Water Markets

Australia's journey and experience

Addressing water scarcity in Iran: WaterGuide dialogue

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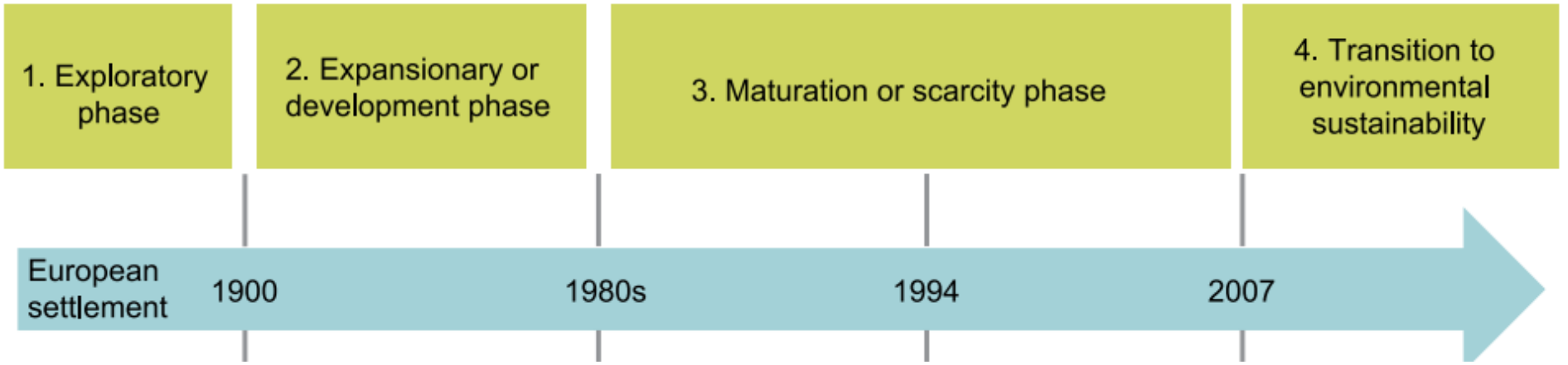
Overview

- Evolution in Australia's approach to water management
- Why water markets?
- Reforms implemented to support and develop markets
- Results and performance of markets to date
- Lessons and insights for new / developing markets

Evolution in water management

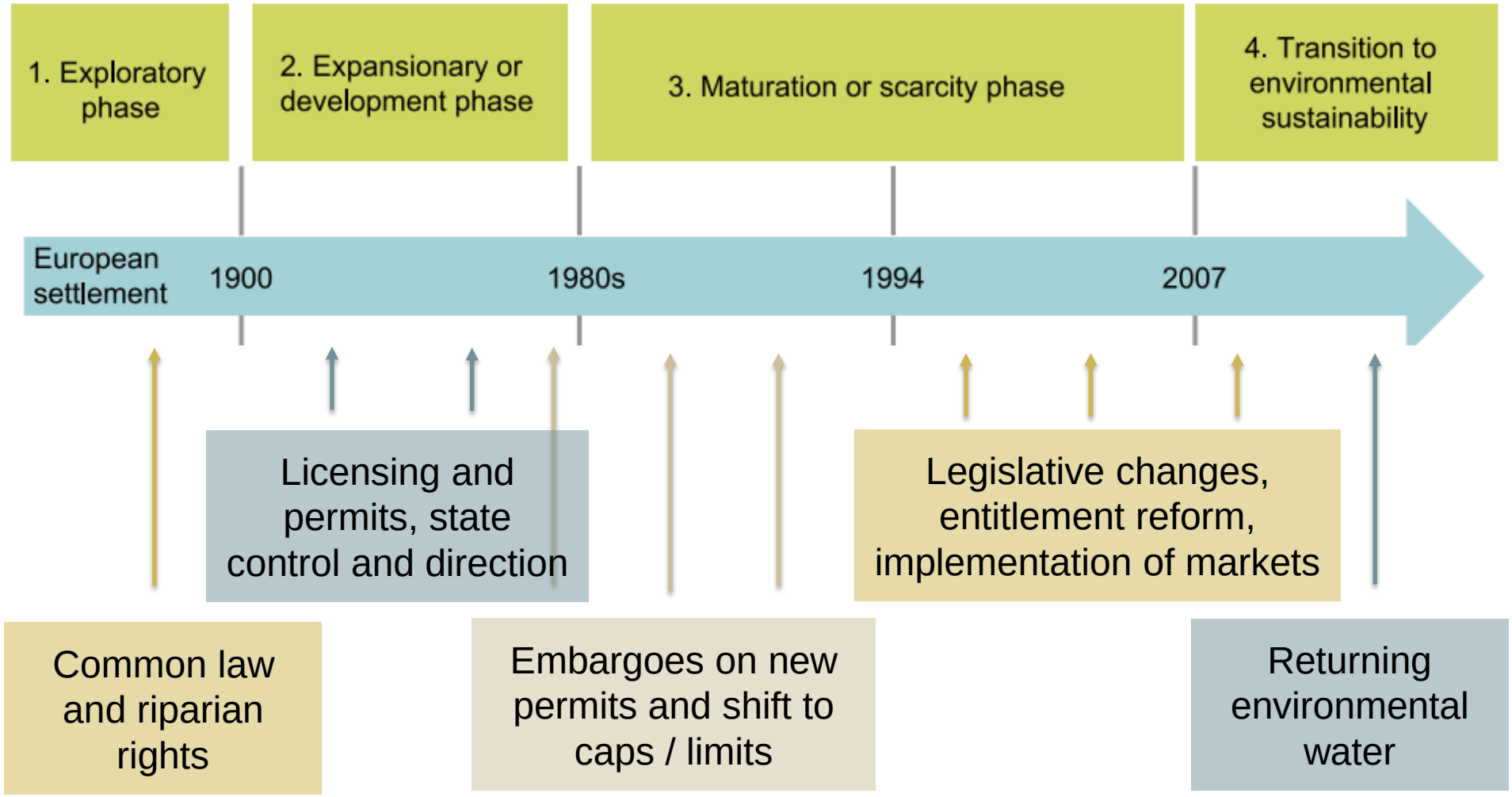
From early development to implementation of water markets

Development of Australia's water resources

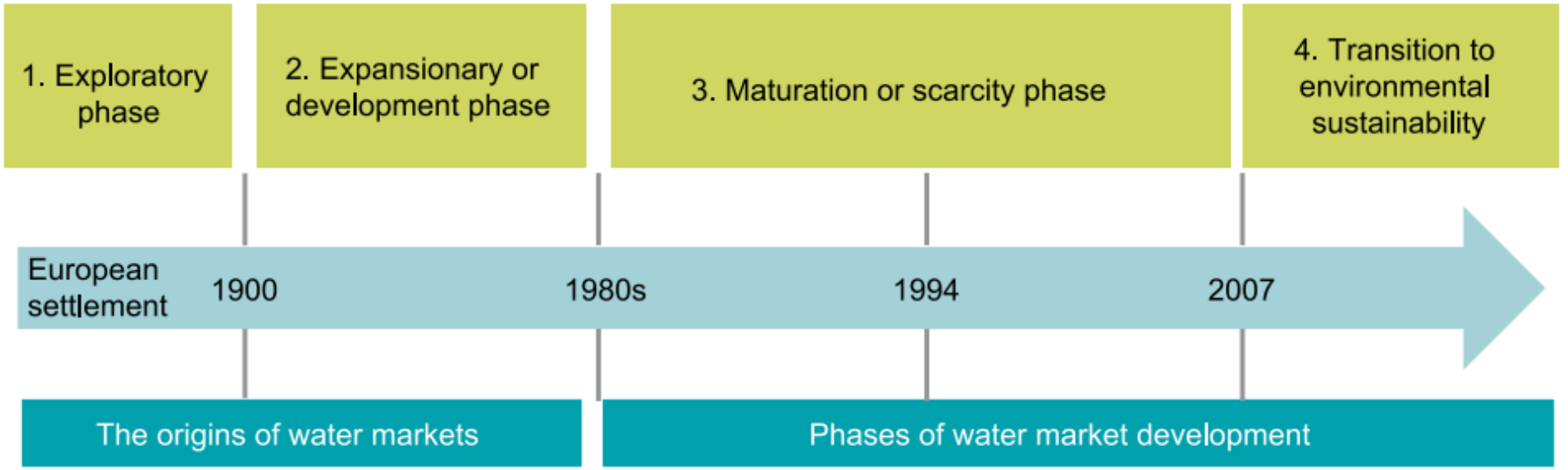


- Early settler development
  - Maximise water use, promote small farms
- Infrastructure expansion
  - Major government investment
  - Settlement schemes promoted small block irrigation
- Limits to development
  - Scarcity, overallocation, limits to funding, efficiency concerns
- Transition to more sustainable approach
  - Refinement and implementation of reforms, increased focus on environment

Changes in management approaches



Implementation of water markets over time



Some very early informal examples during droughts

Some trade, often 'temporary' trade, legislation limits, water still tied to land

Pilots for entitlement and inter boundary/state trade, some legislative changes but trade still constrained

Major legislative changes, entitlement reform, extensive implementation across MDB

Return enviro. water

Why water markets?

What they respond to and key objectives

Water management challenges faced by Australia

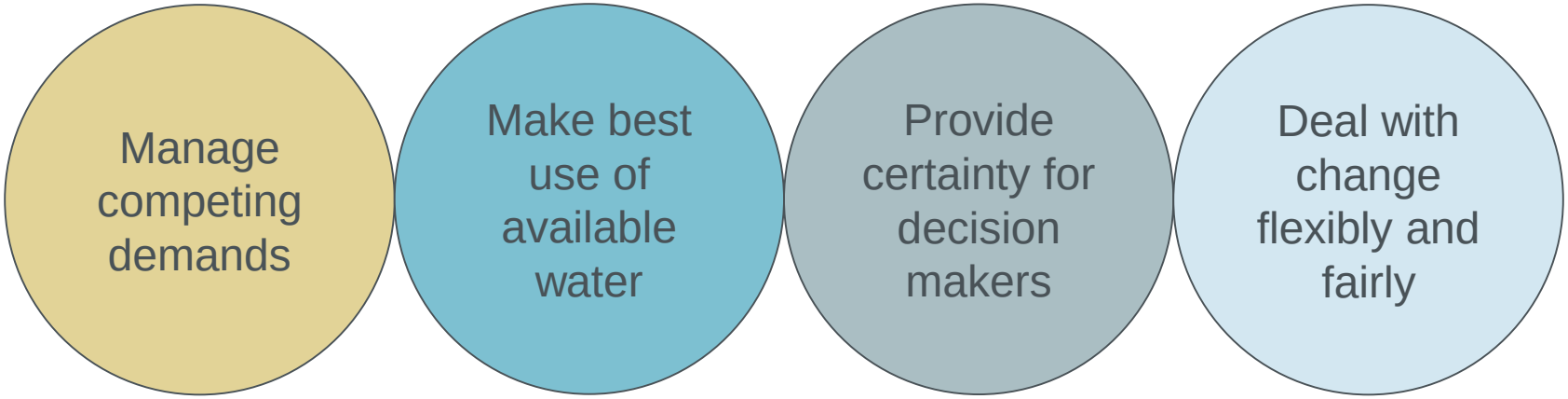
- Many years of continuous development of water resource
  - Without regard to environmental and third party impacts
- Severe droughts, ongoing and increasing water variability
- Increasing demand (population growth, growth in industries)
- Over allocation of water resources, leading to:
  - Environmental impacts (salinity, BGA, biodiversity, flora/fauna)
  - Economic impacts (not enough water to meet rights issued, business and industries fail or struggle)
  - Water scarcity
- Inefficiency in irrigated agriculture
  - no value of water revealed, no incentive to improve
- Inflexibility
  - difficult to reallocate water to different / more efficient users

Water markets as response to challenges

- Need to manage water within newly established cap
  - How to allocate water given scarcity?
- Need greater flexibility to respond to new and changing conditions
  - Economic, and environmental
- Enviro. sustainability, economic efficiency, fairness
- Microeconomic reform and changing role of government

Why water markets? – Revealing value

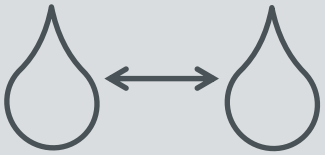
- Many approaches tried, but not effective, not efficient.
- Markets provide a better way:



Water markets ensure efficiency

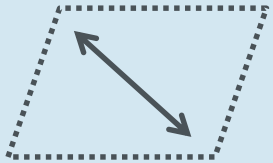
Allocative efficiency

Optimal allocation of water between different users and uses



Productive efficiency

Maximised output of production per unit of water consumed



Dynamic efficiency

Improved water allocation and use across time and space

Water markets have proved key in revealing, incorporating and increasing value

What was done?

Major reforms and enablers of water markets

What did Australia do? – Major reforms

- Capped water extractions
  - Water extractions capped at Basin level
- Changed the nature of water allocations to users
  - Don't guarantee a volume, guarantee a share of what's available
- Separated land property from water rights
  - Enables water to be aggregated or disaggregated, moved to different locations (where hydrology allows), producer flexibility
- Enabled trade in water rights
  - Between all and any users/holders, within the cap, and subject to trade rules (environmental & third party)

Implemented in various intergovernmental agreements, legislative changes, regulation, at state and national government level

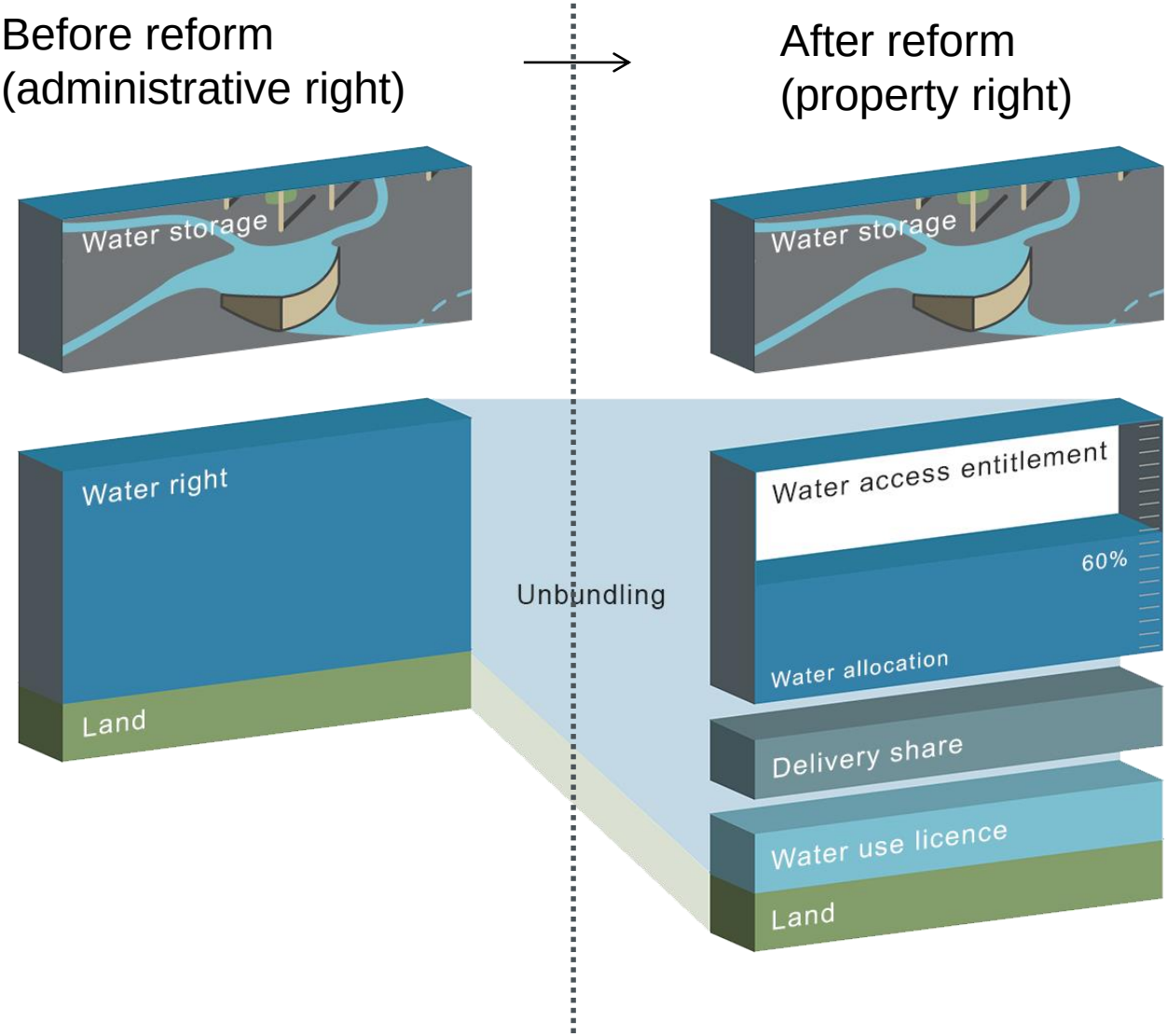
Major state and national reforms

- Intergovernmental agreements
  - Murray Darling Basin Agreement
  - 1994 COAG Water Reform Framework
  - 2004 National Water Initiative
- Basin scale caps
  - 1997 Murray-Darling Basin Cap
    (now sustainable diversion limit (SDL)
- State based legislative changes
  - Victorian Water Act 1989
  - NSW Water Management ACT 2000
- National legislation / agreements
  - Commonwealth Water Act 2007

Changes in the approach to water allocation

- Older permits (e.g. issued from 1920s through 1970s) guaranteed a volume of water
  - E.g. irrigator receives 20ML every year
  - This was unsustainable given the permits issued (volume of permits exceeded water available, or negatively impacted on environment)
- New approach guaranteed a % share of water available
  - No guarantee of a ML amount, only guaranteed a % share of the total ML available each year (based on rainfall, storages, runoff)
  - This meant government and the resource no longer at risk – water users need to manage water use

Major reform: Unbundling of water rights



Wide range of other supporting changes

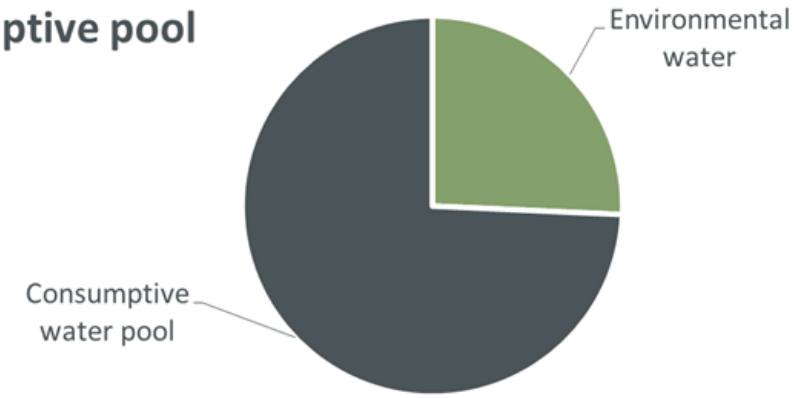
- Metering and accounting
- Monitoring and enforcement
- Governance changes, clear roles and responsibilities
- Water registers and trading systems
- Intermediaries & trading platforms

Australia's water markets

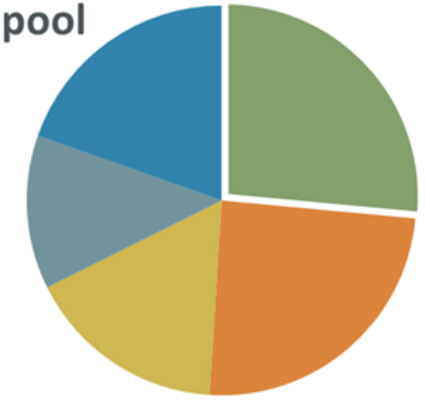
Basic elements and function of Australia's water markets

Cap and trade system applied to water

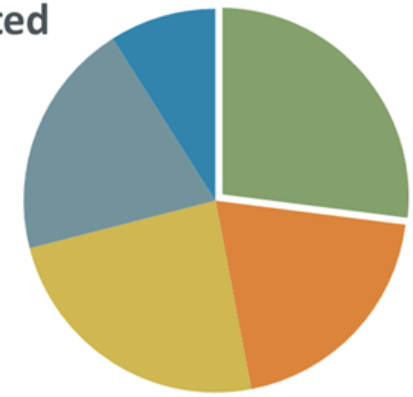
1) Limit total extractions and define consumptive pool



2) Specify individual rights to the consumptive pool



3) Trade allows individual water rights to be reallocated



Water entitlements and allocations

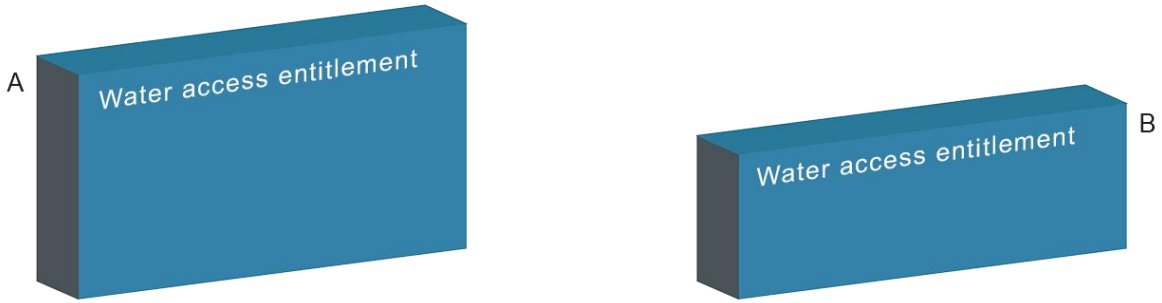
- Water entitlement
  - A property right, gives holder right to receive a % share of water available each year, in perpetuity
  - Different entitlements have difference characteristics (e.g. higher and lower priority / reliability)
  - Not physical water

Entitlement provides right to receive allocation

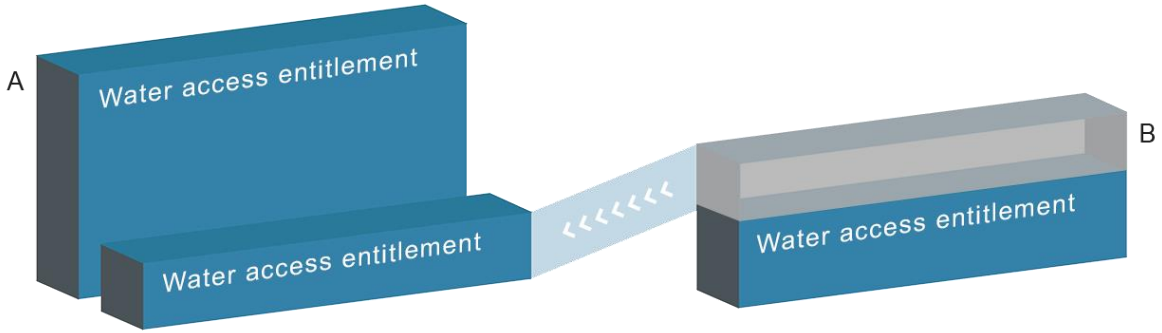
- Water allocation
  - Physical water
  - An amount of water progressively allocated to the entitlement holder through each water year (season)
  - Based on the size of their entitlement, and water available (e.g. dam storage level, inflows, runoff, etc.)

Trading water entitlements

Before trade

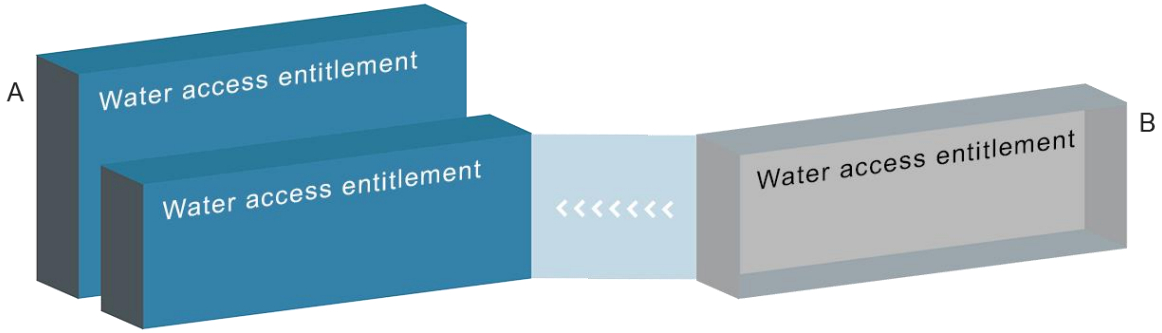


First trade is for part of the entitlement only



B sells entitlement to A

Second trade is for all of the entitlement



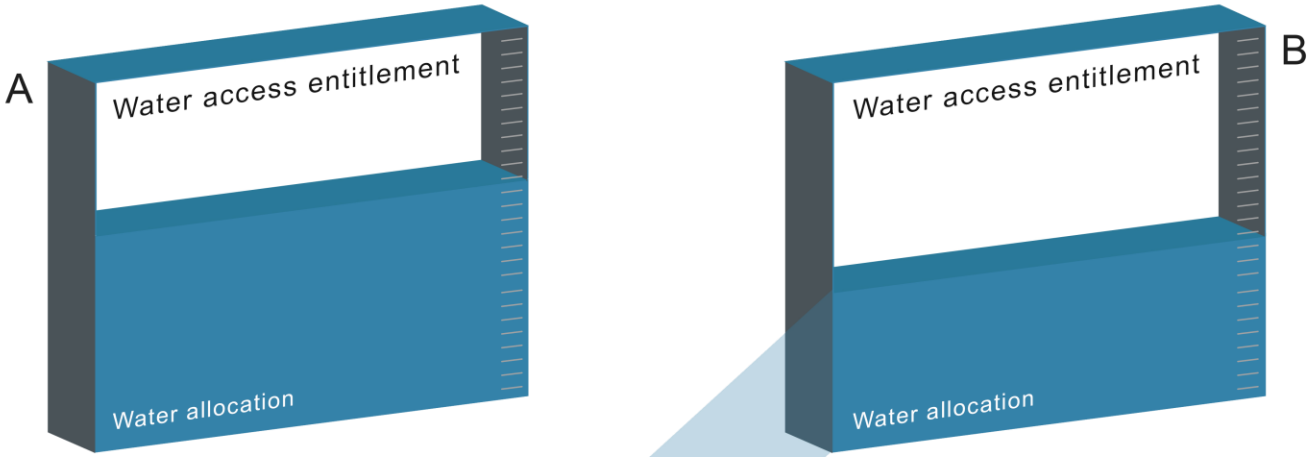
B sells entitlement to A

Trading water allocations

(A) holds higher security entitlement

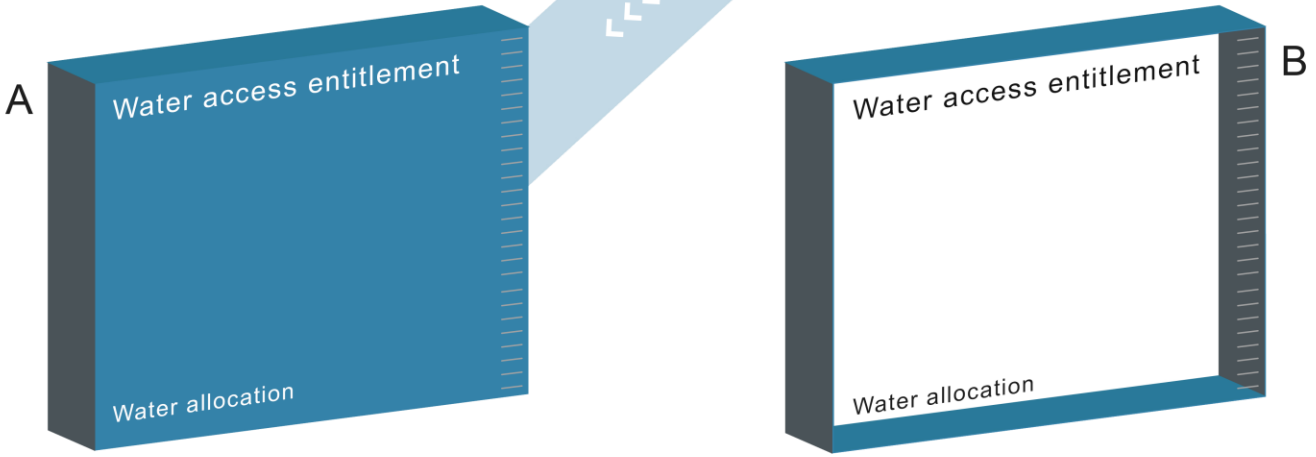
(B) holds lower security entitlement (less allocation received)

Before

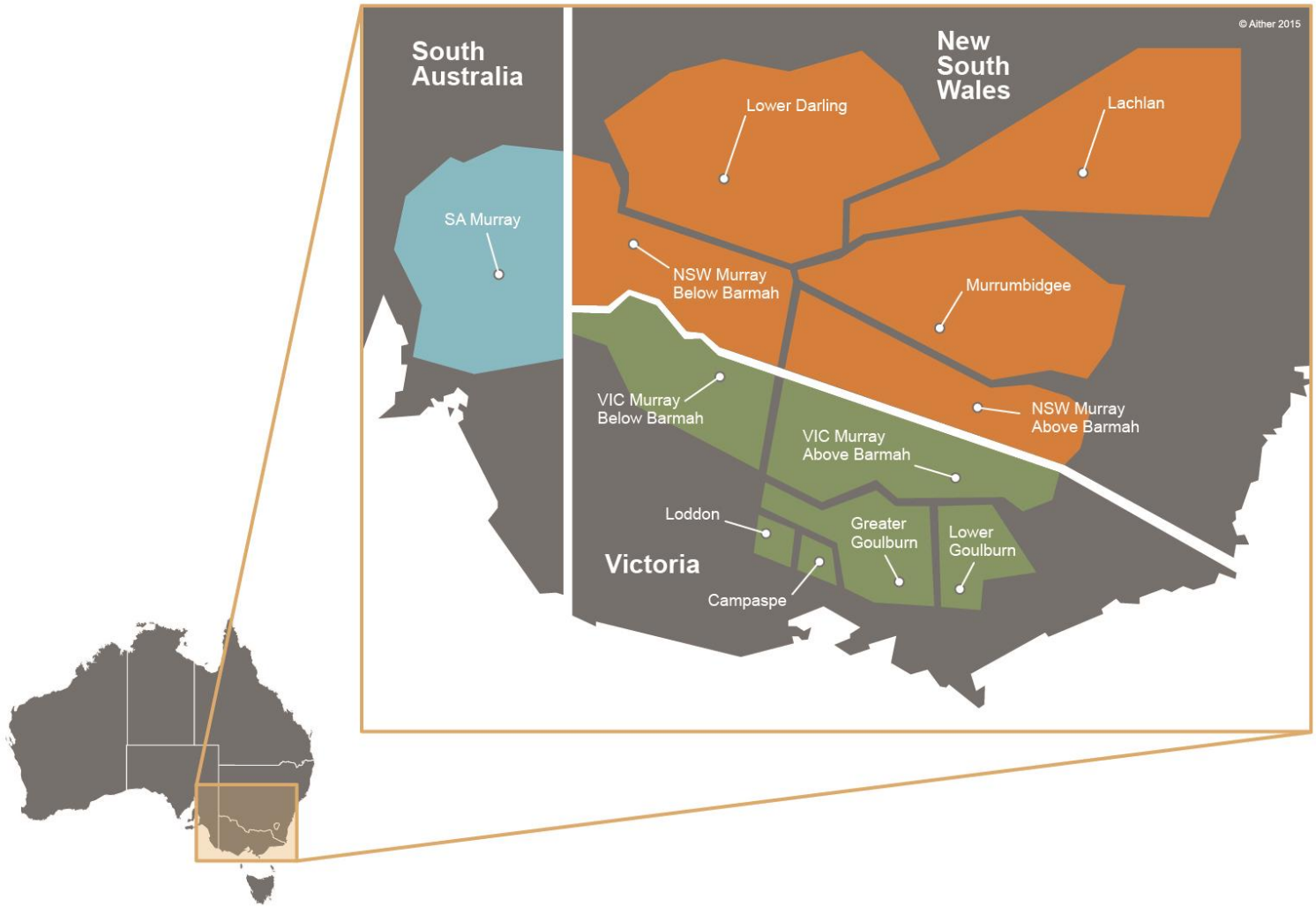


After

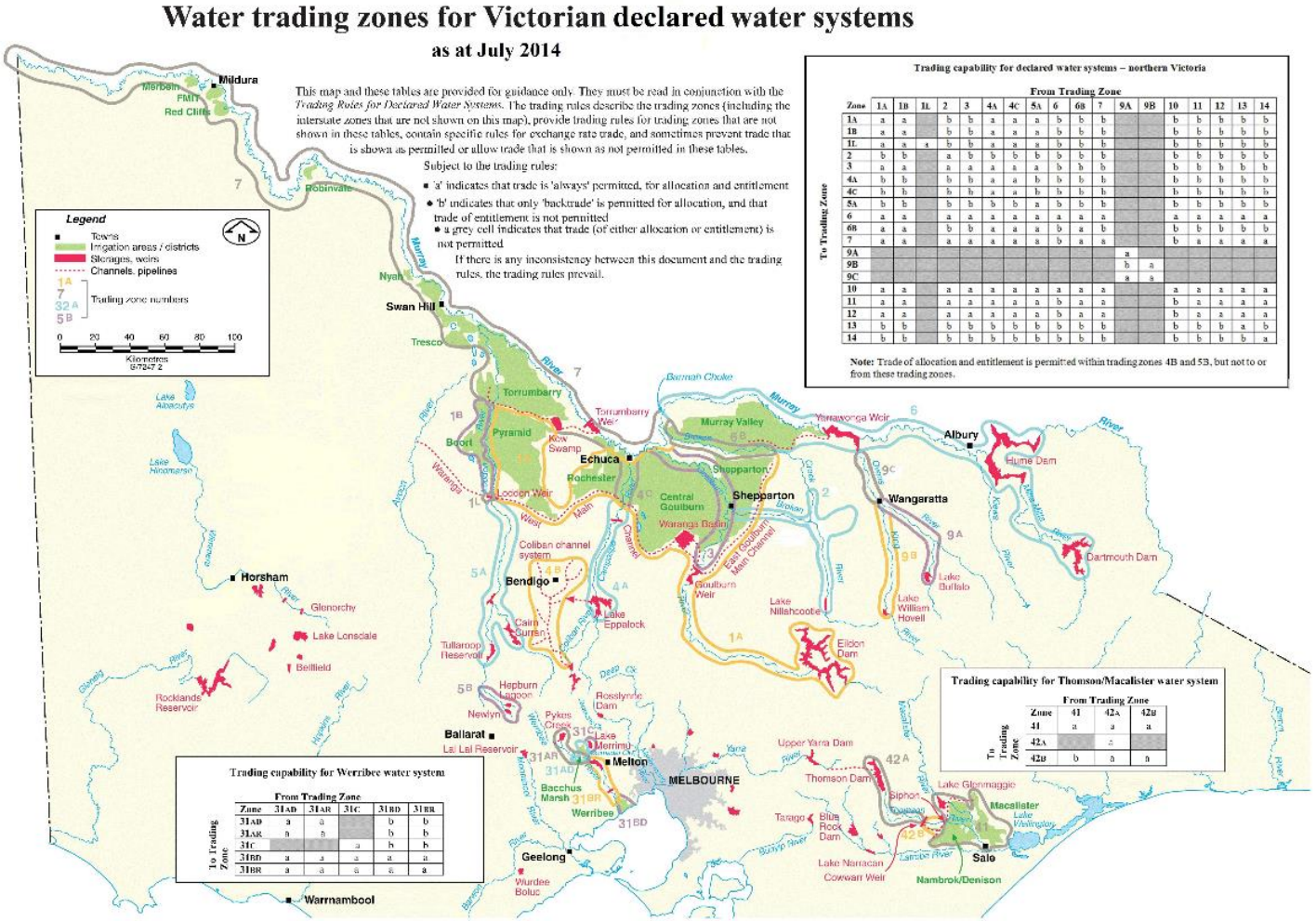
(A) Sells all water allocation to (B) for this year, but continues to hold entitlement for future years



Connected trading zones exist across large basins



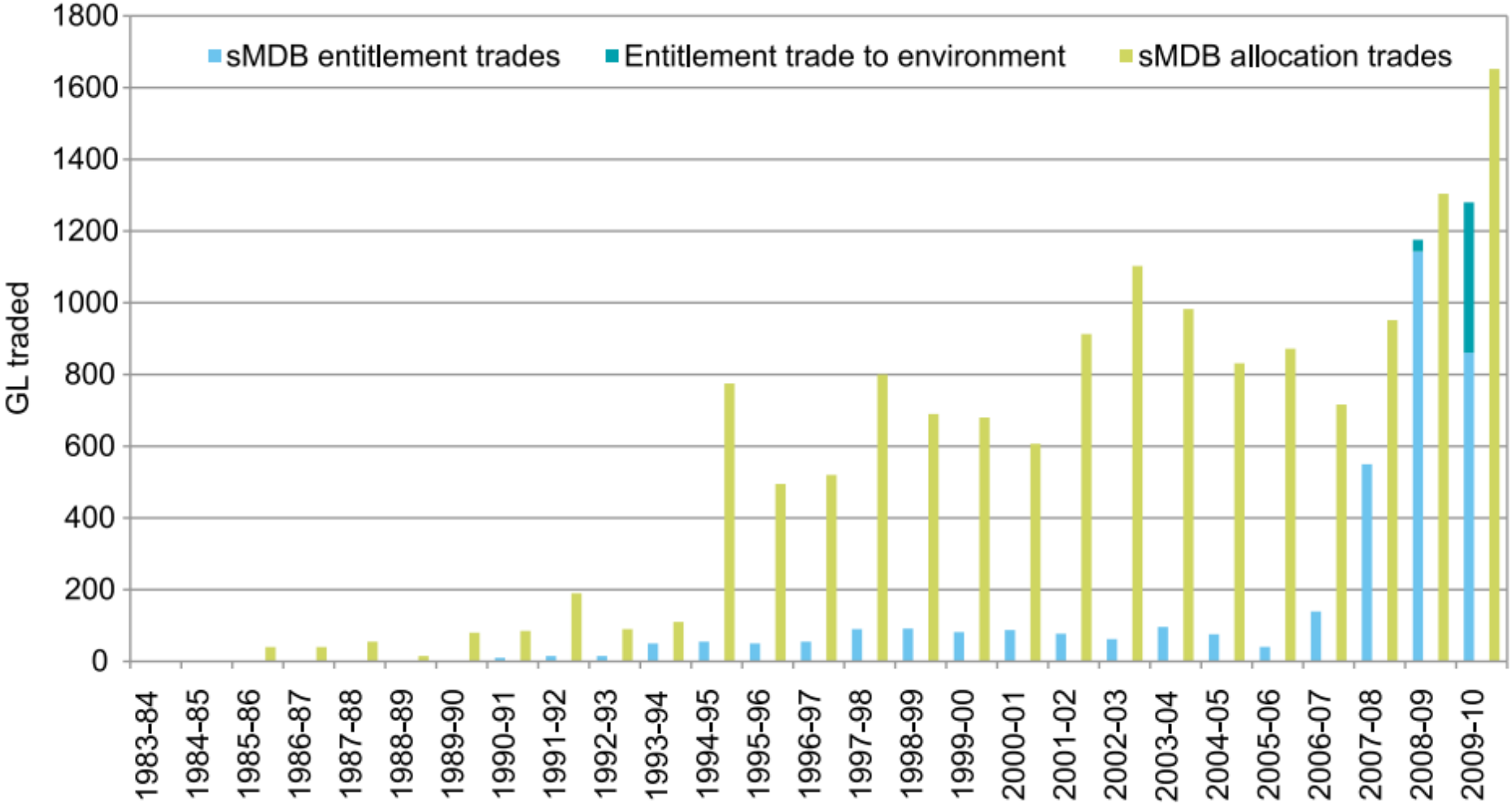
With rules and regulations about trading between zones



Results and performance

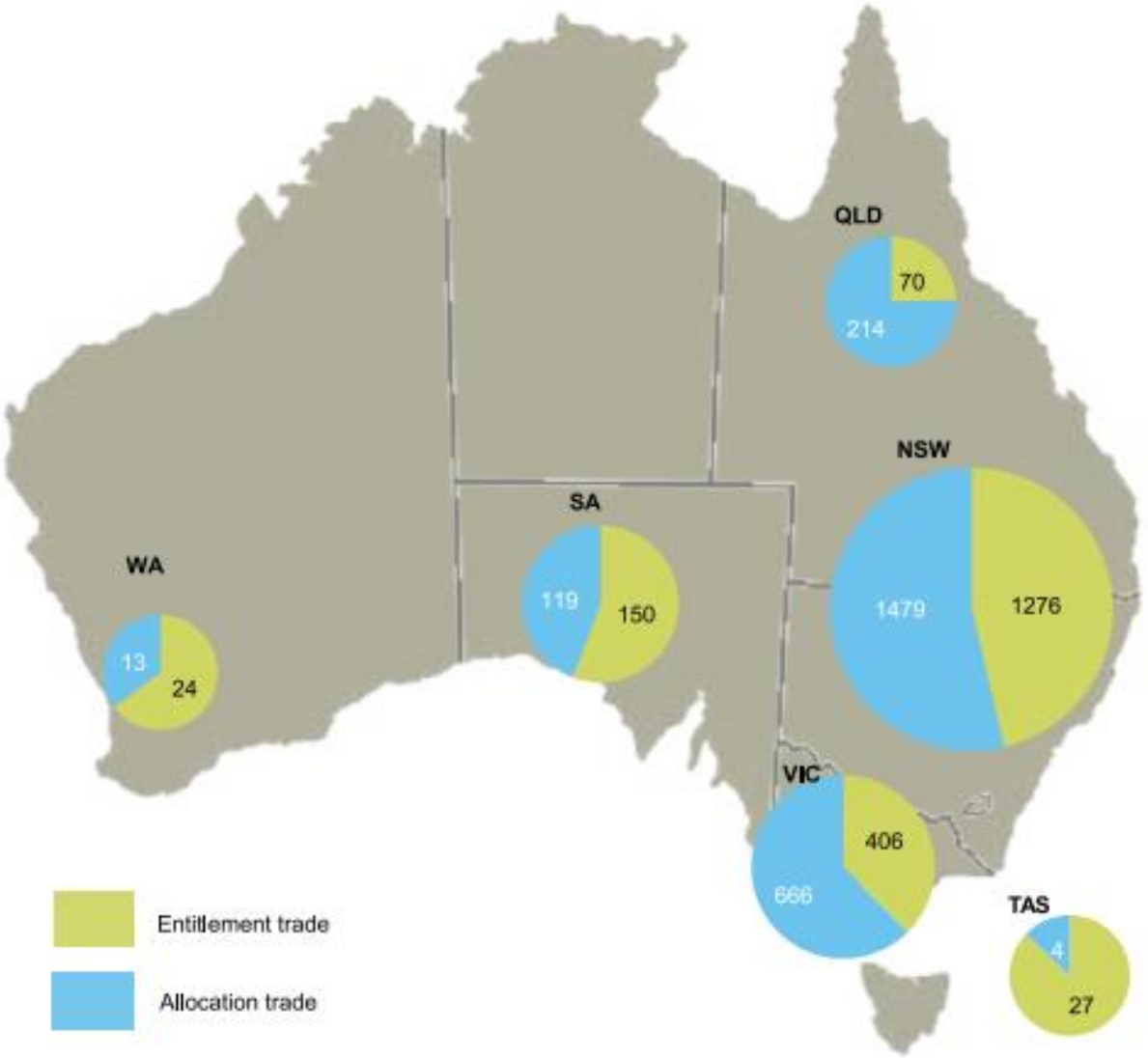
Outcomes from Australia's water markets following implementation

Markets have grown and expanded



Markets exist throughout the country

Figure 2.3: Water entitlement and allocation trading in Australia, 2009–10



Markets well developed and heavily relied upon by water users

Trading is now business as usual

- Entitlement and allocation trade have both increased strongly over the last decade

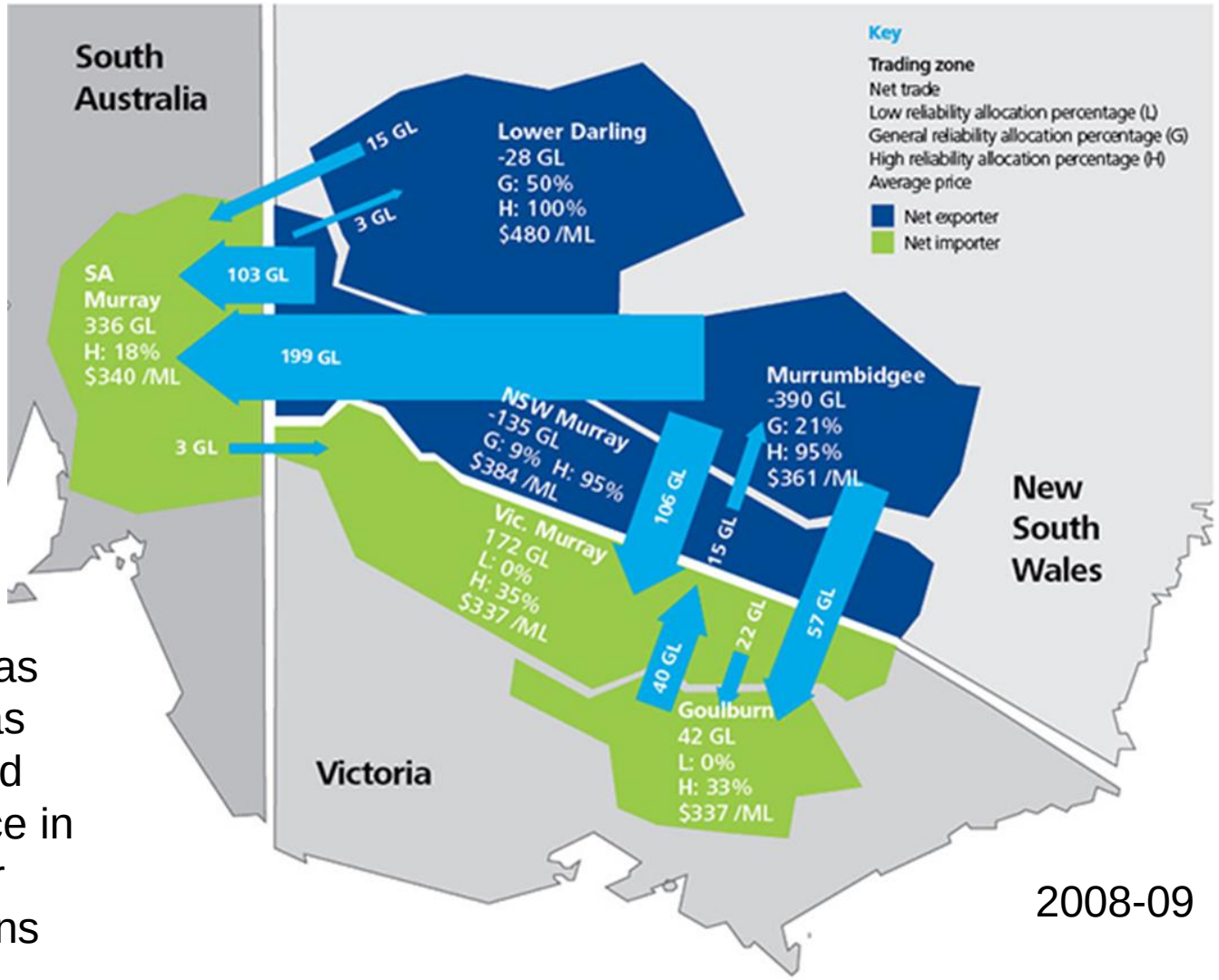
Significant trade year on year

- AUD 400 million in entitlement trade
- AUD 260 million in allocation trade, 2015-16

Market value has almost doubled in three years

- Market value in sMDB now AUD 11.5 billion
- Commonwealth purchases in sMDB now valued at AUD 2 billion

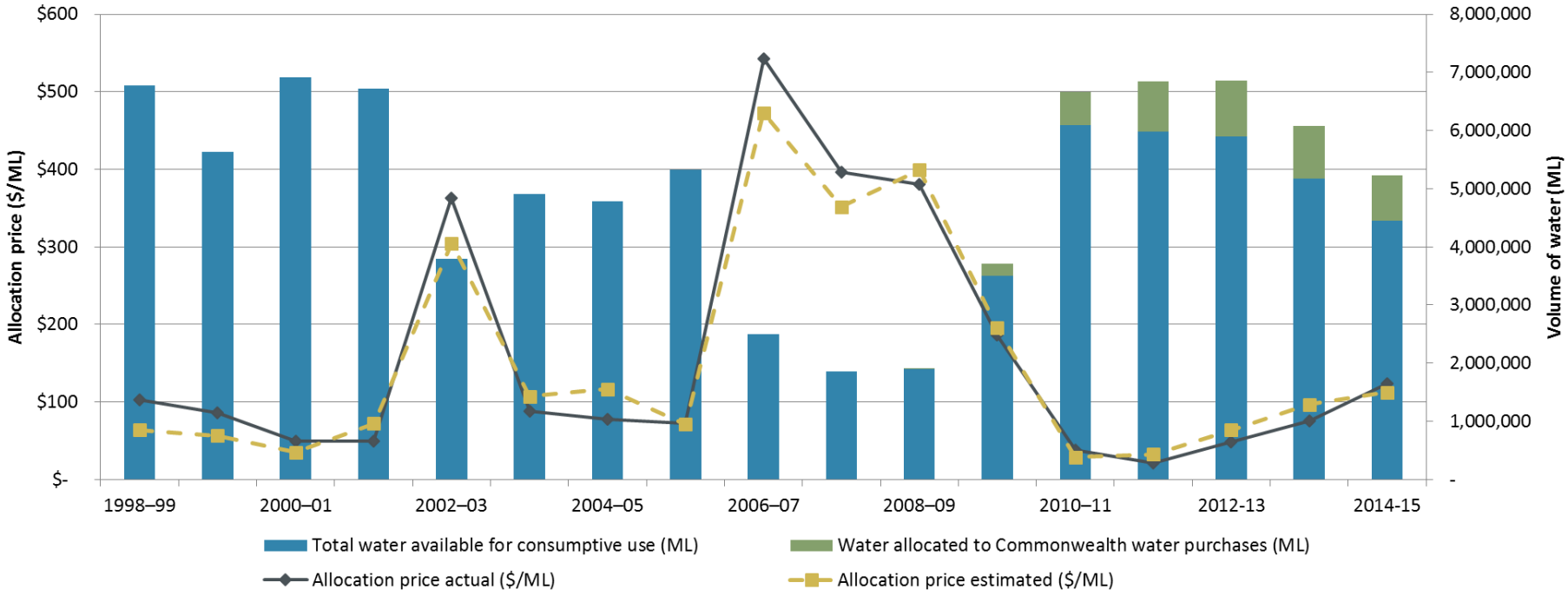
Dynamic water redistribution is occurring



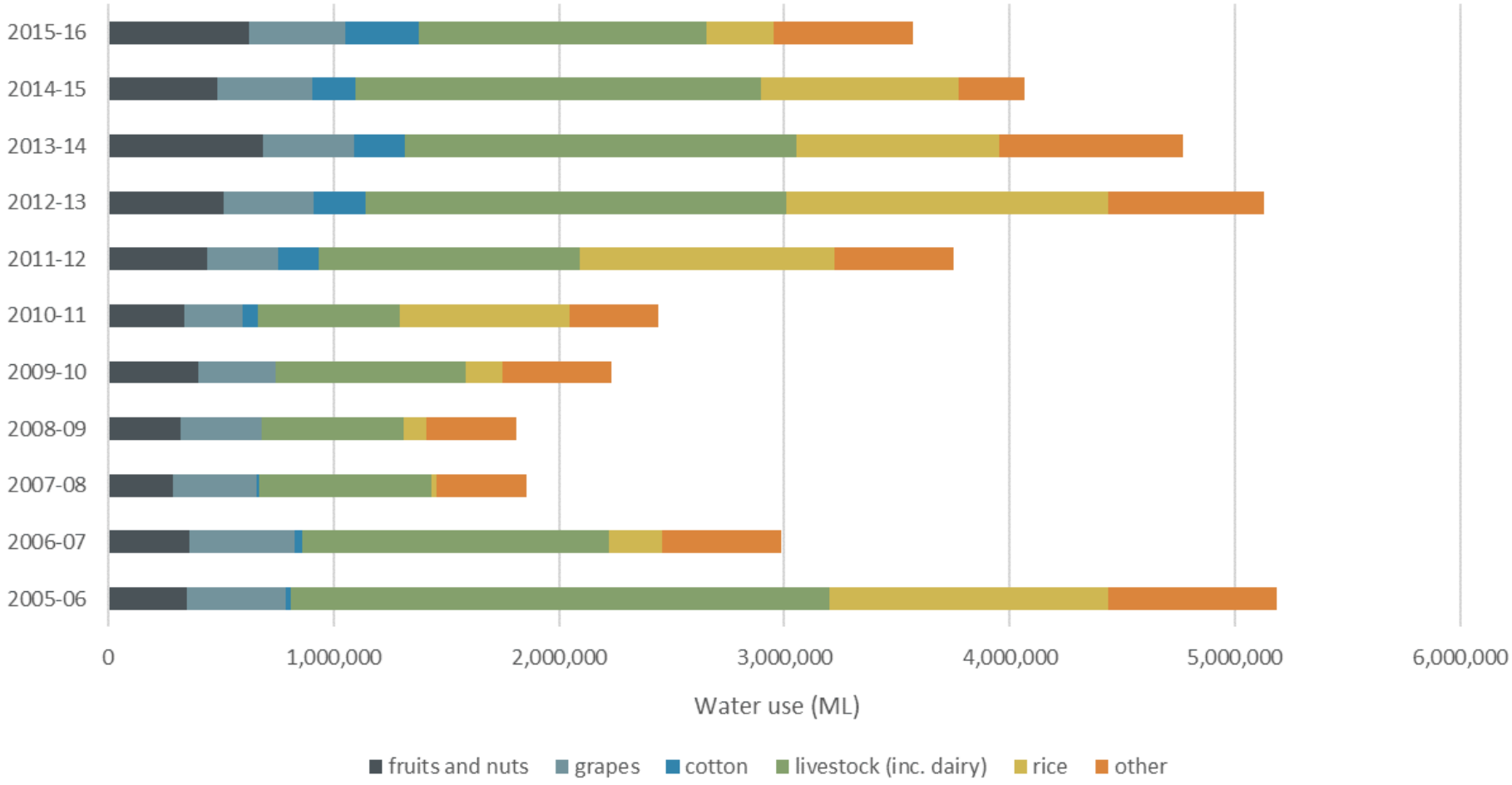
Trade has trade has improved resilience in all water conditions

2008-09

Supply and demand determines water prices

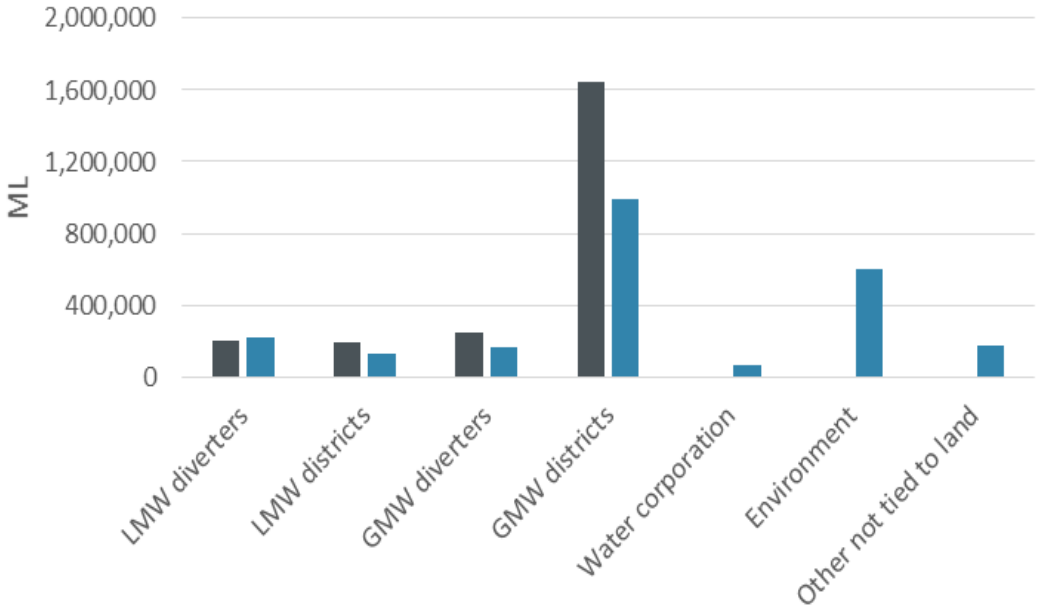


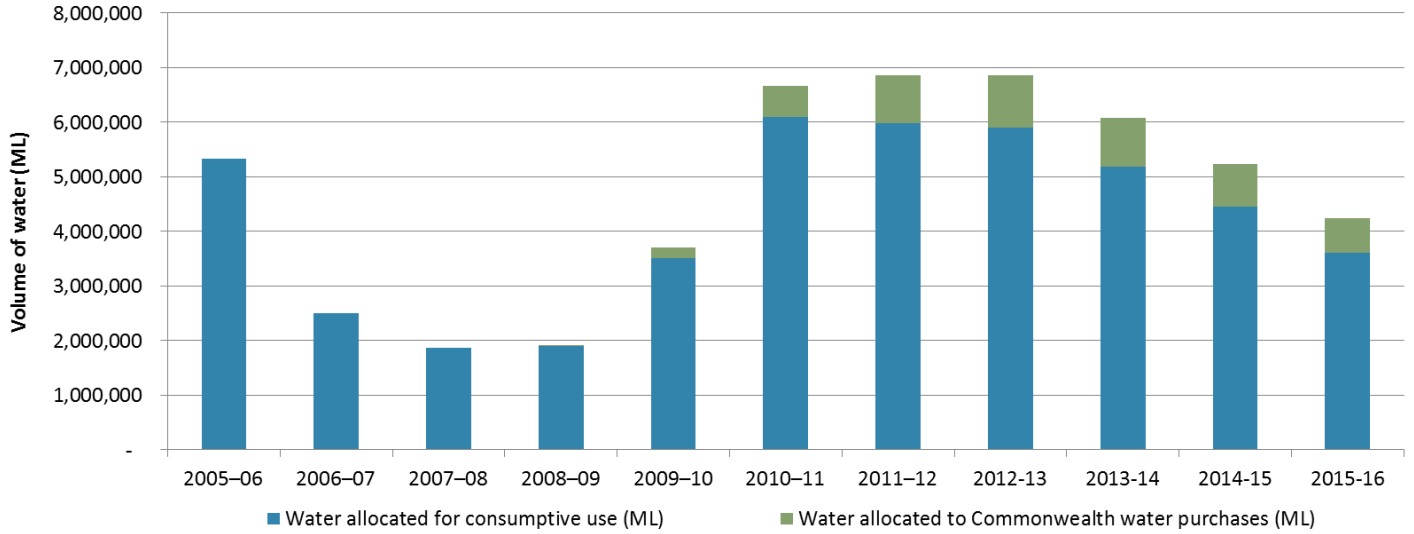
Water is redistributed between crop types



Water has been reallocated to the environment

Southern
Murray Darling-Basin





Market ensures economic output when water availability is low

Year	Water applied (estimate, GL)	Change (%)	Gross value of irrigated agricultural production ($m, real)	Change (%)
2005-06	7,370		$5,522	
2008-09	3,492	▼ 53%	$4,349	▼ 21%

Source: Australian Bureau of Statistics

Insights and lessons

Lessons from implementation and considerations for developing markets elsewhere

Insights

- Developing water markets in complex hydrological systems is possible, including across boundaries
- Strong leadership and stakeholder engagement is essential
  - governments, farmers, scientists, academics, environmentalists
- Once trade takes hold, benefits speak for themselves
  - trade has improved resilience, facilitated adjustment, increased investment and moved water to more productive, higher value use
- Australia now manages water scarcity much more effectively, and is vastly better prepared for drought

Reflections on implementation

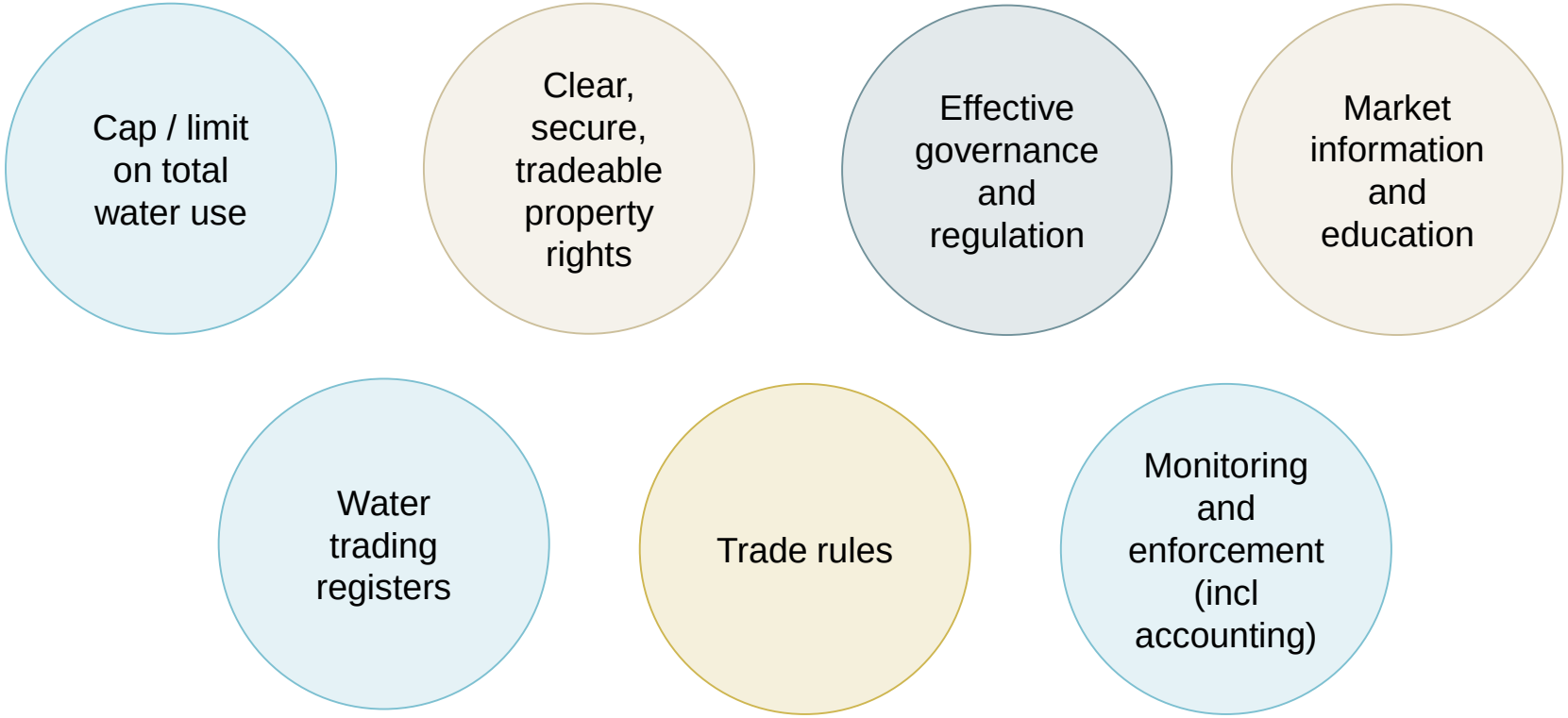
- Stakeholders need clarity about trade-offs and how decisions will be made
- Progress stalls without effective stakeholder communication and genuine stakeholder participation
- Allow market to redistribute water, and deal with adjustment impacts and social issues via other areas of policy
- Demonstrate outcomes, and ensure participants can experience benefits themselves
- Scalable, incremental change is possible, and can safeguard against unintended consequences

Pre conditions for implementing markets

- For markets to be of benefit, several pre conditions generally need to be met:
  - Water scarcity
  - Water variability
  - Connectivity (in hydrology, or via infrastructure)
  - Sufficient number of water users
  - Different water demands amongst users
  - Increasing or changing demand

Fundamental elements of effective markets

- Some of the most essential elements for effective water markets include:



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