Dairy Australia

Murray Dairy region

The new normal operating environment for dairy

March 2017

A new operating environment

1. **Murray Darling Basin Plan**

- 2750 GL recovery target by 2019
  - 650 GL in environmental offsets
  - Possible additional 450 GL for a 3200 GL target by 2024
- 2004 GL recovered as of December 2016, including 1659 GL in southern Basin

2. Unbundling

3. Relaxation of trading rules, and southern Basin water market

5. Carryover

6. Drought reserve plus new storage metrics

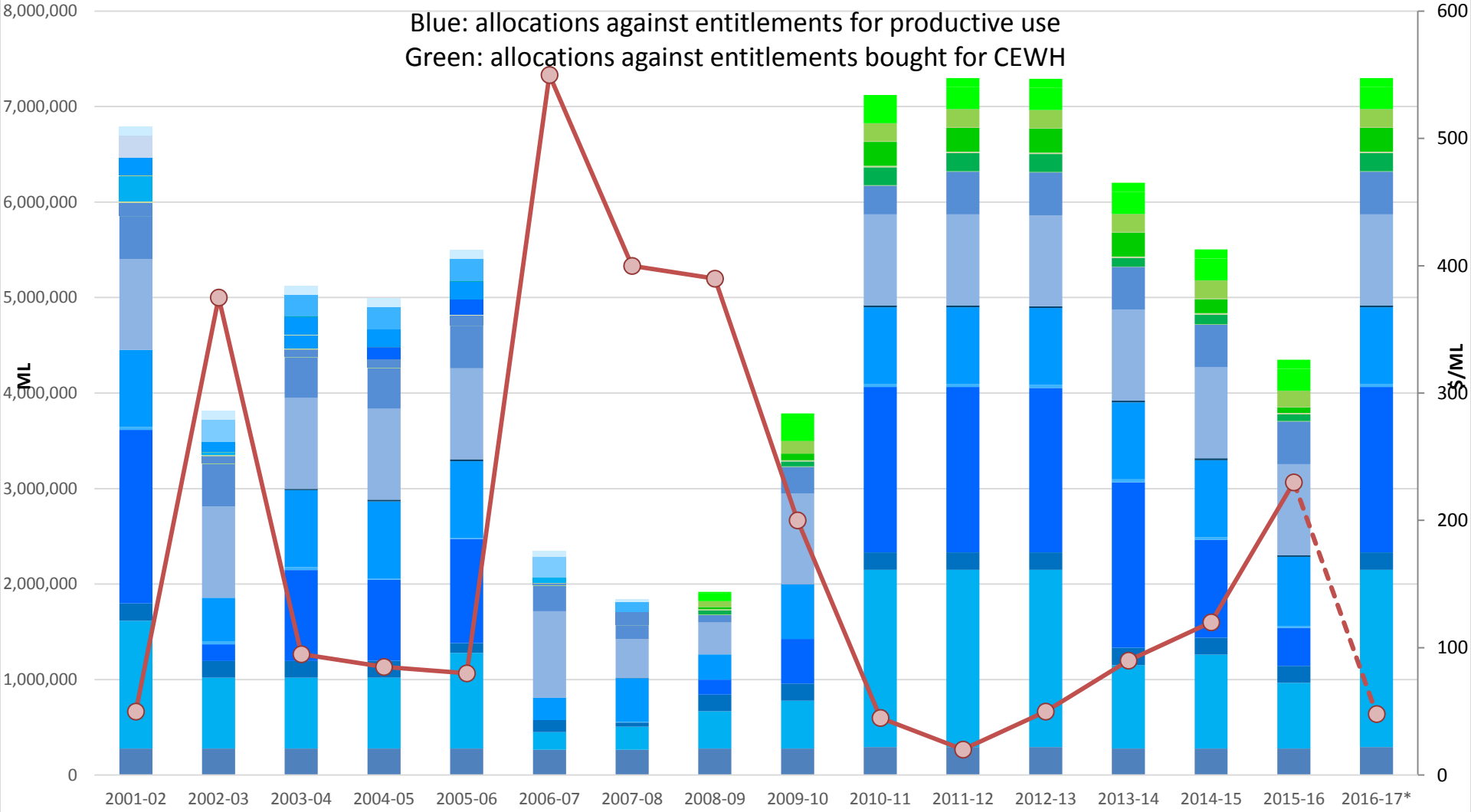
7. Climate change: 1.5°C warmer since 1910
   - Another 1.2°C – 1.8°C by 2040
   - Variable rainfall but 3 - 5% median decrease.
   - Inflows to Murray system: -5 to -12% now, 10-20% by 2030
   - Soil moisture declines: -7 to +1% in summer; -10 to -1% in autumn; -10 to -4% in winter, -13 to -6% in spring.
   - Hotter summers: Tatura 52 days over 30°C now. By 2030, 66 - 74 days over 30°C

Yearly allocation volumes - NSW Murray, Victoria and SA*

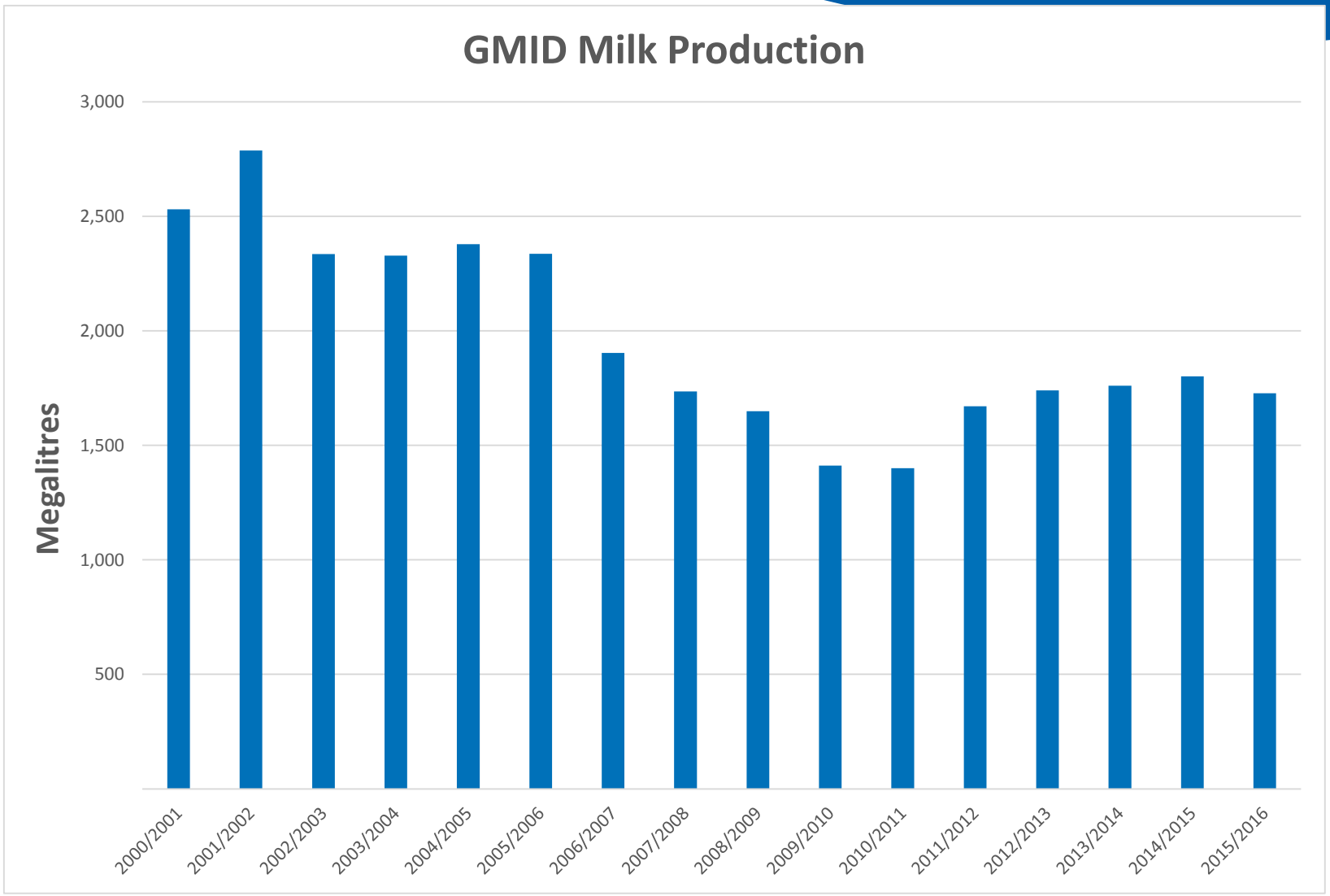
* Excludes LRWS & supplementary; Ovens, Kiewa, Bullarook and Broken valleys

Blue: allocations against entitlements for productive use

Green: allocations against entitlements bought for CEWH



*2016-17 allocation and price as of 22/3/2017


GMID Milk Production
Megalitres
3,000
2,500
2,000
1,500
1,000
500
2000/2001
2001/2002
2002/2003
2003/2004
2004/2005
2005/2006
2006/2007
2007/2008
2008/2009
2009/2010
2010/2011
2011/2012
2012/2013
2013/2014
2014/2015
2015/2016

Aither report

'Water market drivers in the southern MDB: Implications for the dairy industry'.
Report for Dairy Australia 29 July 2016.

Key findings:

Buybacks have shrunk pool for irrigation by average 15% a year.

Temporary water costs $14 - $36/ML more now in an average year like 2014-15.

Temporary water costs $24 - $49/ML more now in a dry year like 2015-16.

Farmers' net returns $440m more if buybacks allocations used in agriculture 2008-09 and 2015-16.

Net farm returns would be $130 million more in 2015-16 alone.

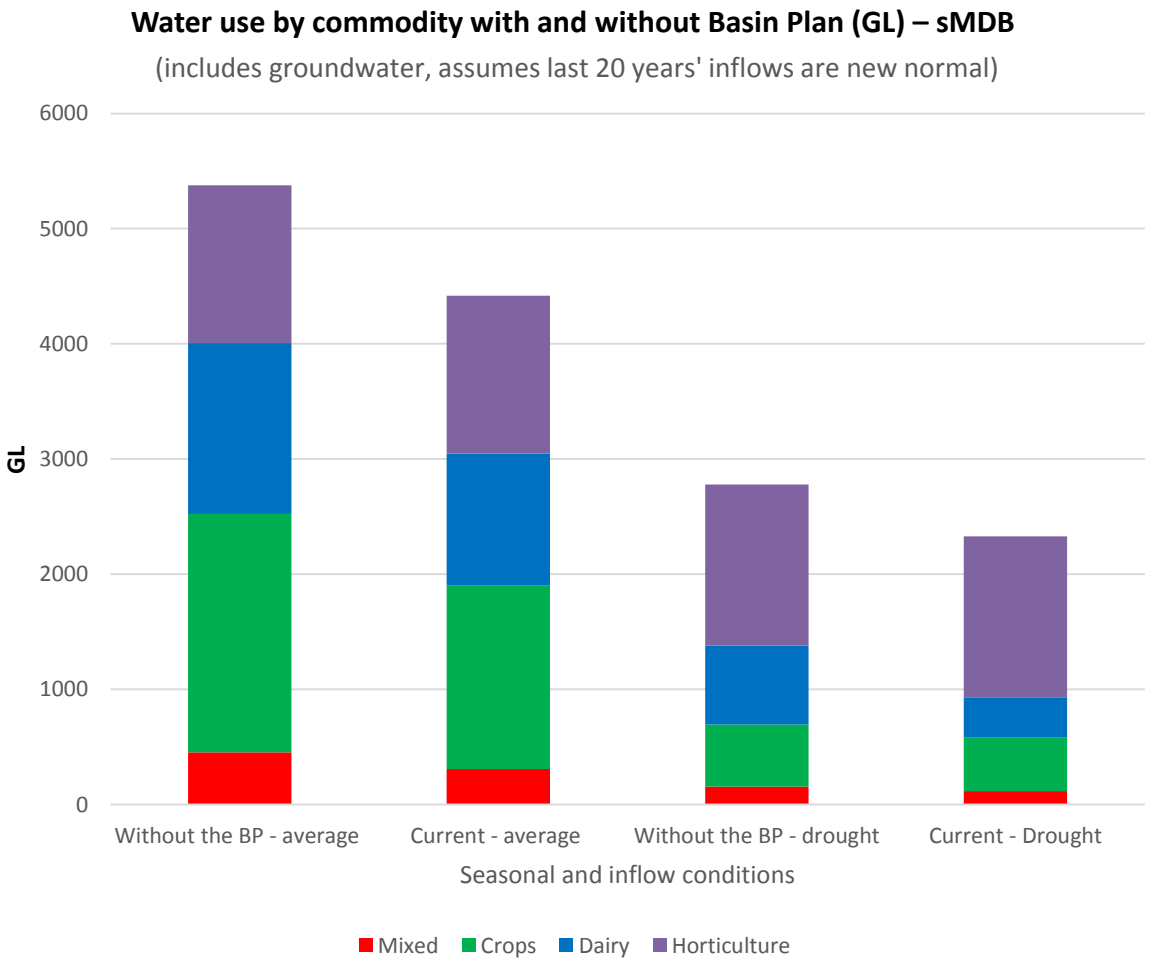
450GL upwater impact on temporary price could be as large or larger than buybacks.

Higher water prices accentuate pressures already confronting dairy farmers.

Milk production is unlikely to return to pre-drought levels given the predicted water prices, without offsetting improvements in milk price, other input prices or production technologies.

‘Basin Plan: GMID socio-economic impact assessment’

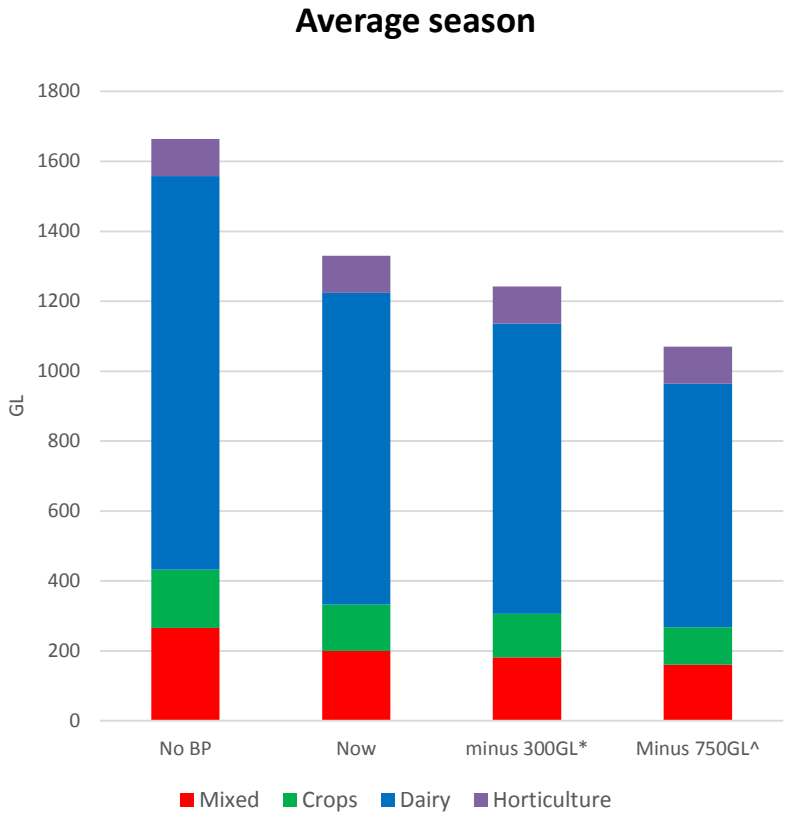
RMCG September 2016

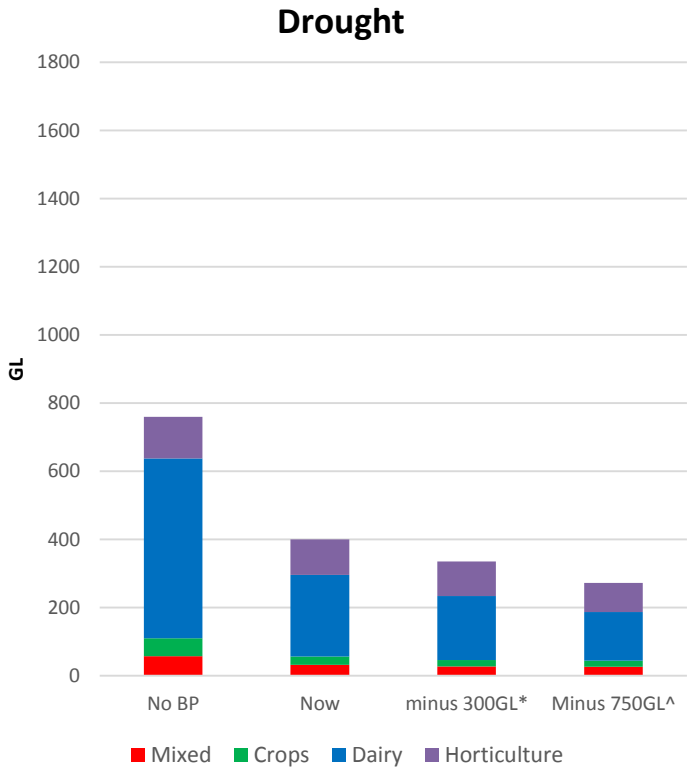


Report commissioned by GMID water leadership forum, formed 28 October 2015 at a water summit in Tatura convened by the Committee for greater Shepparton and Member for Shepparton, Suzanna Sheed. Forum includes community, industry and government representatives.

Note: current horticulture use is 1370 GL a year. New and planned plantings could increase that to 1868 GL.

Basin plan and GMID water use





Assumes GMID dairy farmers will sell allocation in dry and drought periods to horticulture mainly outside the GMID when price is high enough, for cash flow to buy feed instead. Dairy farmers owning little or no HRWS will not have that option, so can't buy feed or water. Further dairy contraction has serious socio-economic implications: dairy spends average $3300/ha purchasing services worth $500 million a year across the GMID. Dryland spends around $600/ha.

RMCG Basin Plan impacts - GMID

- Reduced water availability due to buybacks is costing $550m a year in lost production.
- Dairy is worst hit, losing $200m at the farm-gate, $360 million in processing output
- Mixed farming is losing $25 million a year in annual farm-gate value.
- Horticulture largely unaffected, but future growth limited by water in the next drought.
- GMID irrigators paying $20m a year more for temp water than without the Plan.
- Dairy farmers could be expected to sell allocation in dry and drought years.
- The 30% owning little or no HRWS may struggle for cash flow to buy feed instead.

‘Social and economic impacts of the Basin Plan in Victoria’

TC&A and Frontier Economics for the Victorian Government

– Victoria’s high reliability water disproportionately targeted in buybacks.

– 41% reduction in GMID deliveries (2000 GL down to 1200 GL)

– Horticulture demand for water up from 32% of HRWS allocations to 40%, and could be 56% under 3200GL target.

– Buybacks participants increased reliance on market from 0-12% up to 52%

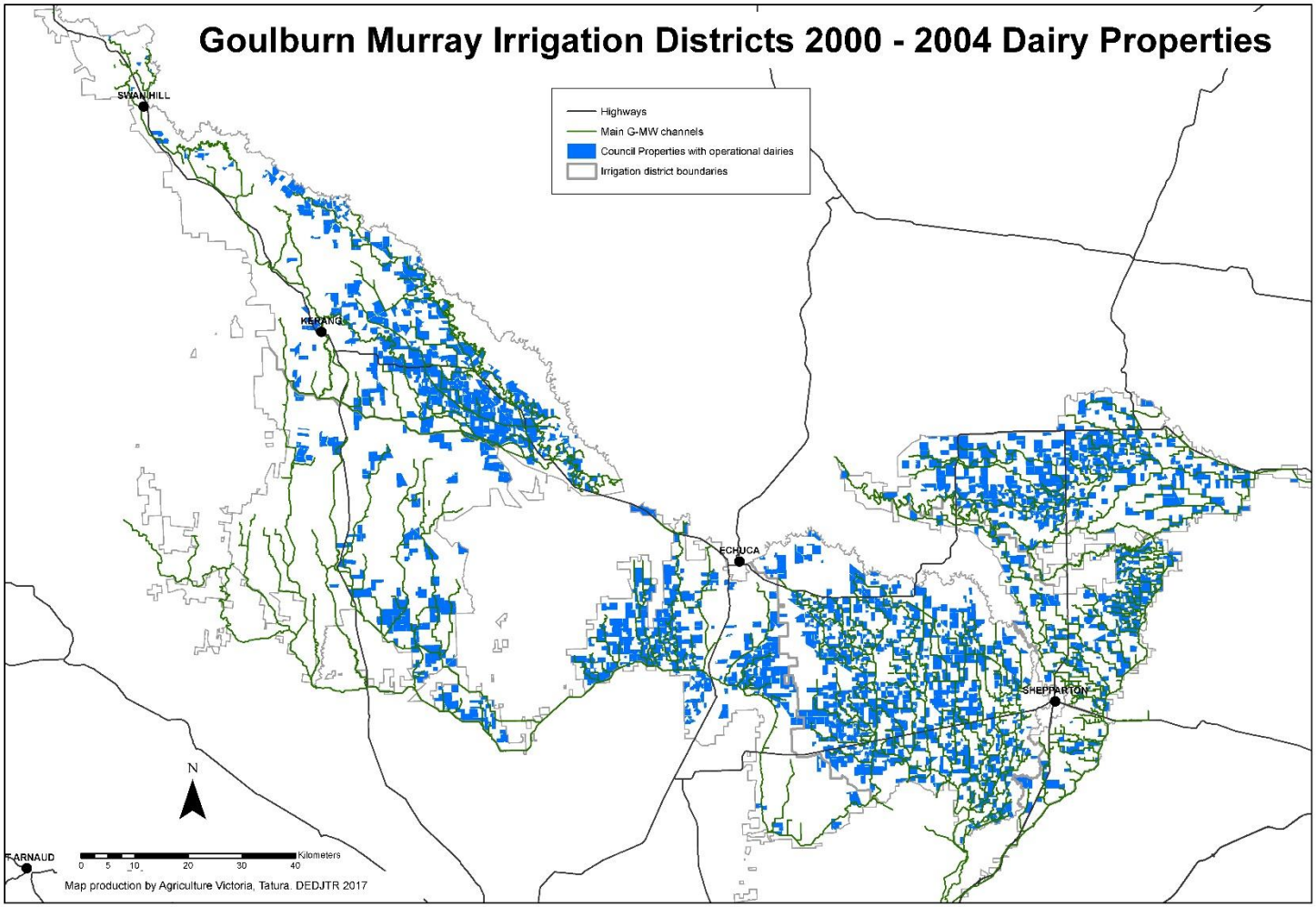
– Reduced water availability may impact tariffs and infrastructure needs

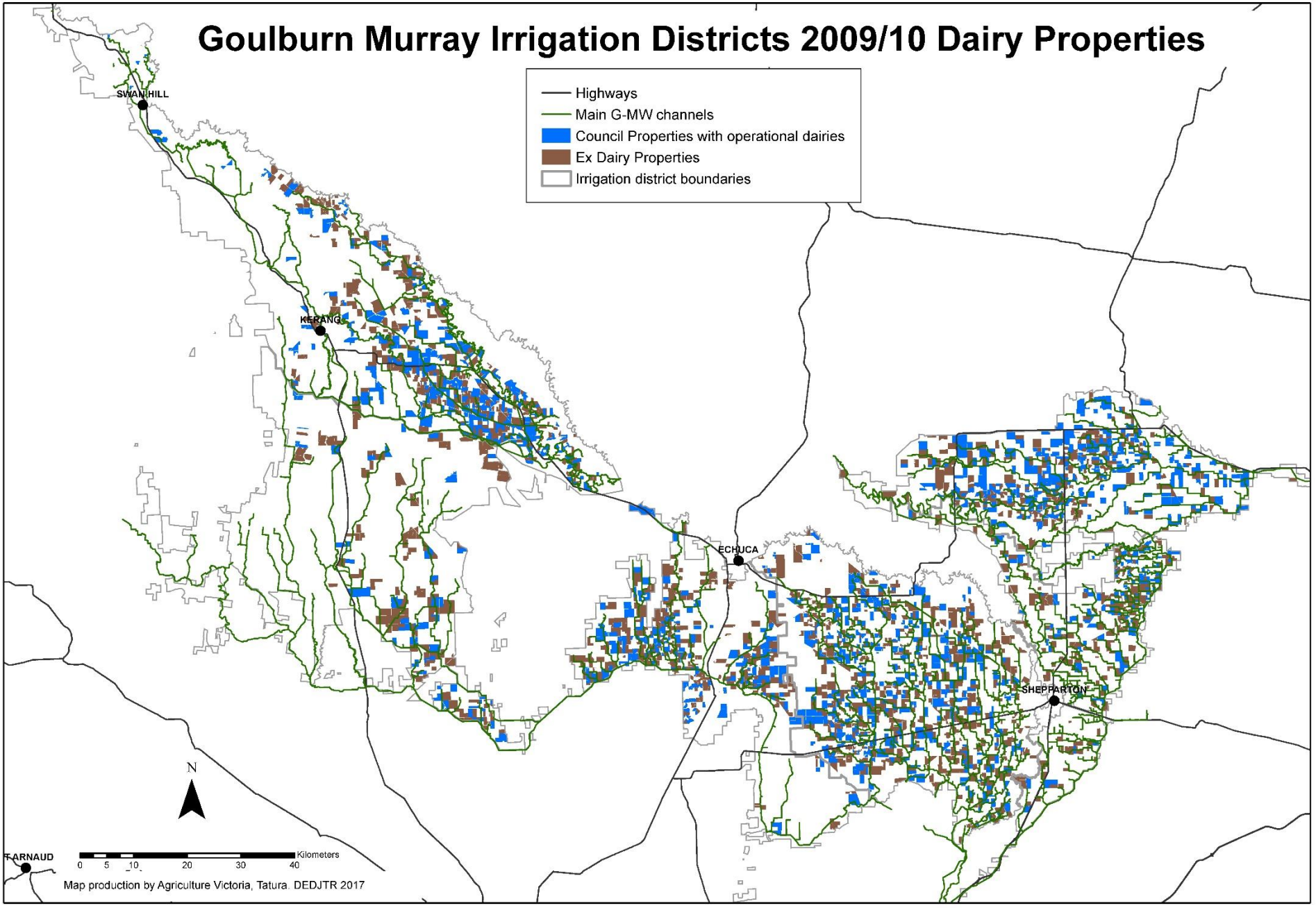
– Milk production would be 30% higher without the Basin Plan

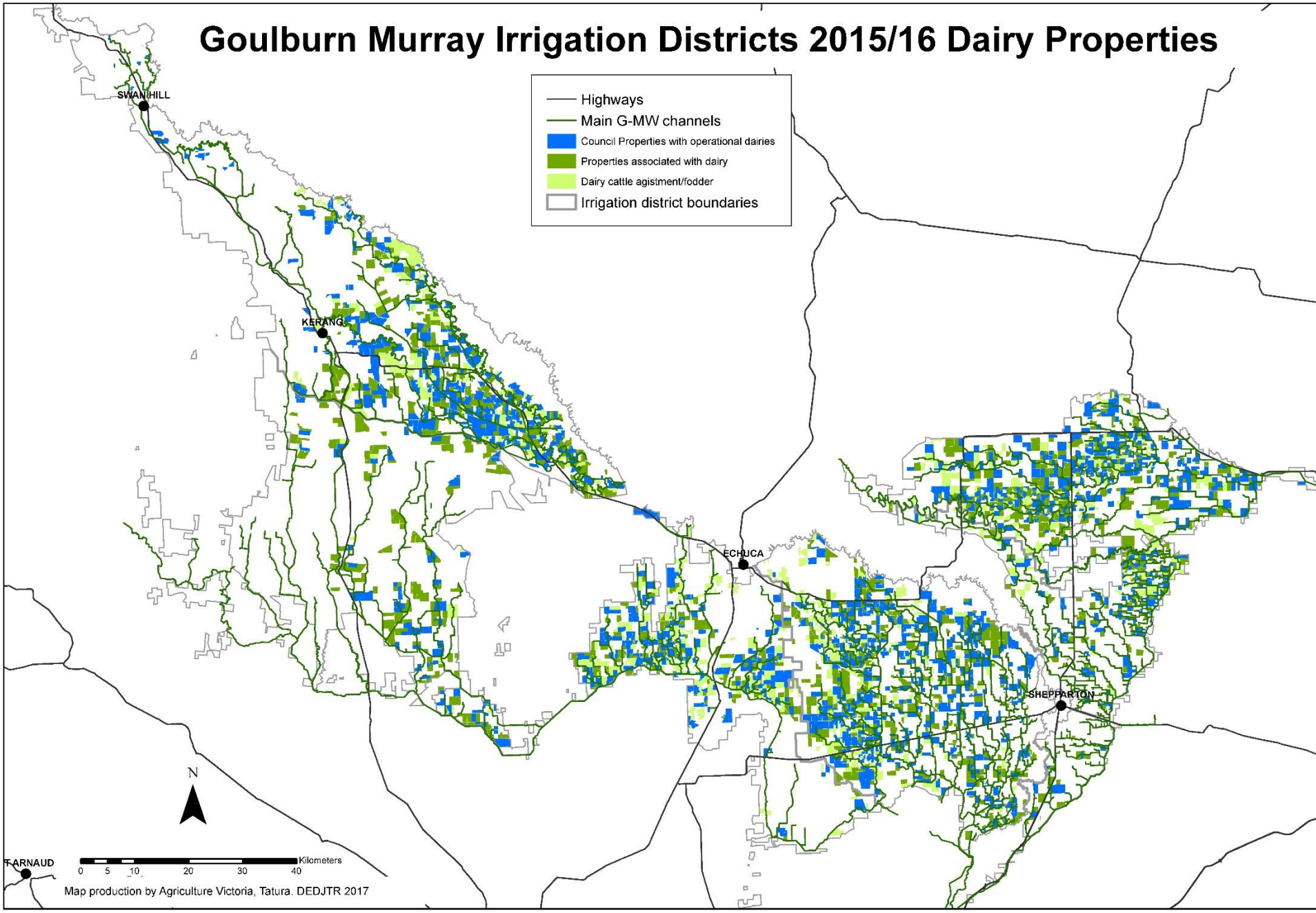
Ministerial Council meeting 17 March: Basin Plan models under review, full socio-economic study beyond legislated minimum.

‘Land Use Mapping in the GMID’

Project funding partners: GBCMA, DELWP, DEDJTR, Dairy Australia, GMW, GMW Connections, NCCMA




Goulburn Murray Irrigation Districts 2009/10 Dairy Properties
Highways
Main G-MW channels
Council Properties with operational dairies
Ex Dairy Properties
Irrigation district boundaries
SWAN HILL
KERANG
ECHUCA
SHEPPARTON
T-ARNAUD
N
0 5 10 20 30 40
Kilometers
Map production by Agriculture Victoria, Tatura. DEDJTR 2017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Council Properties with operational dairies
Properties associated with dairy
Dairy cattle agistment/fodder
Irrigation district boundaries
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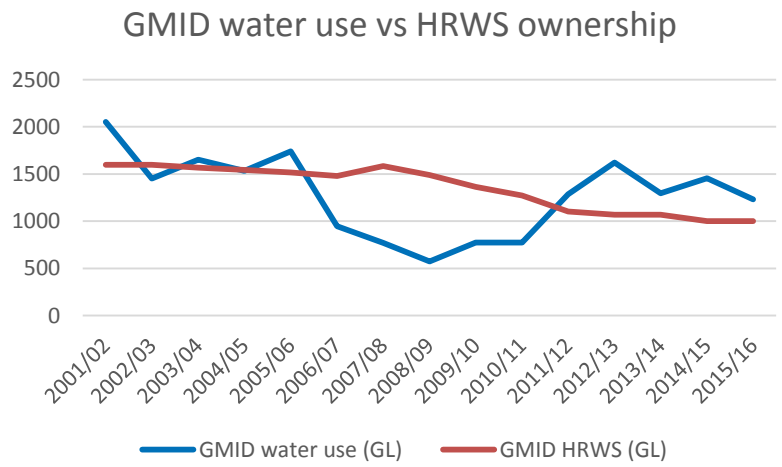
‘Land Use Mapping in the GMID’

Total GMID Water Use and Entitlement Change

Year	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16
GMID HRWS (GL)	1597	1598	1567	1543	1517	1480	1585	1490	1365	1273	1103	1068	1068	1000	1000
GMID water use (GL)	2053	1450	1652	1534	1739	945	769	574	774	772	1286	1622	1295	1456	1230
Dairy HRWS	819		709									470		465	465
Dairy Water Use	1065		922									746		740	600
	+30%		+30%									+59%		+59%	+29%



Nb. 2014/15 water use and entitlement is based on dairy enterprises and dairy agistment. Dairy enterprises are estimated to hold 380 GL with a change in water use from 600 GL in 2014/15 down to 500 GL in 2015/16.

GMID dairy trends over time

Fewer farms spread over larger areas = less intensive production per enterprise hectare = net reduction in milk production

GMID census/land use mapping	No. properties with a functioning dairy shed	GMID milk production	No. of dairy farmers	No. dairy cows in GMID
2004/05	2721[1]	2379 ML	2200	431,666
2009/10	1143 [5]	1412 ML	1377	279,843
2015/16	1142 [5]	1728 ML	1258	320,901

Property refers to land title, or parcel. One dairy farm may have several separate parcels of land as part of the enterprise, and this is counted as 2, 3 or 4 properties primarily devoted to dairying rather than one single dairy farm or enterprise. In 2016, dairy cattle agistment properties and properties used for dairy-related fodder production were also categorised.

^Dairy farmers are levypayers registered with Dairy Australia. Some farm enterprises may include more than one levypayer, such as share farmers or family members.

A higher degree of business risk

- The GMID dairy industry is now more exposed to the temporary water market to meet its production needs, increasing farmers' business risk.

- In 2003/04, for example, the GMID dairy industry used about 30 percent more water each year (922 GL) than its farmers collectively owned in HRWS (709 GL). The extra came from cheap 'sales' water, which was effectively water allocated but unused by other GMID irrigators.

- Now GMID dairy is using 59 percent more water (~740 GL) than it owns in HRWS (465 GL). Dairy farmers compete for the extra water on a market supplying the whole southern-connected Basin.

- Dairy farmers are highly sensitive to the temporary water price: 26 percent say prices over $150/ML are not viable for their business, and another 56 percent say prices over $200/ML are not viable.

The weighted average price in 2015/16, a dry year, was $220/ML, peaking over $300/ML in November 2015 and $250/ML in May 2016.

Dairy land use

Land Use	2000-2004 [1]	2009/10	2015/16
Dairy [2]	235,584 ha (2721 properties)	123,571 ha (1143 properties)	126,720 ha (1142 properties)
Ex-dairy (in transition)		114,500 ha (1700 properties)	
Associated with dairy [3]			53,945 ha (765 properties)
Dairy cattle agistment/fodder [4]			54,853 ha (759 properties)
Total hectares (ha) [5]		238,071 ha (2843 properties)	235,518 ha (2666 properties)

Dairy water ownership

Respondents feedback (Stage 2)

High Reliability Water Share at present	%
0 ML	4.2
1-50 ML	11.1
51-100 ML	5.1
101-200 ML	10.3
201-500 ML	36.8
501-1000 ML	22.2
More than 1000 ML	10.3

30.7% own less than 201 ML HRWS including 15.4% owning less than 50ML HRWS

I have the amount of water entitlement to irrigate my property that I require	%
Disagree	73.5
Undecided	5.3
Agree	21.2

Allocation trade

Reliance on allocation trade to manage irrigation	%
No or little reliance	31.4
Some reliance	19.5
Large reliance	49.2
Allocation trade affecting the ability to make profit	%
Negative impact	67.0
No impact	23.9
Positive impact	9.2
Current price affected water purchase and selling decisions ($230/ML mean, 2015/16)	75.3
Allocation trade affecting the ability to plan and implement water budget	%
Negative impact	65.1
No impact	25.7
Positive impact	9.2
Allocation trade affecting ease of operation	%
Negative impact	64.2
No impact	28.4
Positive impact	7.3

Barriers to change

Barriers to changing irrigation practices	Dairy 2015/16 %	All irrigators 2015/16	All irrigators 2004/05
Inadequate water quality	12.4	13.8	2.3
Uncertainty of water allocation	63.6	53.9	47.1
Lack of financial resources	57.0	52.6	50.2
Lack of time	21.5	21.1	20.0
Insufficient or inadequate information	6.6	7.6	3.6
Doubts about likely success	10.7	9.4	12.1
Age or poor health	11.6	17.7	12.9
Inadequate water availability	52.9	46.1	19.3
Connections/outlet modernisation	20.7	26.3	N/A

What does it all mean?

- The overarching picture is that dairy maintains a strong profile in the GMID. This is good news for the northern Victorian economy and communities.
- But industry resilience is wearing thin with falling production, less water being used and more exposure for farmers to a volatile water market with higher prices.
- The ability of dairy farmers to withstand climate and commodity volatility is compromised by less water being available, higher water prices and now, increased competition from downstream industries such as nuts and cotton.
- While dairy farmers are able to flex production systems to cope with seasonal and market volatility up to a point, they can't do so at a profit; milk production is still closely linked to water availability and affordability.
- Therefore, the GMID dairy industry is especially vulnerable to any further reduction in water available for production in the southern Basin.
- It is also highly vulnerable to dairy farmers exiting the industry and selling their water entitlements to non-dairy enterprises. This reduces the capability of remaining farmers to expand and offset the production losses.

Solutions

Murray-Darling Basin Plan

No more water recovered from the irrigation pool, whether through buybacks or on-farm works requiring transfer of entitlements in return.
Note: Basin Plan's 2750GL is already met, provided full 650GL in environmental offsets is achieved, and all current projects deliver the contracted savings. The 450GL 'upwater' cannot be delivered with neutral socio-economic effect – effects will be adverse.

Government investment in on-farm upgrades as a structural adjustment measure, without requiring irrigators to give up water entitlement in return.

Develop a regional economic development plan to attract new agricultural investment to the GMID and retain HRWS in the region.

Dairy industry

Develop diverse and profitable farming systems that are less reliant on irrigated pasture and better able to flex in response to the volatility in water availability and affordability.

Rapidly accelerate the pace of farmers transitioning into these new production systems.

A market mechanism to capture HRWS sold by exiting dairy farmers, and retaining the allocations against those entitlements for purchase and use by those remaining.