) 2021). Inquiry participants are divided on whether water registers meet user needs. In the view of NSW Irrigators’ Council (sub. 27, p 19), other than regarding compatibility between states, ‘the National Water Initiative requirements are largely satisfied’ given the current information available on NSW water registers. In contrast, the Southern Riverina Irrigators (sub. 77, p. 9) argued that water registers are currently ‘grossly inadequate’.

While the characteristics of ‘publicly-accessible’ and ‘reliable’ should be retained for all water registers under a renewed NWI, the characteristic of ‘compatible’ is only necessary where interstate trading is likely to occur (currently only the MDB).

In line with lowering transaction costs, water market information provided by jurisdictions should also aim to be timely (NIC, sub. 27, p. 19). Improving processing times will have the dual benefit of lowering transaction costs and improving the timeliness of trade information reaching the rest of the market.

Guidance around publication of information should be modernised. In particular, the publication of entitlement holder identities should balance transparency and integrity considerations with privacy concerns (DELWP (Vic) 2019a; NIC, sub. 27, p. 19). The ACCC has formed the view that ownership information is not required for market efficiency and that its publication may lead to perverse outcomes (ACCC 2020, p. 347). To the extent that transparency supports market confidence and efficiency, jurisdictions could consider improving the accessibility of ownership information, while balancing this against privacy concerns. Victoria, for example, has published a Largest Water Owners webpage (*Assessment*).

A renewed NWI should continue to provide principles and guidelines on water registers to support jurisdictions’ decision making about the collection and provision of basic entitlements and trade data. At a minimum, basic trade information, including prices, volumes, dates, locations and product types, should be publicly available. In some systems, government provided water registers may play a role in communicating this information, but need not be the only mode of doing so (*Assessment*). Jurisdictions, in consultation with their market participants, may choose to capture, organise and communicate this information in different ways to suit their contexts. Government provision of basic trade data beyond

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<sup>13</sup> NWI paragraph 59.

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registers should be guided by user needs and by a consideration of the benefits and costs related to government provision of that information (relative to private provision).

Water registers also support a range of other water management objectives, which are discussed in SP E *Integrity*.

In addition to these water register arrangements, the Australian Taxation Office currently administers the Register of Foreign Ownership of Water Entitlements. The effectiveness, costs and benefits of this register are currently being examined separately by the Productivity Commission as part of a concurrent inquiry (PC 2021).

### *Beyond registers, governments' role in ensuring information flows should be clear*

Governments have a clear role providing non-trade information that supports trading. As discussed in the regulation section, information around market rules needs to be provided by government. This should include not just their content, but also a transparent rationale for their imposition. Information on water resource quality and accessibility is another area where government has a role in provision (SP E *Integrity*).

Well-informed market participants are necessary for well-functioning markets (Teytelboym 2019, p. 141). Evidence from the MDB suggests that the effectiveness of government-provided information services on water markets and resources could be improved. That aspects of the MDB water markets, such as the relationship between carryover policy settings and water supply, are ‘not well understood by users’ was a common theme in submissions and consultations by the ACCC (2020, p. 24). Improving water literacy — particularly among new water market participants — may require government involvement (Aither and DG Consulting 2018, p. 14; IIGMDB 2020, pp. 41–42; SP E *Integrity*: section 5.2). Educational information that supports transparency and minimum levels of understanding among participants about market risks may have been underprovided in the MDB. As water trade and markets grow in other water systems, the effectiveness of government-provided information should be monitored and improved where necessary.

Private providers are often able to lower transaction costs to market participants by providing tailored information. For this kind of user-specific information, private providers are, in general, more efficient than government. Furthermore, the benefits of tailored information generally accrue privately to market participants, weakening the case for government to expend public resources providing it. Several brokers and exchanges are now providing these services in regions outside the MDB, in Queensland and in groundwater systems in South Australia.

## **4 NWI renewal advice**

National water reform has progressed significantly since the NWI was agreed in 2004. For water trade and markets, the unbundling of property rights, capping of consumptive extractions, and improvements in the efficiency of trade rules have seen trade grow substantially.

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Almost all of this growth has occurred in the MDB, a region with pre-conditions that are particularly well suited to market development. Subsequently, the importance of the MDB water markets, and the unique challenges that these systems face, has warranted the development of MDB-specific institutional arrangements, beyond the NWI. The *Water Act 2007* (Cth) and Basin Plan are now the primary inter-governmental legislative arrangements that govern trade in the MDB. A renewed NWI will not be the policy lead in the MDB. After almost 30 years of trade, the ACCC MDB Water Markets Inquiry will provide advice on improvements to MDB arrangements.

There is broad-based support for a renewed NWI that continues to support the development of water trading across Australia. The development of northern Australia, particularly in agriculture, has been recognised as an area where secure water rights could enable the future development of trading (IA 2016, p. 114).

The NWI provides solid foundations for trading and markets through provisions covering secure property rights and sustainable extraction limits set through planning. And the intent of the key outcome relating to trading and markets should be retained — arrangements should facilitate the efficient operation of markets, where system and water supply considerations permit. The current NWI also establishes other outcomes for water trading: to minimise unnecessary transaction costs through good information flows; enable the development of an appropriate mix of products; recognise and protect the needs of the environment; and provide appropriate protection for third-party interests.

But a more detailed set of principles building on this foundation would better underpin the development of trading and markets in other parts of the country — and build on the lessons from the review of 30 years of trading in the MDB. To the extent that the NWI targeted actions towards facilitating trade in the MDB, a broader focus can now be taken which builds on the experience of the MDB and recognises the diversity of water systems in Australia and their relative market readiness. Growing water scarcity and variability due to climate change and population growth mean that water trading has an important role in providing a low cost approach to reallocation.

#### NWI RENEWAL ADVICE 7.1: THE ROLE AND APPLICATION OF WATER TRADING AND MARKETS

A renewed National Water Initiative should emphasise that the purpose of water trading and markets is as a tool within a water resource management framework to increase efficiency.

There is no guaranteed supply of water by location, time and quality. For given users, and trade-offs in the values people place on availability, markets can play an important role in allocating water efficiently.

The diversity of water system hydrology — regulated and unregulated surface water, groundwater and conjunctive (surface and groundwater) systems — coupled with other economic and institutional pre-conditions mean that the establishment of market arrangements need to suit their context. They need to be fit for purpose.

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Leading practice market arrangements are needed to ensure fit-for-purpose implementation.

NWI RENEWAL ADVICE 7.2: LEADING PRACTICE GOVERNANCE, REGULATORY AND OPERATIONAL ARRANGEMENTS

Recommitting to the original National Water Initiative water trading and market principles would support the objective that arrangements facilitate the efficient operation of markets, where system and water supply considerations permit.

Reshaped principles covering governance, regulatory and operational arrangements for water markets and trading would provide stronger foundations for developing markets.

- Roles and responsibilities of key parties involved in governance are clearly defined, and the parties' activities are effectively coordinated.
- Institutional arrangements are monitored and evaluated to ensure they remain in step with the level of a market's development.
- Trade is regulated to maximise overall community benefit (efficiency).
  - Arrangements protect against negative third party impacts of water trades on other water users and the environment.
  - The boundaries of water markets should be shaped by hydrology; trade between locations or sectors should not be limited by artificial administrative impediments.
  - Regulatory consistency and compatibility apply where it is hydrologically feasible for interstate trade to occur.
  - Where the changing of trading rules is necessary and well justified, the communication of these changes should be clear, timely and accessible to the market.
  - Where broader management and administrative decisions (such as processes for determining seasonal allocations) impact on water availability and therefore market dynamics, these processes should be transparent and their impacts well understood.
- Market access is open to all participants.
  - Development of an appropriate mix of tradeable water products is enabled.
- Water market operations optimise transaction costs, including both monetary (for example, trade approval fees) and non-monetary (for example, from trade approval processing times and regulation of trade related services).

Jurisdictions could also consider integrating water trade monitoring with system management in highly developed systems. Such a role could focus on the long-term operation of the market within the water resource management system. In a changing climate, shared resources and connected systems will require consideration of the interaction between resource availability, system constraints and water trade; and the identification of risks as these interactions change.

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Supporting market structures, information is a central component to the efficient functioning of water markets in all systems.

#### NWI RENEWAL ADVICE 7.3: INFORMATION TO SUPPORT EFFICIENT WATER MARKETS

In efficient water markets:

- registers of all water access entitlements and trades are publicly accessible, timely and reliable
- basic trade data — including on prices (clearly specifying reasons for zero price trades), volumes, dates, locations and product types — are publicly available
- publicly-provided non-trade information covers market rules and the quality and accessibility of water resources.

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