Australian Bureau of Statistics

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Hybrid Water Accounts for Australia

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Presentation outline

1. Why is combining monetary *and* physical accounts useful?
2. Water valuation issues
3. Experimental hybrid water account for Australia
    - Methods and results

1. Why produce a hybrid water account?

	Stock	Flow
Physical GL, PJ, t	X	X
Monetary $	X	X

1. Why produce a hybrid water account?

- Enables the economic costs and benefits of water supply to be matched with physical data on water stocks and flows

- Informs more efficient water allocations:
  - ideally, require information on: physical water flows; prices paid for water used; value added of water users
  - Council of Australian Governments National Water Initiative

1. Why produce a hybrid water account?

- Costs and benefits can occur:
  - Now / later (temporal)
    - is use by one industry creating a sink for residuals/cost for another?
  - Here / there (spatial)
    - is use in one location eg Upper Murray River causing a cost in another location eg Adelaide?
  - Public / private (and between industries), especially public water supply and private agricultural water use

1. Why produce a hybrid water account?

- Achieving cost recovery for water infrastructure assets
  - e.g recover the cost of building and running infrastructure assets: depreciation and running costs

1. Why produce a hybrid water account?

- Analysing trade-offs between alternative water and economic policies
  - E.g. buy back over-allocated water rights for $5 billion
- To reveal information necessary to calculate the value of the water itself i.e. resource rent

2. Water valuation issues

- The classification of
  - Water
  - Water-related products
  - Water-related industries
  - Water-related infrastructure assets

2. Water valuation issues

- Practical problems
  - What is the true value of self-extracted water?
    - Water pricing and zero resource rents
    - 'Thin' and imperfect markets for water trading
  - Data availability and data quality
- Subdivision of water supply industry
  - Rural: primarily for agricultural use
  - Urban: primarily for household and industrial (non-agricultural) use

Classifying water and water-related assets

Asset

- Has value
- Economic benefit
- Tradeable
- Underlying entity is an asset

Classifying water and water-related assets

1. Water treatment / delivery infrastructure
2. Wastewater and sewerage (incl. environment protection expenditure, both current and capital)
3. Water application and management infrastructure (e.g. flood mitigation works, sprinklers)
4. Water instruments – restrictive permits etc.
5. Water itself e.g. distributed water (wholesale and retail), re-use ('grey') water, surface water, groundwater and rainwater

4 and 5 not included

3. An experimental monetary water account for Australia, 2004-05

- Combines physical data from ‘Water Account, Australia 2004-05’; with Monetary data for 2004-05
- Scope: distributed water only
- Released 15 August 2007
- Data considered ‘experimental’
- ABS Cat. no. 4610.0.55.005, see www.abs.gov.au

	Stock	Flow
Physical GL	Water Account, Australia 2004-05 for dams	Water Account, Australia 2004-05
Monetary $	Experimental Monetary Water Account, Australia 2004-05 for infrastructure assets	Experimental Monetary Water Account, Australia 2004-05

Methods: Classification of products and assets

Four products were selected for revenue and expenditure data:

1. Urban distributed water
2. Rural distributed water
3. Bulk water
4. Wastewater / sewerage services

Three assets selected for asset values:

1. Urban water supply infrastructure assets;
2. Urban sewerage infrastructure assets; and
3. Irrigation and drainage infrastructure assets

In-scope

	Self-extracted (GL)	Distributed Water (GL)	Reuse Water (GL)	In-Stream (GL)	Water Consumption (GL)
Agriculture	6,582	5,329	280		12,191
Mining	529	72	7	183	413
Manufacturing	246	341	13		589
Water Supply	11,160	2,045	39		2,083
Electricity and Gas	60,172	115	6	59,867	271
All other industries	862	1,561	78	386	1,021
Households	232	1,874	2		2,108
Total	79,783	11,337	425	60,436	18,676

Methods: Primary data sources, reference year 2004-05

Supply side:

- Revenue received by water suppliers, excluding capital considerations
  - ABS Economic Activity Survey
    - Revenue and expense data from non-govt sector
  - State government, industry association and company annual reports

Methods: Primary data sources, reference year 2004-05, *continued…*

Use Side:

- revenue paid by water users excluding capital costs
  - Households: State government reports, ABS Household Expenditure Survey, Industry association publications
  - Agriculture: ABS Water Use on Australian Farms
  - Other industries: ABS Economic Activity Survey
  - Sewerage services: ABS Environmental Protection Expenditure Account for structural data only ie total supply of sewerage services

Key physical and monetary water measures

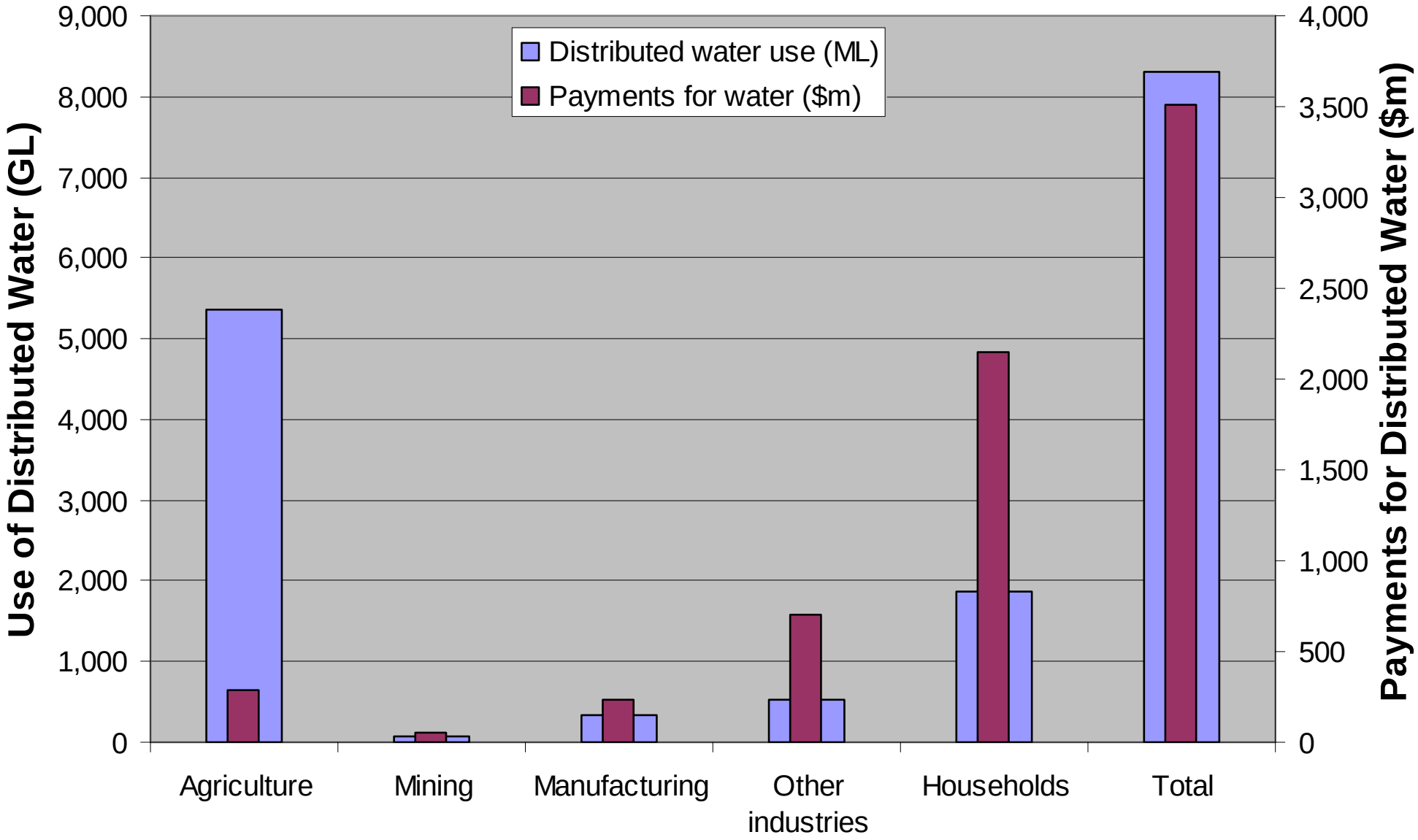
Comparison of key physical and monetary water measures, Australia – 2004-05

	Use of distributed water (GL)	**Payment for distributed water ($m per GL)**
Agriculture	5,353	0.05
Mining	72	0.74
Manufacturing	341	0.68
Other industries	531	1.3
Households	1,874	1.1

Payment for water

- Reflects costs associated with storage, treatment and distribution, rather than the value of water itself
- Higher prices charged to households reflecting more sophisticated levels of water treatment and distribution
- Higher proportion of costs associated with water storage, treatment and distribution is recovered from households

Water use and payments for water, 2004-05



Key physical and monetary water measures Cont…

Comparison of key physical and monetary water measures, Australia – 2004-05.

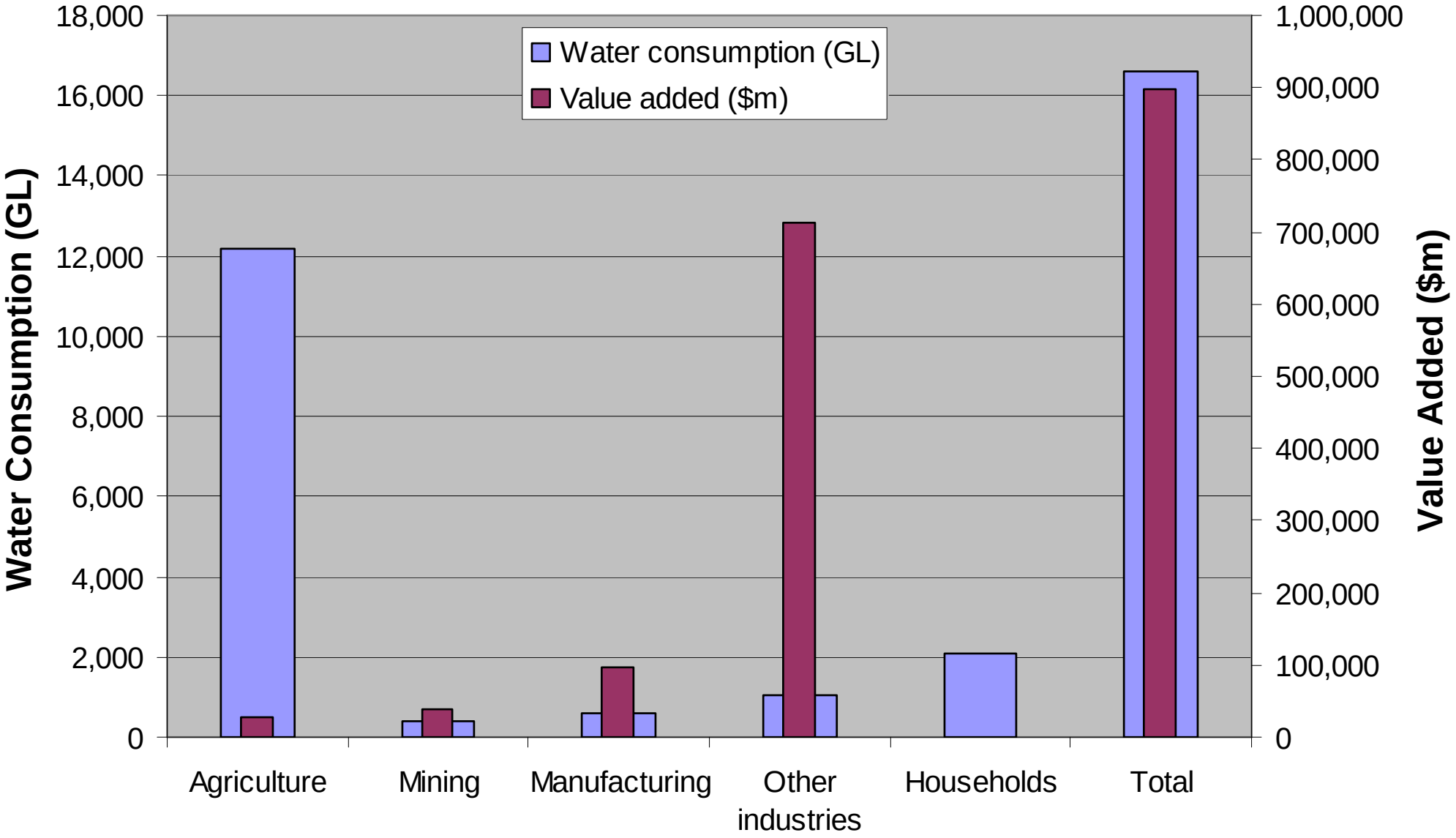
	Water consumption (GL)	**Industry gross value added ($m per GL)**
Agriculture	12,191	2
Mining	413	97
Manufacturing	589	166
Other industries	1,059	672
Households	2,108	na

Note : all water, not just distributed water

Industry Gross Value Added for water using industries

- Relationship between water consumption and value added varies markedly from industry to industry
- Relationship between water consumption and value added is dependent upon the nature of production processes within each industry
- All industries require water, however, the availability of water is a key determinant of the output and value added for industries such as agriculture

Water consumption and value added, 2004-05



Household water use and expenditure on water (04-05)

	Expenditure on urban water			Population 30 June 2005	Households 30 June 2005	Water use 2004-05	Urban water
	Total	Per capita	Per household				
	$million	$	$	'000	'000	GL	$ / KL
New South Wales	727	107	279	6,769	2,605	545	1.33
Victoria	459	91	236	5,023	1,946	389	1.18
Queensland	446	112	289	3,977	1,544	458	0.97
South Australia	153	99	238	1,542	642	143	1.07
Western Australia	237	118	300	2,011	789	226	1.05
Tasmania	56	115	279	486	201	57	0.98
Northern Territory	28	138	424	203	66	25	1.12
ACT	41	126	320	326	128	31	1.33
Total	2,147	106	271	20,337	7,921	1,874	1.15

Enables check of data quality and coherence with real-world expectations

Hybrid water supply and use table, Australia 2004-05

	Supply: monetary	Supply: physical	Use: monetary	Use: physical
	$m	GL	$m	GL
Agriculture, forestry & fishing			291	5 354
Manufacturing		8	232	341
Mining		5	53	72
Electricity & gas supply		1	91	115
Water supply, sewerage and drainage	3 514	8 296	2	23
Other industries			698	531
Households			2 147	1 874
Total	3 514	8 310	3 514	8 310

Results for 2004-05 hybrid water account

- Total output of water & sewerage services was $7.5 billion, *of which:*
  - sewerage services sales $3.5 billion;
  - urban water sales $3.2 billion; and
  - bulk water sales $0.5 billion; and
  - sales of rural water $0.3 billion

- water supply industry supplied 8,296 GL

Results for 2004-05 hybrid water account

- Households highest expenditure $2,147 million (61% of total), used 1,874 GL of water (23% of total)
- Agriculture spent $291 million (8%) for 5,353 GL of water (64%)
- Victoria lowest annual consumption per household (204 KL) and lowest expenditure per household ($236)
- Northern Territory highest annual consumption per household (379 KL) and highest expenditure per household ($424)

Water supply and sewerage infrastructure assets, 2004-05

	Urban water infrastructure assets $m	Wastewater & sewerage infrastructure assets $m	Irrigation & drainage infrastructure assets $m	Total $m
New South Wales & ACT	12,774	15,231	761	28,766
Victoria	4,943	5,114	2,610	12,667
Queensland	5,379	6,685	1,977	14,041
South Australia	4,859	3,578	329	8,766
Western Australia	2,949	3,583	297	6,829
Tasmania	775	626	48	1,449
Northern Territory	360	113	0	473
Total	32,039	34,930	6,022	72,991

Is revenue received a good return on infrastructure values?

Water supply and sewerage infrastructure assets, 2004-05 *continued…*

- Total assets $73.0 billion
  - wastewater & sewerage assets - $35.0 billion
  - urban water infrastructure assets $ 32.0 billion
  - irrigation and drainage infrastructure assets $6.0 billion

Key data issues

- Macro accounts vs micro level statistics
- Classifications used in water supply industry differ to those in the SEEA account
  - Water Accounts vs water accounting
  - Mainly an issue for physical accounts
- Frequency of collection and reporting
- Repeatability of collection and reporting
- Accuracy and precision (± 0.1%, 1.0% or 10%?)

Key data issues, *continued…*

- Data access
- Level and change vs cause and effect
  - i.e. aggregates vs micro data for research
- Perfection vs realistically deliverable
- Degree possible vs degree necessary

Thank you

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