



National Irrigators' Council

***Submission to House of
Representatives Standing
Committee inquiry into water use
efficiency in Australian
agriculture***

March 2017

Contact: Steve Whan
CEO: National Irrigators' Council

Contents

Executive Summary	3
Recommendations	5
Introduction	7
Adequacy and efficacy of current programs in achieving irrigation water use efficiencies ...	10
Are We Getting Efficiency Improvements?	11
Irrigation efficiency and energy costs.....	14
How existing expenditure provides value for money for the Commonwealth	15
Buy Back versus Infrastructure Investment.....	15
Current Programs in the Murray Darling Basin	17
Possible improvements to programs, their administration and delivery	20
Ensuring community impact is considered for future Basin Plan implementation	20
Constraints Management.....	20
Other matters, including, but not limited to, maintaining or increasing agriculture production, consideration of environmental flows, and adoption of world's best.....	22
National	22
Australian Government's Agricultural Competitiveness white paper	22
Investing in Irrigation: an ongoing role for Government	22
Supporting agriculture production, industry and jobs through accessible and affordable energy.....	23
Supporting agricultural competitiveness through red tape reduction.....	25
Murray Darling Basin	26
Environmental flows and complementary measures	26
Monitoring and evaluation of environmental water	26
About the National Irrigators' Council	29
Attachment A: National Irrigation energy productivity program	30

The National Irrigators' Council (NIC) is the national peak body representing irrigators in Australia. The Council supports twenty-nine (29) member organisations covering the Murray Darling Basin states, irrigation regions and the major agricultural commodity groups. Council members collectively hold approximately 7,000,000 mega litres of water entitlements.

The Council represents the voice of those involved in irrigated agriculture who produce food and fibre for Australia and significant export income. The total gross value of irrigated agricultural production in Australia in 2014-15 was over \$15 billion (ABS). The sector produces essential food such as milk, fruit, vegetables, rice, grains, sugar, nuts, meat and other commodities such as cotton and wine.

The Council aims to develop projects and policies to ensure the efficiency, viability and sustainability of Australian irrigated agriculture and the security and reliability of water entitlements. The NIC advocates to governments, statutory authorities and other relevant organisations for their adoption.

Executive Summary

National Irrigators' Council (NIC) appreciates the opportunity to provide this submission to the House of Representatives Standing Committee inquiry into water use efficiency in Australian agriculture. Much of the discussion in this submission focuses on the Murray Darling Basin, however NIC membership includes irrigation areas outside the Basin and we strongly support the enhancement and development of sustainable irrigated agriculture in all suitable parts of Australia.

It is hoped that through this inquiry the Committee will take a thoughtful view of the irrigated agriculture sector and the contribution it makes to the fortunes of Australia's rural communities and the Australian population more broadly, in food and fibre production. Stakeholders in irrigated agriculture feel, with some justification, that they and their communities have borne the brunt of many years of change and reform, and that their contribution to Australia's economy and the efficiency measures they have undertaken, have gone unrecognised by decision makers and the wider population.

It is also hoped that the Committee will come to recognise the negative socio-economic impact of further removal of Murray Darling Basin water from productive use for entire communities and for the nation overall. The Basin Plan must be balanced; it must consider the needs of people, communities and food and fibre production in parallel with the environment.

Water is the lifeblood of many rural communities. It underpins the irrigated agriculture sector, producing food and fibre for domestic consumption and significant export income for Australia.

The total gross value of irrigated agricultural production in Australia in 2014-15 was over \$15 billion, rising by 3%, or \$509 million on the previous year.¹ Irrigated agriculture plays a vital role in producing the food and fibre consumed by all Australians, as well as providing jobs and export income for the nation. It contributes to the living standards of every Australian, regardless of where they live, and supports the social and economic wellbeing of irrigated agriculture dependent communities, with flow on effects in jobs and downstream processing industries, with goods such as milk, fruit, vegetables, rice, grains, sugar, nuts, meat and other commodities like cotton.

Australian farmers have always been innovators; they have looked for solutions when faced with tough climatic conditions. Irrigators are no exception and over recent decades have overcome sometimes inefficient historical designs of irrigation districts to become more efficient. Those substantial efficiency improvements have been both Government and self-funded. Irrigators have embraced research and development and taken advantage of technological change and broadened their knowledge to improve their bottom line, while at the same time increasing their water use efficiency.

It could be argued that the sector is now a 'world's best practice' model producing more food and fibre, more efficiently.

We have long supported Government investment in infrastructure projects. In particular, investment in system improvements and in on-farm schemes, where water savings retained on farm enable significant broader benefit, including the contribution to the direct employment in the sector. Water left in production also enhances opportunities for the development and expansion of local industries, providing the social and economic underpinnings of irrigated agriculture communities.

¹ Australian Bureau of Statistics

In this context, some Government funding has enabled irrigators to make substantial improvements on-farm. This has enabled farmers to reduce the volume of water used per hectare, and 'to do more with less'. Benefits include:

- Delivering water savings to production to maintain and improve productivity
- Diversifying and/or expanding their operations into existing and other commodities
- Network wide savings above on-farm savings due to the volume of water being delivered
- By extension, supporting regional growth
- Return on investment in the management of river operations, where savings at the river level by way of works and measures, protect and enhance the productive pool, underpinning irrigated agriculture industries and regional development.

While on-farm upgrades deliver these benefits, the potential for a perverse outcome must also be recognised, where farmers' participation in programs requires transfer of water entitlement to the environment, which results in socio economic and water market implications that can impact all irrigators. This is due to the entitlement transfer effectively further reducing the total pool of water available for irrigation, on top of buybacks, and puts upward pressure on prices on the temporary market.

It would be a flawed approach to continue to allocate funds to purchase water without a genuine examination of the value of complementary measures. NIC has advocated for greater effort to be directed to this task, to consider the development of a suite of non-flow, or complementary, measures.

This approach was also proposed by the Northern Basin Advisory Committee (NBAC) as part of the Northern Basin Review. It is pleasing to note that at their recent meeting in March, Basin Ministers reiterated their earlier request for officials to consider opportunities for a wider range of complementary projects to provide 'triple bottom line' benefits under the Basin Plan. These include:

- carp control through the release of the Carp Herpes virus
- appropriate management of cold water pollution
- improvement of fish migration through fish-ways
- restoration of native fish habitat
- feral animal and weed control in wetlands and riparian areas
- increased ability for Commonwealth Environmental Water Holder (CEWH) to trade water.

The opportunity exists to continue to progress a range of efficiency gains, for example, within the Sustainable Diversion Limit (SDL) adjustment mechanism in the Murray Darling Basin, and in other areas consistent with the National Water Initiative (NWI) policy framework.

NIC advocates a 'triple bottom line' approach, arguing that success is reflected in outcomes, not simply reaching gigalitre (GL) targets embedded in a model. At the inception of the Basin Plan, NIC argued that the strategy in the Murray Darling Basin of just adding water was flawed, and that it would have major impacts on producers and communities and fail to produce desired environmental outcomes.

Recommendations

Recommendation 1: *The Committee note the role of irrigated agriculture in the task of supplying food and fibre to Australians and by generating export revenue to the living standards of all Australians – particularly in regional communities. The committee agrees that irrigated agriculture has a key role to play in meeting Australia’s aim of helping to meet growing demand for food and fibre in Asia. To do that Australia will need to see a growth in productivity driven in part by a growth in sustainable irrigated agriculture in existing and new irrigation districts.*

Recommendation 2: *The Committee note that significant progress has been made on achieving the goals for return of water to the Murray Darling Basin and while recognising significant challenges remaining in implementing the remaining stages of the Plan, acknowledges that irrigators and irrigation dependent communities have made a significant contribution to progress to date.*

Recommendation 3: *The Committee acknowledges that most of Australia’s irrigation companies and irrigation farmers are at, or pursuing best practice, and are among the world’s most efficient and productive irrigators.*

Recommendation 4: *The Government introduce, through ARENA (Australian Renewable Energy Agency), a national irrigation energy productivity program. The proposed \$250 million program would comprise R&D, demonstration pilots, extension and outreach, and training for service providers, linked to a capital fund that farmers can access for new infrastructure. In a variation from existing ARENA programs, funding criteria would embrace the portfolio of measures required to optimise energy productivity and sustainability and would not be restricted to renewables. Funded works would include digital control systems, pump and layout optimisation and hybrid energy solutions (eg network energy supplemented by solar). The program would also cover energy planning for irrigation districts to identity demand management, load shifting and distributed generation opportunities.²*

Recommendation 5: *The Committee agree with the legislated 1500 GL cap on buybacks and does not support further buybacks to achieve Basin Plan goals.*

Recommendation 6: *The Committee urges Basin governments and the MDBA to ensure that SDL offset measures are secured to achieve the full 650GL in offsets available consistent with the Murray Darling Basin Plan.*

Recommendation 7: *The Committee recommend that the COFFIE Program (Commonwealth on-farm Further Efficiency Irrigation), in its current form, be discontinued and that further consultation occur with industry and Basin communities about more effective and better targeted ways to utilise the funds.*

Recommendation 8: *That the Committee endorse the resolution from Basin Ministers and recommend that efficiency measures aimed at meeting the 450GL ‘up-water’ goal only proceed if they are able to meet the original commitment that they either improve, or have no negative impact on, communities as determined by a more thorough community impact test.*

Recommendation 9: *The Government recognise that there is an ongoing role for National programs (separate to programs designed to achieve Murray Darling Basin objectives) to fund new irrigation infrastructure and on and off farm efficiency programs in existing irrigation areas. The efficiency aspects of these programs could involve part funding of projects with 100% of water saved able to be retained for increased agricultural production.*

² Agriculture Industries Energy Taskforce

Recommendation 10: *To address the impact of high energy costs on viability of agriculture, NIC recommends:*

- *A 30% reduction in the regulated electricity prices based on the 2014-15 financial year*
- *A medium to long term price averaging 8 cents per kilowatt-hour for the electrons and 8 cents per kilowatt-hour for the network.*
- *A rule change via the Australian Energy Market Commission (AEMC) to change the way electricity networks' regulated asset base (RAB) is calculated.*
- *A national food and fibre tariff model.*
- *A water energy productivity program designed to fund and accelerate the adoption of energy solutions*
- *Fundamental reform of the National Electricity Market (NEM) to address the lack of genuine competition, the operation of the bidding process and a market where consumers' interests are fairly represented.*
- *Stability and certainty in national energy policy to allow investment.*

Recommendation 11: *The Committee supports the Government's continued commitment to reduce red tape for the agriculture sector*

Recommendation 12: *The Committee supports the agreement of Basin Water Ministers to continued development of a method for assessing the benefits of embedding complementary measures as a key element of achieving Basin Plan outcomes.*

Introduction

The Murray Darling Basin Plan has attracted much attention over the last decade both within Government and in the minds of those who think about irrigation and rivers. Measures in the Basin Plan are only a part of the irrigation picture; there are many other irrigation districts in Australia, all combining to make a vital contribution to Australia's food and fibre for domestic and export consumption.

Irrigation is a critical driver of Australia's future potential to supply food and fibre, of jobs and of regional development. It also plays a key role in meeting the ever-increasing global demand for Australia's clean, green produce. Well managed and efficient irrigation and storage can also play an important role in responding to climate change.

This submission broadly addresses issues within the Murray Darling Basin, principally due to the current focus on the Basin Plan, irrigated agriculture and related policy. However, that should not be allowed to create the impression that the debate is all about shrinking irrigation – far from it.

It is in Australia's national interest to ensure a policy focus that underpins our capacity to produce more food and fibre through irrigated agriculture. That means within the Murray Darling Basin with its existing highly efficient and environmentally sustainable irrigation schemes and in other parts of Australia through expansion and new development.

The committee has the opportunity to make a strong statement which reinforces the irrigation sector's key role in helping Australia to fulfil its potential to be a 'food bowl' for the region, and which helps to resolve the sometimes-contradictory and negative messages.

The Australian Government has recognised the importance of food and fibre production for Australia's future with its strong focus on bilateral and multilateral trade agreements, with each placing export of food and fibre at the forefront.

The 2012 Australia in the Asian Century white paper noted the real value of global food demand is expected to rise by around 35 per cent by 2025 from 2007 levels, with most demand coming from Asia. China and India alone could account for almost 60 per cent of the global increase.³

The white paper related studies and the subsequent work by the Government highlight that key among the potential areas for growth are exports of fruit and vegetables and dairy, two key irrigated products.

Food and agribusiness has been consistently touted by Government as one of the key super growth areas for Australia's future. That is reflected in the fact that it is one of the few industries to have its own Industry Growth centre program. This is not simply about growing food and fibre, the industry (particularly the irrigated industry) is also about manufacturing, with the strong potential to be a growth driver for manufacturing jobs.

As Australia's population continues to grow, demand for Australian irrigated agricultural product will also continue to grow.

³ <http://pandora.nla.gov.au/pan/133850/20130914-0122/asiancentury.dpmc.gov.au/sites/default/files/white-paper/case-study.pdf> P.214).

The Australian Food and Agribusiness Growth Centre quotes figures for the food and agribusiness sector overall showing that:

- Total sales and services income of \$164 billion (equivalent to 5.9 per cent of all Australian industries in 2013-14)
- Industry gross value added in 2014-15 (or 3.5 per cent of the total of all industries)
- Exports of \$40.8 billion representing 16.3 per cent of all Australian exports in 2014-15 ⁴

ABS statistics indicate that irrigated agriculture is already worth \$15 billion to the Australian economy. As Australia drives toward producing more to meet that massive growth in Asian demand for fresh 'clean green' food, it will need to produce more per hectare and that will often mean irrigating crops.

It should be absolutely clear that without a healthy, efficient and, importantly, growing irrigated agricultural sector, Australia will not reach its potential to meet that increased demand and thereby, generate jobs and higher living standards for Australians.

The irrigation sector recognises, and indeed has been a driver of, the importance of achieving greater productivity using far less water.

Recognition of the need to improve the coordination of water management and water use efficiency in Australia is broadly embedded in many of the significant policy frameworks over recent decades.

Historically, the collaboration between the Australian Government and the states and territories under the National Water Initiative (NWI), signed in 2004, recognised the need to support healthy working rivers and groundwater systems. It also recognised the need for investment to maximise the economic, social and environmental value of Australia's water resources. The NWI, which followed the 1994 COAG framework for water reform, involves reforms such as improved water planning, water trading and water accounting.

The Commonwealth Water Act 2007 gave the Bureau of Meteorology and the Murray Darling Basin Authority (MDBA) responsibility for a national focus on water management in the Murray-Darling Basin. When the Basin Plan was first conceived, communities understood the principle that some water would be returned to the environment for the broader benefit, including to ensure sustainable extraction into the future. The process of water recovery however, commenced prematurely in 2009, before the Basin Plan had been finalised and established what the valley based sustainable diversion limits or the environmental flow targets would be.

Since the commencement of the Basin Plan, NIC has argued the case for a balance between social, environmental and economic outcomes to ensure the Plan is fair and workable. Without this objective, communities will continue to face the consequences of an unsatisfactory Plan. Our commitment remains to genuine reform, but not at the expense of a viable, productive irrigated agriculture sector in Australia.

The trajectory of reform under the Basin Plan has traditionally been heavily biased towards water as the only environmental management solution to address environmental decline in our river systems. The Basin Plan was designed to deliver long-term sustainability of agriculture and the environment, yet delivering just volume of water is taking precedence over the welfare of people, communities, food and fibre production, and often overall actual environmental outcomes.

⁴ https://fial.com.au/system/files/knowledge_repository/FIAL-AnnualReport-2016-Public.pdf

Our members are committed to triple bottom line outcomes; they depend on the health of river systems for their operations and on the social, economic and environmental contribution this makes to their regional communities.

During the development of the Basin Plan, NIC raised concerns around the social and economic dislocation the recovery of 2750 GL of long term cap equivalent water would unleash on communities across the Basin. Community resilience has eroded as historic reforms take their toll and undermine the capacity of people to continue to adapt to change through the Basin Plan implementation.

The recent review of the Northern Basin by the MDBA clearly demonstrated the socio-economic impacts on communities in the north, where towns like Collarenebri, Dirranbandi and Warren (in particular) have paid a high price in jobs and economic activity for water recovery. Assurances were given during the development of the Basin Plan that a 'whole of government' approach would be taken to respond, where there was a need for structural adjustment because of the Basin Plan. The expectation is that the Government will honour this commitment and extend to communities beyond those noted in the Northern Basin review.

Independent studies conducted to inform the development of the Basin Plan showed that buybacks have greater localised negative social and economic impacts on irrigation dependent communities than investment in water efficiency projects.⁵ Past Governments' 'no regrets' water buyback regime was ill-considered and is leaving a social and economic legacy that will need to be addressed.

NIC and Basin Communities argue that the broad socio economic impact means there should be broader and more comprehensive adjustment funding made available. We note that the Government recently announced a commitment of \$72.656 million as part of the Murray-Darling Basin Regional Economic Diversification Program (MDBREDP) to assist Basin communities increase economic diversification and adjust to a water constrained environment. The Basin States of New South Wales, Victoria and Queensland identify and manage projects within their jurisdictions.

While this is welcome, NIC would still argue that recognition of negative impacts is still lacking and that structural adjustment programs will need to be a feature of future implementation of the Basin Plan. Given the committee's terms of reference the recommendations in this submission have a narrower focus.

Water recovery should not focus solely on privately held water entitlement; it must also examine operational efficiency of the 74% of water flows in the Murray Darling Basin already allocated to the environment (inclusive of environmental holdings and base river operation flows which have environmental implications). Priorities should continue to focus on works and measures and efficiency projects identified under the localism model.

It is estimated that contracted water recovery in the Murray–Darling Basin, as at 31 December 2016, is 2,038.5 gegalitres (GL), or 74.1% of the way toward meeting the 2750 GL surface water recovery target outlined in the Basin Plan. It was disappointing that the study used to provide a baseline and

⁵ See for example Arche Consulting (2011) *Assessing the local economic impacts of the draft basin plan - Final report Prepared for the Department of the Environment*. <http://www.mdba.gov.au/sites/default/files/archived/proposed/Arche-Basin-Case-Studies-final-report.pdf> and RMCG (2013) *Cost Benefit Analysis of Farm Irrigation Modernisation Final Report, prepared for Dairy Australia* <http://www.dairyaustralia.com.au/~media/Documents/Industry%20overview/About%20the%20industry/Current-industry-issues/LMDB%209/RMCG%20CBA%20OnFarm%20Irrigation%20Efficiency%20Program%20May%202013%20DOC1357415.PDF>

justify the need for the Basin Plan, the Sustainable Rivers Audit – designed to be replicated over the long term to continually monitor ecological conditions – was one of the first activities cut by the MDBA when faced with budget cuts. Therefore, new monitoring and surveys are not immediately comparable to the baseline. Communities must be afforded access to the evidence around how the water recovered for the environment will be used, where it will be directed and for what purpose. The Australian public must also be satisfied that there is value in their investment in water purchase.

Various programs to date including those associated with the Basin Plan, the Living Murray and Water for Rivers, have seen a significant quantity of water returned to the environment through a combination of efficiency works and water purchases. That includes 2400 GL currently held by the Commonwealth Environmental Water Holder (CEWH) and 212 GL returned to the Snowy River.

It is important to acknowledge the significant contribution of irrigators and irrigation communities towards the return of water to the environment as a major achievement as part of the objectives of the Basin Plan.

The Committee has an opportunity to take stock of the effectiveness of programs running to date, Australia wide, as well as in the Murray Darling, and examine how future programs can be effectively implemented. In particular, the Committee is undertaking this inquiry at an important juncture in the Murray Darling Basin Plan implementation process. It is important on one level to acknowledge the progress that has been made to date, but to learn from the implementation to ensure that the Plan is able to be finalised without significant negative impacts on communities and on Australia's capacity to produce competitively priced fresh food and natural fibres.

***Recommendation 1:** the Committee note the importance of irrigated agriculture to the task of supplying food and fibre to Australians and by generating export revenue to the living standards of all Australians – particularly in regional communities. The Committee agree that irrigated agriculture has a key role to play in meeting Australia's aim of helping to meet growing demand for food and fibre in Asia. To do that Australia will need to see a growth in productivity driven in part by a growth in sustainable irrigated agriculture in existing and new irrigation districts.*

***Recommendation 2:** the Committee note that significant progress has been made on achieving the goals for return of water to the Murray Darling and while recognising significant challenges remaining in implementing the remaining stages of the plan, acknowledges that irrigators and irrigation communities have made a significant contribution to progress to date.*

Adequacy and efficacy of current programs in achieving irrigation water use efficiencies

Investment made in irrigation efficiency programs on and off-farm is helping to further improve Australia's highly productive and efficient irrigated agriculture sector. The inquiry's terms of reference focus on programs put in place by Governments to improve water use efficiency. Many of these federal programs have been in the Murray Darling Basin; but programs have also delivered outside the Basin and by state governments.

These programs have had a positive long term impact when they are well-designed and targeted. In those cases, schemes have the capacity to contribute significantly to productivity and to generate ongoing economic activity.

Some experience though has not been positive. Poorly designed programs for on-farm efficiency can have detrimental impacts on the viability of irrigation schemes with a negative flow on effect for a community. This is discussed in more detail later in this submission.

Water use efficiency has been driven only in part by Government investment in efficiency programs. Industries too, including individual farmers, irrigation infrastructure operators and industry led groups have made significant direct investment in infrastructure and works and measures, research and development, and via market driven decisions about the best use of valuable water.

One of the paradoxes of the drive to more efficient water use has been that, in many areas, this has meant greater use of power, and now soaring electricity prices and a dysfunctional energy market, are undermining the sustainability and viability of many irrigation operations. This is also discussed in more detail in this submission.

Are We Getting Efficiency Improvements?

NIC contends that the on the ground evidence shows conclusively that Australia is gaining the benefit of increasingly efficient use of water for irrigated production, and the sector should be acknowledged as being among the most efficient and productive users of water in the world.

The on the ground evidence comes from the quantity of production versus the amount of water used on crops. Farmers and Irrigation Infrastructure Operators (IIOs) know how far their water is going because they pay for every litre.

It is often difficult, however, to rely on figures that give an overall assessment of efficiency, for example measuring the number of litres of water used per hectare. The problem is that year on year comparisons can change dramatically depending on how much irrigation water is available in a year or what is being produced.

It does not necessarily follow that in a dry year water use per irrigated hectare will reduce. The number of irrigated hectares will reduce but the hectares that are left will generally require more water because they are supporting permanent plantings like almonds. ABS statistics provide informative, but limited, evaluation. The ABS started publishing statistics on irrigation for 2002-03. Those first national figures told us that irrigation use was 4.4ML per hectare; by 2014-15 that figure had dropped to 4.2ML per hectare. At the same time the number of hectares irrigated dropped. What we don't see in those figures is any assessment of the productivity of those hectares. Evidence from industry is that farmers have significantly improved their per hectare product over that period through a combination of some of the initiatives outlined in this submission.

The other factor which makes year on year comparison difficult is that the mix of uses of the water changes over time. Almonds, for example, are a rapidly expanding and valuable crop but they use substantially more water than some alternatives.

It is difficult to contest a few clear facts about the irrigation in the Murray Darling Basin for example. We know that over the last decade the area irrigated has reduced, we know that productivity of key crops and products has increased and we know that the Environmental Water Holder now holds 2400 GL per year, not previously held.

It is useful therefore, when considering efficiency, to look at individual industries (NIC would be happy to assist the Committee to visit relevant regions and/or engage the relevant industries to discuss their specific efforts to implement water use efficiency measures):

In Australia's cotton industry, a dedicated effort on research, with the assistance of the Cotton Catchment Communities Cooperative Research Centre (Cotton CRC), has supported the industry's goal to produce more cotton per unit of water used. The use of the latest technology and up to date on-farm practices is enabling the Australian cotton industry to produce Australian cotton fibre that is farmed with less water per hectare than before.

Water use efficiency and productivity in the Australian cotton industry has been measured as part of several studies in the past twenty years. The industry has achieved a 40% increase in water productivity over the last decade, now producing 'more crop per drop' than other nations, and two and a half times the world's average yields.

Industry research identified five key areas for water use efficiency:

- Maximising storage and distribution efficiency (on-farm dams and channels)
- Maximising application efficiency (putting water on the crop)
- Achieving uniform application (putting water on the crop)
- Monitoring water use and calculating efficiencies (while the crop is growing)
- Alternative irrigation systems (where applicable) such as overhead sprinklers, bankless channels and drip ⁶

Over the past ten years, Australia's rice farmers have improved water use efficiency by 60%, growing more rice with less water. Research shows that Australian growers use 50% less water to grow one kilo of rice than the world average. With a focus on improving water use, in recent years, farmers are required to:

- Follow strict regulations for the growing of rice
- Undergo whole farm planning techniques
- Grow shorter season rice varieties which require less water for growth
- Plant another crop into the rice stubble to utilise the soil moisture
- Attend regular discussion groups to learn new techniques and maintain best practice
- Observe Land and Water Management Plans:
 - establish best practice for managing irrigation farming and improving water and soil management.
 - provide for long-term biodiversity restoration and better farm management techniques, so the land is preserved for future generations.⁷

Individual case studies in the dairy industry provide examples of how dairy farmers are taking advantage of programs in Victoria to deliver water efficiency gains. For example, a dairy farmer at Cohuna sought to automate irrigation on his property and applied for funding under the Farm Water Program (FWP), a consortium of state and regional Victorian partners and led by the Goulburn Broken Catchment Management Authority. The farmer noted that the project exceeded expectations and resulted in an increased milking of cows, up from 180 to 260 cows.

⁶ Cotton Australia

⁷ Ricegrowers' Association of Australia

The farmer also noted the program provided increased flexibility, water savings, and better feed production using less labour. Interestingly, he also noted that the 'drawback' was that power costs had increased from \$5 per MG of water to \$15 per MG.

A further case study in Victoria shows how a grain and feed producer commenced laser and channel work on his farm through the Commonwealth On-Farm Irrigation Efficiency Program (OFIEP) when it became available in 2010. The producer noted a '*completely reinvigorated local region and a new lease on life*'. At the same time, modernisation work on nearby channels had been carried out as part of the Northern Victoria Irrigation Renewal Project. Through connections upgrades, the producer observed that he had '*moved from getting 5-6 MG through the wheel to 20 MG*'. The outcome was that watering that had taken days was now taking just hours. As part of the works, he could plant Lucerne and some sorghum and noted that faster watering had assisted his efficiency. Combined with the work completed in the bays and channels, around 98% of any run-off had gone into those.

Dairy Australia provides data on case studies⁸ developed through the FWP. While it is a state program, data demonstrates that a modernised farm, connected to a modernised supply system⁹ and continuing with the same crops as previously, can achieve:

- A 2 ML/ha water saving (from an average 12 ML/ha down to 10 ML/ha, an 16% saving) (Water saving range across all FWP projects: 0.5ML/ha – 3.6 ML/ha).
- Increased pasture yield of 2.2 tonnes of dry matter DM per hectare (from an average 11 tonnes DM/ha up to 13.3 tonnes DM/ha, a 20% gain) (productivity range 0 – 7 tonnes DM/ha).
- An 0.4 tonnes DM increase per megalitre of water used (from an average 0.9 tonnes DM/ML up to 1.3 tonnes DM/ML, a 44% increase) (productivity range 0 – 1.1 tonnes DM/ML)
- An average \$300 per modernised hectare increase in gross margin (range \$0/ha -- \$600/ha)
- Labour savings of \$140 per hectare (at \$25/hr) (range \$0/ha to \$400/ha).

Total additional annualised cost per upgraded hectare is an average \$500/ha (range \$200/ha -- \$1000/ha). Additional annualised benefit per upgraded hectare is an average \$700/ha (range \$200/ha to \$2000/ha). The Net Present Value per hectare of the upgraded system was \$2000 (range -\$2000 to \$18,000). The NPV accounts for the effective life of the system over 30 years, including water savings and benefits. The result is a benefit-cost ratio of 1.5 (range across all case studies 0.6 to 3.5). Challenging misleading claims: There are some who seek to suggest, even in the face of actual water recovery, that efficiency of water use is not improving. ANU Water Economics Professor Grafton recently claimed, 'little to show' for the money spent on the Murray Darling Basin (MDB) plan.

Professor Grafton claimed the average volume of water applied per hectare [was] virtually the same in 2014–15 as it was in 2002–2003. As mentioned above the publicly available ABS figures do not show the MDB for 2002-2003. The first year of ABS statistics for the MDB is 2005-06, when there was 1,654,000 ha of irrigated land in the MDB, and 7,369,807 ML of water was used at a rate of 4.5 ML/ha. In 2014-15 there was 1,366,738 ha of irrigated land, 5,868,785 ML of water used at a rate of 4 ML/ha. That represents a significant reduction, particularly when we consider that 2014-15 represents only the 2nd year of the Plan.

As mentioned above it is important in year on year comparisons to ensure that there is some adjustment for climatic conditions. For example, Murrumbidgee Irrigation Ltd in 2002-03, General Security users received 38% and in 2014-15, received 53% of their entitlement.

⁸ '2016 - February - Farm Water Program - Case Studies - All Rounds - Summary'

https://www.gbcma.vic.gov.au/publications/published_documents/farm_water_program#casestudies. Accessed 24 March 2017.

⁹ Pers. Comm Charles Thompson, FWP evaluation consultant for GBCMA.

Some of the argument advanced by Professor Grafton and Professor Williams in their submission to this inquiry are also interesting. NIC has no argument with definitions of evaporation being an outflow or a loss, except to point out that evaporation also occurs during environmental watering just as it does on agricultural land. NIC is also intrigued by the Professors' argument on irrigation efficiency and decreased run off from farms, where they appear to suggest reducing run off has negative impacts. Irrigators would suggest that was in fact an indicator of good economic management from farmers and that given the high prices they now pay for water, they cannot be expected to pay for water that is excess to their productive requirement.

Recommendation 3: That the committee acknowledge that most of Australia's irrigation companies and irrigation farmers are at, or pursuing best practice, and are among the world's most efficient and productive irrigators.

Irrigation efficiency and energy costs

The water energy nexus is well documented globally.¹⁰ Water efficiency in irrigation is often achieved by piping irrigation networks and pressurising delivery, ideally regulated using smart, automated control systems. Operating such systems, however, entails far higher energy usage than flood and other gravity based systems.

State and federal governments have invested billions in water efficiency programs without addressing the energy part of the equation. We argue that a national irrigation energy productivity program funded by ARENA (Australian Renewable Energy Agency) is needed to develop and incentivise adoption of irrigation systems that optimise both energy and water usage. In addition to increasing energy and broader agricultural productivity, the program would help reduce pressure on national bulk water resources, and in so doing may reduce water allocation conflict in the Murray Darling Basin and other irrigation catchments.¹¹

NIC recognises that there are other inquiries, both Parliamentary and external, that are looking at power prices, however there is a need for a specific agriculture focus which this inquiry can provide. We discuss energy challenges for the sector under the final term of reference.

Recommendation 4: The Government introduce, through ARENA, a national irrigation energy productivity program¹². The program would comprise R&D, demonstration pilots, extension and outreach, and training for service providers, linked to a capital fund that farmers can access for new infrastructure.

In a variation from existing ARENA programs, funding criteria would embrace the portfolio of measures required to optimise energy productivity and sustainability and would not be restricted to renewables. Funded works would include digital control systems, pump and layout optimisation and hybrid energy solutions (eg network energy supplemented by solar). The program would also cover energy planning for irrigation districts to identity demand management, load shifting and distributed generation opportunities. {Agriculture Industries Energy Taskforce¹³}

¹⁰ Optimal water efficiency in irrigation is often achieved by piping irrigation and pressurizing, ideally regulated using smart, automated control systems. Operating such systems entails higher energy usage than flood and other gravity based systems.

¹¹ NSW Farmers' Association

¹² See attachment A

¹³ Agriculture Industries Energy Taskforce: National Irrigators' Council, NSW Irrigators' Council, NSW Farmers Assn, Cotton Australia, National Farmers' Federation, Bundaberg Regional Irrigators Group, CANEGROWERS, Winemakers' Federation of Australia, Queensland Farmers Federation, Central Irrigation Trust (SA).

How existing expenditure provides value for money for the Commonwealth

Not surprisingly, the answer to this question hinges on the fact that Government programs need to take into account full community impact and not just cost. NIC will focus in this section on the Murray Darling Basin though we would note that there are programs operating outside the Murray Darling that are expanding irrigation infrastructure.

The Government announced in the 2015-16 federal budget the provision to allow all primary producers to immediately deduct the cost of fencing and water facilities such as dams, tanks, bores, irrigation channels, pumps, water towers and windmills.

Buy Back versus Infrastructure Investment

The Murray Darling Basin Plan experience shows us that Government investment in water can take a number of forms, including infrastructure investment in improving the operation of rivers, irrigation systems, on farm investment in efficiency and purchase of water. It is now clear that the choice, and design of, which option to use can make a significant difference to the long-term viability of an irrigation region and to the irrigation dependent community.

The implementation of the Basin Plan has not been easy. It is however, possible to see areas where well targeted funding for infrastructure improvement has resulted in substantial gains in environmental water along with increased productivity from local schemes. It is also possible to see areas where poorly targeted buy backs and badly designed on-farm schemes have made the viability of entire irrigation districts questionable and put many producers close to a tipping point.

When looking at value for money from these various investments, it is important to look at more than just a simplistic litre for dollar return. Government has a responsibility to assess socio economic and long term impacts of its programs and this is one key area.

If you consider the simplistic litre for dollar equation, then Government would just go ahead and purchase water on the water market, thereby removing it from the productive pool. To do that on the basis of 'value for money' however, would be to completely ignore the responsibility of Government to the people it serves.

Investment in infrastructure is in the short term more expensive, but if well targeted and designed, it will avoid the massive negative impacts on communities and can produce long term gains for a region's productive capacity and product.

NIC supports achieving environmental gains, while minimising socio-economic impacts. As argued here, the adoption and implementation of complementary measures provides the pathway for genuine environmental gains while minimising social and economic pain. The recent review of the Northern Basin clearly demonstrated that the extent of environmental improvement has been marginal, and in some instances almost indiscernible. Yet, it is estimated that the recovery of 278 GL in the north to date, has come at a cost to the northern basin of \$139 million annually in lost farm-gate production. And based on a conservative 3:1 multiplier effect, this accounts for over \$400 million lost to Northern Basin communities annually. The projection is that the 278 GL already recovered has resulted in the loss of 450 jobs for those communities.

The negative consequences of purchasing water for the environment must be acknowledged. Direct purchase is advocated by some environmentalists as being the most cost effective way of meeting GL

targets. However, in recognition of the negative impacts of purchasing water, the Australian Parliament in 2015 legislated a 1500 GL cap on water buybacks, a measure advocated by NIC.

Some negative impacts of water purchase include:

- A smaller remaining pool of water in the market resulting in much higher prices for water, particularly in dry years.
 - Higher water prices push up the cost of production and have a direct impact on the viability of some producers
 - Producers growing high value crops will be able to afford to buy water in these circumstances while other lower value crops cannot; this would mean shifts in the volume and crops produced; the impact of this has been assessed in the Victorian Government's economic impact assessment.
 - Dairy producers and often rice growers, are likely to be priced out of the market in dry years and Australian production of these commodities is likely to significantly fall, driving up prices for consumers, and driving down Australia's international competitiveness.
 - Production of some horticultural products will become unviable, resulting in some permanent production ceasing.
- Untargeted purchases can result in previously irrigated properties in otherwise viable irrigation districts reverting to dryland production. The impact of this for those districts, is the so called 'swiss cheese' effect, where remaining irrigators are left to carry a larger proportion of the cost of operating the water delivery infrastructure.
- A reduction in the number of irrigated properties reduces overall productivity in an area leading to flow on loss of jobs throughout a community. The MDBA Northern Basin review showed that convincingly, in the socio-economic impact analysis which indicated the impact of the recovery of 278 GL in the north to date, as detailed above.

The socio-economic impact assessment undertaken by the MDBA in the Northern Basin should be seen as a game changer for the design of future schemes, representing as it does, an independent assessment by a body with a strong interest in making the Plan work. A range of other socio-economic assessments point to at least the same impacts, if not greater, resulting from removal of water. These assessments are particularly relevant when considering the remaining Murray Darling Basin Plan tasks, including the proposal to acquire an additional 450 GL of 'up-water'.

The Victorian Government funded an impact study conducted by TC&A with Frontier Economics. In part, it assessed what would happen to the horticulture sector during the next dry period and concluded:

'Under high future water recovery, there would be an additional shortfall of -241GL. This puts 20000ha of existing plantings, at risk, which represents \$381 million of existing investment.'

In the Goulburn-Murray Irrigation District, the TC&A with Frontier Economics report notes:

'The effective costs of delivering water will increase significantly unless up to 40% of the delivery system infrastructure in place before the GMW Connections Project began can be rationalised (GMW 2009). The spatially random nature of Commonwealth water purchases has contributed to the difficulty of rationalising infrastructure.'

Dairy Australia's consultants Aither concluded that:

'in a moderate' season the combined impact of Commonwealth Water purchase and changes in demand could be a 30% increase in the price of water by 2020-2021.'

They were less able to estimate the dry year impact but suggested that the price per ML could be up to \$702, a 55% increase (Aither P7). The study suggests that:

'isolating the effects of these (Commonwealth) purchases, allocation prices could be 13 to 36 per cent higher in a moderate allocation season such as 2014-15, than they would otherwise have been'

A review conducted for the Murray Goulburn area by RMCD group which included independent socio economic impact modelling and peer review concluded that:

'the reduction in the value of production across the GMID of \$580m per year and the loss of 1,000 jobs'.

In the longer term their conclusion is that the annual loss of production is around 15% with a value of \$550 million per year. If further targets are achieved via water buy backs, including via on farm schemes like the Commonwealth on-farm Further Efficiency Irrigation (COFFIE) Program, they conclude that the value of losses doubles again with that 15% drop in production carrying over to the Sunraysia and South Australian Irrigation areas.¹⁴

These socio-economic studies present one very consistent message. Removal of further productive water will result in a real loss of capacity for Australia to produce the fresh food and natural fibre we use domestically and that generates export income, and that it will produce loss of jobs, loss of income and flow on impacts right through Basin communities.

For those reasons NIC strongly opposes any further direct removal of water through buy backs and rejects on farm programs which fail to take into account the broader community impact.

Recommendation 5: The Committee agree with the cap currently in place on buybacks and does not support further buybacks to achieve Basin Plan goals.

Current Programs in the Murray Darling Basin

NIC has closely monitored progress on the Sustainable Diversion Limited (SDL) Adjustment Mechanism, where activities to be considered under the mechanism will either allow equivalent environmental outcomes to be achieved with less water, or increase the volume of water available for environmental use with neutral or improved socio-economic impact. These are referred to as supply and efficiency projects. Objectives must be maximised through the building and/or upgrading of existing, environmental supply measures, with a focus on projects under the localism model. If these objectives can be achieved, then the SDL adjustment mechanism should be an ongoing process to identify where new and effective supply contingencies can be achieved into the future.

SDL adjustment projects include environmental works to manage weir pools more naturally, better targeting of environmental watering of flood plains or wetlands and better management of rivers or storages. It is in the interests of the health of the river, Basin communities and irrigators to see these implemented and fairly accounted for in the implementation of the Basin plan.

Under the SDL adjustment mechanism, each Basin state will submit proposed projects for preliminary approval by 30 June 2017. They contribute a benefit to the operation of river systems and achieve environmental outcomes. If the full 650 GL is achieved, effectively no further productive water needs to be acquired to achieve the 2750 GL target.

¹⁴ RMCD Consulting, *Basin Plan GMID Socio-economic impact assessment*, Oct 2016

The SDL adjustment mechanism independent stocktake report released by the Murray-Darling Basin Ministerial Council in August 2015 found a supply contribution of around 500GL towards achieving 650GL under the adjustment. This was a welcome progress report, and at that time NIC argued for flexibility around timeframes and process to enable any additional projects to be completed and submitted for assessment beyond the 30 June 2016 timeframe. At the April 2016 Basin Water Ministers meeting, a request was made to the Commonwealth to amend the Basin Plan to provide for a second SDL adjustment step by 30 June 2017. This would make provision for a second tranche of projects to be developed to further improve the outcomes of the Basin Plan, a decision welcomed by NIC.

Most recently at the March 2017 Basin Water Ministers meeting, Ministers were informed by the MDBA that the SDL adjustment mechanism is on track to maximise the offsets outcome. Basin governments will settle the details of the package of measures in time for the Ministerial Council to make a decision regarding a second notification in June 2017. The MDBA will make its final determination of the SDL adjustment by 15 December 2017.

SDL adjustment initiatives will directly enhance the health of the Murray Darling system and enable environmental outcomes to be achieved. It is critical the projects are approved and there should be no suggestion that their approval should be dependent on achieving the additional 450GL up-water target.

Recommendation 6: The Committee urges Basin governments and the MDBA to ensure that SDL offset measures are secured to achieve the full 650GL in offsets available consistent with the Murray Darling Basin Plan.

The Sustainable Rural Water Use and Infrastructure Program (SRWUIP) is a national program investing in rural water use management and efficiency. It includes improved water knowledge and water market reform and water purchase for the environment. SRWUIP is the key mechanism to 'bridge the gap' to the sustainable diversion limits (SDLs) under the Basin Plan and includes three key components:

- irrigation infrastructure projects
- water purchase measures
- supply measures

The majority of SRWUIP infrastructure funds are committed to projects in the Murray-Darling Basin for improving the operation of off-farm delivery systems and helping irrigators improve on-farm water use efficiency. Water savings from these projects are shared between the Australian governments for environmental use and irrigators for consumptive use. Investments include:

- planning, investigations and project design
- works on off-farm irrigation systems
- works on farms to improve water use efficiency
- works to improve ecological health and restore natural flows
- water saving municipal projects
- water purchase through the Commonwealth purchasing program
- environmental works and changes to river operations that enable the same environmental outcomes to be achieved with less water.

Amendments to the Water Act 2007, which commenced in June 2013, allow recipients of payments from eligible SRWUIP projects, to choose to make water infrastructure improvement payments non-

assessable non-exempt (NANE) income, with expenditures matched by those payments non-deductible and to disregard any capital gain or loss from related transfers of water rights.

Our previously raised concerns remain, in relation to funds being removed from the \$5.8 billion committed for the SRWUIP, and directed towards initiatives not related to the aims and objectives of the Program, leaving an amount of around \$3.4 billion to recover water through infrastructure upgrades.

The On-Farm Irrigation Efficiency Program (OFIEP) is part of the Sustainable Rural Water Use and Infrastructure Program. The \$626 million OFIEP is assisting irrigators within the southern connected system of the Murray–Darling Basin to modernise their on-farm irrigation infrastructure while returning water savings to the environment.

The southern connected system encompasses the New South Wales Murray, Victorian Murray, South Australian Murray, Campaspe, Murrumbidgee, Goulburn, Broken, Loddon and Lower Darling (south of Menindee Lakes) river catchments.

The Commonwealth On-Farm Further Efficiency Program (COFFIE) program at a cost of \$1,575 million was developed to provide funding for irrigation infrastructure upgrades and other on-farm water efficiency activities. The COFFIE program is linked to achieving 450GL up-water. Under the program, irrigators transfer water savings from the project to the Commonwealth. Additional water savings are retained by the irrigator. The program is designed to allow water to be recovered to improve river health while maintaining or improving farm productivity.

NIC has not supported the program principally due to our long-stated opposition to the acquisition of an additional 450GL up-water until the existing 2750GL recovery target is met and until the 650GL under the SDL adjustment mechanism is achieved. The COFFIE program is an example of a poorly designed program that will lead to removal of water in an untargeted and inefficient manner leading to loss of viability for irrigation districts and flow on socio economic impacts for communities. The potential negative socio economic impact of this program has been highlighted in a number of the socio-economic impact studies noted here.

It needs to be clear that the commitment to the 450GL ‘up-water’ was accompanied by a promise from then Prime Minister Gillard and then Minister Burke, that they would ‘*ensure there is no social and economic downside for communities*’ and as established in the Basin Plan at Section 7.17 in relation to the socio-economic neutrality test. The current test in the Basin Plan under which the COFFIE program is assessed does not meet that promise.

NIC understands that a pilot of the COFFIE program is currently being run in South Australia and that as of the date of this submission only one grant had been taken up.

Recommendation 7: The committee recommends that the COFFIE program, in its current form, be discontinued and that further consultation occur with industry and Basin communities about more effective and better targeted ways to utilise the funds.

Possible improvements to programs, their administration and delivery

Ensuring community impact is considered for future Basin Plan implementation

NIC has argued that the socio-economic impact test must be improved for the efficiency projects as part of any spending on achieving 450 GL 'up-water'. Noting that the 450GL measure was an 'add on' to the Basin Plan, NIC's position remains, that there should be no acquisition of 450GL of 'up-water' until the existing 2750GL recovery target is met and until the 650GL under the SDL adjustment mechanism is achieved.

Recognising, however, that debate is likely to continue on the 450GL it is important to ensure that the 'game changing' implications of recent socio economic impact work are taken into account.

The current criteria for socio-economic outcomes in the Basin Plan at Section 7.17(2): *Neutral or improved socio-economic outcomes*:

- (b) The efficiency contributions to the proposed adjustments achieve neutral or improved socio-economic outcomes compared with the outcomes under benchmark conditions of development as evidenced by:
 - (i) the participation of consumptive water users in projects that recover water through works to improve irrigation water use efficiency on their farms; or
 - (ia) the participation of consumptive water users in projects that recover water through works to improve water use efficiency off-farm; or
 - (ii) alternative arrangements proposed by a Basin State, assessed by that State as achieving water recovery with neutral or improved socio-economic outcomes.

NIC contends that this test is completely inadequate being effectively a 'single person' test rather than a community impact test. In effect an individual's willingness to accept the money is the only community impact test this involves.

NIC is encouraged by recent developments from Basin Water Ministers who at their March meeting agreed to '*efficiency measures to recover an additional 450GL by 2024, consistent with the Basin Plan legal requirement to achieve neutral or improved socio-economic outcomes. Ministers also agreed to the terms of reference for an independent analysis of efficiency measures to ensure neutral or improved socio economic outcomes. This will report in December 2017*'.

It is critical that this work informs any decisions on achieving the 450GL 'up-water' target.

Recommendation 8: *That the Committee endorse the resolution from Basin Ministers and recommend that efficiency measures aimed at meeting the 450GL 'up-water' goal only proceed if they are able to meet the original commitment that they either improve, or have no negative impact on, communities as determined by a more thorough community impact test.*

Constraints Management

Progress on the Constraints Management Strategy (CMS) has been slow. The CMS is designed to identify and describe the physical, operational and management constraints affecting environmental water delivery and to unlock constraints to allow 450GL of 'up-water' (*over and above the 2750GL of*

water for the environment to be recovered in the MDB Plan) to be delivered for environmental objectives. NIC's position on constraints management remains:

- Water property rights must be protected or enhanced
- Characteristics of water entitlements should not be altered by ownership
- There should be no negative third party impacts on reliability or availability
- Potential negative impacts must be compensated or mitigated through negotiation with affected parties
- Irrigators must be fully and effectively engaged in the development of relevant policy
- Irrigators expect this measure to deliver triple bottom line outcomes.

The impact of flow rates is far from settled; assumptions are seriously compromised and not realistic, and it remains a concern that the flows promised for the environment under the CMS cannot be delivered. Local landholders know that under current modelling, damaging overbank flows will eventuate. NIC has raised this matter on numerous occasions with the MDBA, providing locational examples of natural flood events in the southern Basin in recent years and associated flow rates, and the overbank flows that occurred as a result.

This issue was on the agenda at the recent Basin Water Ministers meeting where it was agreed that impediments to delivering environmental water through constraints measures, be addressed.

Other matters, including, but not limited to, maintaining or increasing agriculture production, consideration of environmental flows, and adoption of world's best practice

National

Australian Government's Agricultural Competitiveness white paper

NIC supports the efforts of the Government in its Northern Australia focus to identify opportunities for development in irrigated agriculture.

Beyond the Basin Plan, the Commonwealth in conjunction with state and territory governments, landholders and water users, also manages water resources in the Great Artesian Basin, the Lake Eyre Basin under initiatives to support water efficiency. More recently, as part of the Australian Government's Agricultural Competitiveness white paper, the government established a \$509.5 million National Water Infrastructure Development Fund (NWIDF). Around \$209 million of this is for water infrastructure projects in northern Australia. The fund will support the future of farmers through water security. \$50 million of this will be allocated for the detailed planning necessary to inform future investment decisions. The remaining \$459.5 million will go towards constructing water infrastructure projects, in partnership with state and territory governments and the private sector.

The Government's focus on Northern Australia, with development under the Government's Agriculture Competitiveness white paper, has the potential for economic development based on agriculture and aquaculture, where access to suitable water resources could potentially support irrigated agriculture. This is underpinned by the significant rainfall received across large parts of Northern Australia, which broadly remains unused. Opportunities exist in the potential to build on the benefit of Australia's close proximity to Asian markets for agriculture, horticulture and aquaculture and to meet the increasing global demand for food.

As part of the white paper, the Northern Australia Water Resource Assessment conducted by CSIRO, will enable detailed analysis of the location of resources in the north, and support knowledge of the scale and nature of opportunities. Completion of detailed studies and data supports opportunities for investment. These initiatives are important measures in building on Australia's export performance to underpin our balance of payments, and flow on benefits to the living standards of all Australians.

Investing in Irrigation: an ongoing role for Government

As detailed here, increasing agricultural production (and productivity) needs to be a key focus for Australia to meet the very real potential for massive growth in export income from Australian food and fibre. Irrigated agriculture is key to meeting that potential with product grown in existing irrigation areas and in new areas.

Much of the focus on efficiency has been dominated by the Murray Darling Basin, but it is important to recognise the benefits of investment outside the Basin, following the implementation of the Basin Plan, to stay at world's best practice.

There is a legitimate and ongoing role for Government in investing in irrigation, in partnership with irrigators, separate to achieving Basin Plan goals. Well directed investment in irrigation programs will produce a broader social benefit in the areas of: increasing food production, export income and flow on jobs for the community; and helping to drive regional development.

Irrigation productivity example:

Bundaberg is famous for its sugar cane (and the products that come from it). In that region:

- A dry land cane farm can produce around 40-45 tonnes per hectare.
- An Irrigated Cane farm produces 90 to 100 tonnes per hectare.

Nearly doubling that tonnage per hectare flows on to nearly double the workforce at the processing mills with two mills operating instead of one – direct additional employment of around 400 people just in the mill.

{Source – Dale Holliss, Bundaberg Regional Irrigators Group}

NIC sees an ongoing need, beyond the Basin Plan, for Government to continue to be involved with industry in investment. We acknowledge current programs in this area including the great work under public/private investment, as part of the effort to grow Tasmania's irrigation areas along with investment in Northern Australia. Future programs should consider capital funding for new infrastructure along with investment in existing irrigation districts on and off farm.

***Recommendation 9:** that the Government recognise the ongoing role for national programs (separate to programs designed to achieve Murray Darling Basin objectives) to fund new irrigation infrastructure and on and off farm efficiency programs in existing irrigation areas. The efficiency aspects of these programs could involve part funding of projects with 100% of water saved, able to be retained for increased agricultural production.*

Supporting agriculture production, industry and jobs through accessible and affordable energy

While this inquiry is not designed to examine the impediments to a productive irrigated agriculture sector due to high energy costs, it is important to understand that productivity gains have been largely overshadowed by the high cost of electricity faced by the sector, putting upward pressure on prices and downward pressure on Australia's international competitiveness. This is undermining Australia's capacity to be a competitive global food producer and to put fresh food on the tables of Australians households.

Rural industries impacted by the high cost of electricity play a key role as economic drivers in local economies and nationally. They include the cotton, rice, sugar, wine, almond, horticultural and dairy industries, all major producers of Australian agricultural product much of which is exported. These industries provide employment and flow on benefits for regional communities and the nation. Across these commodities, energy is used in a variety of ways such as pumping irrigation water, pasteurisation, cool rooms, processing plants and moving products.

It is also important to appreciate the link between the efforts of the irrigated agriculture sector to improve productive output with less water while at the same time being undermined by the high cost of electricity. Reform of Australia's water resources sector in recent years has resulted in greater competition for those resources. While water savings have been achieved on-farm through investment in infrastructure, the resulting higher use of energy has coincided with a dramatic increase in the cost of electricity.

Analyses show that irrigators and growers' electricity bills have increased in excess of 100% in most cases, and up to 300% for some over the period 2009-2014, largely due to the rising cost of network charges imposed by the network companies.

Typically, government regulated network charges and other costs represent around 50% to 56% of farmers' electricity bills; the actual electricity charges account for around 26%, although this is also changing rapidly. Network charges imposed by the electricity networks continue to have a highly distorting effect on the electricity market. Australian consumers are paying around twice as much for network charges as those in the United Kingdom and around 2.5 times as much as those in the United States.

Irrigated agriculture users of electricity are forced to operate in a market environment which lacks genuine competition and appears dominated by maximising returns to generators and infrastructure owners. It is unacceptable that consumers are forced onto the spot market due to an inability to secure quotes from retailers for fixed term contracts. The absence of competition results in gaming on the spot market which is struggling to cope with the transition to renewables. The recently announced Australian Competition and Consumer Commission (ACCC) review of retail electricity prices is welcomed.

As noted, the sector is amongst the most efficient in the world, providing tangible benefits to all Australians. Research and development supports innovation in the agriculture sector and has the capacity to leverage investment made in irrigated agriculture industries.

NIC has long advocated for reform of Australia's National Electricity Market (NEM). Australia's weak energy policy framework and unsustainable energy costs are undermining the viability of businesses and industries which produce food and fibre for domestic and export markets. The recommendation below is consistent with our recommendation to the current Finkel Review and we refer the Committee to our submission. NIC will also provide a submission to the House of Representatives inquiry into modernising Australia's electricity grid.

A cultural shift is needed away from the entrenched relationship between the regulators and the networks, with greater opportunity for businesses and consumers to fully participate in appeals and review processes in relation to the Australian Energy Regulator (AER) five-yearly pricing determinations processes. A comprehensive assessment of the economy-wide costs and benefits of revising the regulated asset bases (RABs) of electricity network and transmission businesses regulated to efficient levels is also long overdue.

Australian consumers are paying around twice as much for network charges as those in the United Kingdom and around 2.5 times as much as those in the United States.

The closure of coal fired power is causing significant impacts on the energy market, with gas increasingly on the agenda as a transition fuel to a lower carbon economy. Yet at the same time moratoriums in Victoria, New South Wales and the Northern Territory on unconventional gas exploration and ongoing expansion of LNG export are further undermining Australia's energy security.

Improved planning and coordination between the Commonwealth and the states in this space is critical to ensure energy affordability and reliability as the generation mix continues to change into the future.

Recommendation 10: *To address the impact of high energy costs on viability of agriculture, NIC recommends:*

- *A 30% reduction in the regulated electricity prices based on the 2014-15 financial year*
- *A medium to long term price averaging 8 cents per kilowatt-hour for the electrons and 8 cents per kilowatt-hour for the network.*

- *A rule change via the Australian Energy Market Commission (AEMC) to change the way electricity networks' regulated asset base (RAB) is calculated.*
- *A national food and fibre tariff model.*
- *A water energy productivity program designed to fund and accelerate the adoption of energy solutions (provided at Attachment A)*
- *Fundamental reform of the National Electricity Market (NEM) to address the lack of genuine competition, the operation of the bidding process and a market where consumers' interests are fairly represented.*
- *Stability and certainty in national energy policy to allow investment.*

Supporting agricultural competitiveness through red tape reduction

Agricultural industries across a range of sectors over time have faced increased regulation. Since the introduction of the Water Act 2007 irrigated agriculture has seen a dramatic increase in regulation as well as more complex governance arrangements where now both state and federal governments have assumed overlapping responsibilities in the management of our water resources. This results in significant duplication which impacts on the profitability and financial viability of the businesses and the government agencies involved in the sector.

With the massive growth of water regulations and reporting obligations, combined with the cumbersome nature of requirements with the involvement of state and commonwealth agencies, it is time to undertake a legislative and regulation mapping exercise across governments to identify all regulations, which agencies and which governments are involved and for what purpose.

As noted earlier in this submission, governance arrangements remain cumbersome with the involvement of numerous agencies in the operations of the Basin Plan, representing additional complication and cost burden for communities and industries.

Recommendation 11: *The Committee supports the Government's continued commitment to reduce red tape for the agriculture sector.*

Water Act 2007 review: recommendations for red tape reduction

A series of recommendations provided by the Expert Panel to the Government as part of the 2014 review of the Water Act 2007, related to the burden of regulation on the irrigated agriculture sector and irrigation businesses.

Under Recommendation 11, the ACCC undertook a review of Water Charge Rules, in consultation with industry and Basin State governments with the aim of reducing the cost to industry and governments.

The ACCC draft advice provided to government in late 2015 incorporated a series of additional measures without justification or substantiation. NIC submitted views to the ACCC on the draft advice, and again on the ACCC Final Advice, released in November 2016. Some improvements in terms of red tape reduction were reflected in the Final Advice. A major improvement has been the removal of Part 5 relating to Network Service Plans (NSPs), strongly advocated by NIC. However, the remainder ACCC Final Advice represents different impacts for irrigation infrastructure operators, and it continues to be a concern that the Final Advice as it currently stands, relates to new levels of risk and uncertainty for IIOs.

Under Recommendation 18 relating to the provision of water information, an interagency Working Group was established led by the Bureau of Meteorology to report to the Government on:

- (a) current water information reporting requirements under the Act and associated regulatory burdens for data providers, including an estimate of current costs
- (b) the benefits of the suite of information products with reference to associated costs borne by data providers
- (c) options to reduce the regulatory burden imposed on data providers in the order of 20 per cent or more compared to current regulatory burdens.

The Working Group provided its report to Government in early 2016 with a series of recommendations and actions designed to reduce the reporting burden for irrigation infrastructure operators (IIOs). The Government agreed to all recommendations in the report.

NIC continues to monitor the implementation of these measures to ensure the provision of water information continues to be streamlined.

Murray Darling Basin

Environmental flows and complementary measures

Basin Ministers at the recent March 2017 meeting, reiterated their earlier request for officials to consider opportunities for a wider range of complementary projects, such as carp control, to provide triple bottom line benefits under the Basin Plan. NIC has long advocated for greater effort be directed to the development of a suite of non-flow measures, and as also proposed by the Northern Basin Advisory Committee (NBAC). These include:

- carp control through the release of the Carp Herpes virus
- appropriate management of cold water pollution
- improvement of fish migration through fish-ways
- restoration of native fish habitat o feral animal and weed control in wetlands and riparian areas
- increased ability for Commonwealth Environmental Water Holder (CEWH) to trade water.

The implementation of non-flow approaches to achieve environmental outcomes (rather than the recovery of more water entitlement) and proper measurement of long term environmental outcomes, is critical to the sustainability of communities throughout the Murray Darling Basin. This will optimise every opportunity to deliver real environmental outcomes.

It is pleasing to note that the recent meeting of Commonwealth and state Basin Water Ministers again *'agreed that complementary environmental projects can provide real environmental benefits and agreed to seek options to better embed complementary measures as a key element of achieving Basin Plan outcomes.....and that work will continue to develop a method for assessing these benefits.*

Recommendation 12: *The Committee support the agreement of Basin Water Ministers to continued development of a method for assessing the benefits of embedding complementary measures as a key element of achieving Basin Plan outcomes.*

Monitoring and evaluation of environmental water

The Basin Plan places a number of obligations on monitoring, evaluation and reporting on the use of Commonwealth environmental water. The Water Act requires an annual report on the management of environmental water be provided to the relevant Commonwealth and Basin State Water Ministers.

The report must include information on achievements against the objectives of the Basin Plan's Environmental Watering Plan. We contend however, that the Environmental Watering Plan is not a plan, but rather a loose framework that provides little information for communities to understand the long term and seasonal objectives.

To be managed well, water must be properly monitored. Specifically, NIC seeks to better understand the key objectives to be achieved through environmental watering, for example:

- Against what baselines will objectives be measured?
- How will objectives be reported?
- How will they guide future decision making?
- How will local stakeholders be engaged?

Environmental water holders (state and Commonwealth) must work with local stakeholders to outline the specific objectives they seek to achieve out of their environmental water portfolio for each valley in which water is held, with a focus on the 'localism' approach. Objectives must be based on clearly defined ecological and hydrological baselines. Baselines must be evidence based and publicly available.

It is important that jurisdictions work together to achieve Basin-wide outcomes. This is particularly so during the development of the Basin states' Long Term Environmental Water Strategies under the Basin Plan. Through this process, it should be made clear to stakeholders how the state strategies feed into the wider strategy.

Monitoring and evaluation objectives must:

- be fit for purpose and recognise that a flow based solution has some limitations in achieving good environmental outcomes
- be specific enough to be measurable; and
- include indicators that demonstrate improvements over time rather than reporting conditions only at specific points in time.
 - For example The 'River Murray and fringing wetlands' is too broad to effectively monitor outcomes. The MDBA identified 18 hydrologic indicator sites that would provide a more localised but representative monitoring area.
- Environmental watering must be measurable:
 - Site specific watering at locations such as Hattah Lakes or through the Koondrook Perricoota cutting must be metered in the same way as consumptive diversions are metered.
 - Assumptions for water use in over-bank flows must be explained
- Environmental water holders must report publicly against the objectives including:
 - Where objectives have been met and where they are not met and why;
 - Where watering occurred in isolation or in association with natural events or where outcomes were achieved only through natural events.
- All monitoring programs under the different jurisdictions must be cooperative and consistent.
 - Outcomes from one program must inform other programs
 - State and federal agencies must share knowledge and avoid duplication
- All reporting of environmental water should be viewed in the context of social, economic and environmental outcomes.
- Legacy costs must be properly determined o Environmental programs for the 'public good', including monitoring programs, should be funded by the 'public purse'.

NIC seeks Commonwealth and state environmental water holders to outline the specific objectives and desired achievements from their environmental water portfolio for each valley in which water is held and how they intend to work together to achieve objectives and avoid duplication. To ensure the 'localism' model is implemented, local stakeholders must be involved in the identification of these objectives.

NIC has previously advocated for the streamlining of environmental water delivery governance arrangements. The Water Act 2007 has not satisfactorily addressed the issue identified by former Prime Minister, John Howard who observed in 2007 in 'A National Plan for Water Security':

'Widely distributed responsibilities for the management of the Basin have led to inefficiency, blame-shifting and under-resourcing by state and territory governments'.

Governance arrangements remain cumbersome with the involvement of numerous agencies in the operations of the Basin Plan. This represents additional complication for communities and industries, and also goes to the planning and management of environmental water. For example, institutional arrangements for the management of water in New South Wales across the federal and state governments, involve nine different government agencies. These include:

- Department of Environment and Energy (Commonwealth)
- Commonwealth Environmental Water Office (Commonwealth)
- Murray Darling Basin Authority (Commonwealth)
- Department of Agriculture and Water Resources (Commonwealth)
- Office of Environment and Heritage (State)
- Water NSW (State)
- Department of Primary Industry – Agriculture (State)
- Local Land Services (State)
- Department of Primary Industry – Fisheries (State)

This model is flawed, it is cumbersome, creates confusion and adds additional levels of red tape, contrary to the aims of the Basin Plan.

About the National Irrigators' Council

The National Irrigators' Council (NIC) is the national peak body representing irrigators in Australia. The Council supports twenty-nine (29) member organisations covering the Murray Darling Basin states, irrigation regions and the major agricultural commodity groups. Council members collectively hold approximately 7,000,000 mega litres of water entitlements.

The national body is the policy and political voice of those who use water for commercial agricultural purposes, producing food and fibre for local consumption as well as making a significant contribution to Australia's export income.

NIC is funded by irrigators, for the benefit of irrigated agriculture which provides jobs in rural and regional communities. Members are not individual irrigators but members of their respective representative organisations. An irrigator is defined as *'a person or body with irrigation entitlement for commercial agricultural production'*.

Member organisations are located in irrigation regions across Australia within the Murray-Darling Basin and beyond. They represent a diversity of organisations from irrigation infrastructure operators, individual irrigators, processors through to agricultural commodity groups who produce and value add food and fibre for domestic consumption and significant export income.

NIC advocates on behalf of irrigated agriculture and aims to develop projects and policies to ensure the efficiency, viability and sustainability of Australian irrigated agriculture and the security and reliability of water entitlements. The NIC advocates to governments, statutory authorities and other relevant organisations for their adoption.

NIC aims to develop policy and projects to ensure the efficiency, viability and sustainability of Australian irrigated agriculture and the security and reliability of water entitlements.

NIC Guiding Principles

The National Irrigators' Council (NIC) objectives are to:

To protect or enhance water as a property right and to champion a vibrant sustainable irrigation industry.

NIC is the voice of irrigators and believes in the following principles to guide future policy decisions:

- A healthy environment is paramount
 - Sustainable communities and industries depend on it
- Protect or enhance water property rights.
 - Characteristics of water entitlements should not be altered by ownership
- No negative third party impacts on reliability or availability
 - Potential negative impacts must be compensated or mitigated through negotiation with affected parties.
- Irrigators must be fully and effectively engaged in the development of relevant policy.
- Irrigators expect an efficient, open, fair and transparent water market.
- Irrigators require a consistent national approach to water management subject to relevant geographical and hydrological characteristics.
- Irrigators expect Government policy to deliver triple bottom line outcomes.
- Regulatory and cost burdens of reform must be minimised and apportioned equitably.

Attachment A: National Irrigation energy productivity program

The Agriculture Industries Electricity Taskforce¹⁵ (the Taskforce) on behalf of its member bodies seeks support for a \$250 million program to deliver major energy savings in the Australian irrigation sector.

The program will comprise a fund for on-ground energy productivity works, administered by ARENA (Australian Renewable Energy Agency) supported by an integrated R&D, demonstration and extension program¹⁶ led by National Irrigators' Council (NIC) and delivered in partnership with Taskforce members.

Eligible technologies will include solar generation and battery storage (where applicable), the suite of digital and engineering technologies required to optimise energy efficiency and demand management on farm and smart grid connection solutions.

The program offers significant benefit to farmers, authorities responsible for bulk water allocation and electricity distributors who have to manage difficult peak loads in summer.

The connection between irrigation water use efficiency and energy consumption is well documented – pressurised, water-efficient systems demand more energy and are therefore more costly to operate. The high cost of energy, particularly electricity, is driving irrigators to move away from water efficient systems and has established a perverse arbitrage between water cost and energy cost.

A collaborative program to address this problem is a matter of highest national significance and is central to achieving government's target of doubling agricultural productivity.

Program outline

The program will comprise a \$230 million fund for capital works projects, administered by ARENA, supported by a \$20 million capacity building program led by NIC and delivered in partnership with Taskforce members. The Taskforce will provide an efficient pipeline between farmers and ARENA, reducing transactional costs and facilitating project aggregation.

Taskforce members have the capability to deliver the program against the background of their experience as delivery partners in government programs such as Energy Efficiency Information Grant Programs, on-farm water recovery projects under the Murray Darling Basin Plan and the Reef Rescue initiative.

The capacity building program will comprise:

- **Technical and business case support** to farmers and irrigation districts in building proposals to the ARENA fund.

¹⁵ Electricity Taskforce: National Irrigators' Council; NSW Farmers Association; National Farmers' Federation; Cotton Australia; NSW Irrigators' Council; CANEGROWERS; Queensland Farmers Federation, Central Irrigation Trust (SA), Bundaberg Regional Irrigators Group (BRIG)

¹⁶ The water energy nexus is well documented globally. Optimal water efficiency in irrigation can only be achieved by piping irrigation networks and pressurizing delivery, ideally regulated using smart, automated control systems. Operating such systems, however entails far higher energy usage than flood and other gravity based systems.

- **R&D pilots.** A strategically selected suite of innovation pilots across Australia representing the range of irrigation farming systems, water delivery scenarios and energy sources (ie diesel, electricity, renewable, hybrid). Technical issues covered will include layout, pumping optimisation, automated control systems and sensor tech, energy source and timing (eg load shifting) and potential for substitution of energy source, including renewable options.
- **Multi-channel extension from a trusted industry source**
 - Field days on pilot properties
 - Farm sector networks (branch meetings, events)
 - Seminars and webinars
 - Case studies from the pilot properties
 - Fact sheets covering the resulting key engineering and energy solutions
 - Digital engagement campaigns telling the water/energy innovation story using farm sector channels (AgInnovators and the Farmers Australia portal)
 - A community-of-practice digital hub for technical resources (using or linked with the RIRDC/eXtension AUS platform, and/or the federal EEX energy extension hub). This will bring together the programs extension collateral along with existing technical resources across peak innovation and service provider bodies.
 - Professional training. Development of curriculum and provision of technical training for irrigation engineers, energy engineers and agronomists. A scoping study conducted by NSW Farmers in 2014 identified a significant skill gap in the space between electricity services, irrigation engineering services and agronomic services. All three disciplines need training to support a multidisciplinary approach to optimising irrigation systems for water and energy efficiency and yield.

Partners and collaborators

The program will be led by NIC and delivered in partnership with its member bodies in collaboration with relevant state and regional bodies.

The National Alliance to Save Energy supports the proposal and has recognised it as a priority initiative under its 2xEP campaign.

Leveraging previous grant programs

The program will build on previous government initiatives in the farm sector including those delivered by NSW Farmers and Dairy Australia under the Federal Energy Efficiency Information Grant Program, and projects delivered by Cotton Australia and other RDCs working in the irrigation space.

The current proposal has emerged directly from our collective experience working with farmers on energy innovation under these programs.