



SUBMISSION: OUR CLIMATE – YOUR SAY CONSULTATION

Date: 18/07/2018
Name of Submitter: Irrigation New Zealand Incorporated
Postal Address: Lincoln Research Centre,
PO Box 69119,
Lincoln,
CHRISTCHURCH 7640
Telephone: 03 341 2225
Mobile: 027 4966 314
E-mail: acurtis@irrigationnz.co.nz

A handwritten signature in black ink, appearing to read "Andrew Curtis", written over a horizontal line.

(Andrew Curtis, CEO Irrigation NZ)

ABOUT INZ

1. INZ represents over 3,500 irrigator members nationally, including irrigation schemes and individual irrigators. Our members include a wide range of farmers and growers – dairy, sheep and beef and cropping farmers, horticulturalists and winegrowers.
2. INZ also represents over 120 irrigation service industries – manufacturers, distributors, irrigation design and install companies, and irrigation decision support services.
3. As an organisation we actively promote best practice irrigation and carry out a range of training and education activities. Over the last 5 years we have trained over 3,000 irrigators and service industry staff on different aspects of irrigation best practice to improve water use efficiency.
4. INZ members share the same goals as all New Zealanders:
 - to see improvements to our environment
 - to make a contribution to their communities
 - to make a living for themselves and their families.
5. We thank the government for the opportunity to make a submission. We have focused our submission on issues related to water and irrigation and would be happy to have further discussion on any of the matters covered.

SUBMISSION SUMMARY

- Support the establishment of a Climate Commission to advise government in target setting and hold government to account if it deviates from technical advice
- Support the development of a National Climate Change Adaptation Plan providing there is a greater emphasis placed on mitigation strategies and the better targeting of public investment
- Support the establishment of a Green Investment Fund to stimulate investment in low carbon industries
- Government climate change and water policy are inextricably linked. The Climate Commission needs to be integrated with current or any future entities responsible for water policy development and implementation.
- Government needs to urgently formulate its policy for the continued modernisation and development of water storage and distribution infrastructure. A reliable water supply is essential if the proposed land use change to horticulture and arable production proposed to reduce emissions are to become a reality.

SUBMISSION

Climate Change Commission

6. We support the establishment of a Climate Change Commission.
7. We think that setting a general statement of intent in the Bill, followed by the establishment of a Climate Change Commission to advise the government around a specific target is a sensible approach, particularly given the current uncertainty around the transition costs.
8. Providing the Climate Change Commission is technical in nature we think it should also have the power to hold the government to account. By this we mean the ability to publicly question the government if its policy decision making deviates from the technical advice provided.

National Climate Change Adaptation Plan

9. We support the development of a National Climate Change Adaptation Plan.
10. However, we find the plan to be very risk focused in nature. Whilst we understand the risks of climate change are extremely important to understand, we also think the adaptation plan needs to place an equal emphasis upon mitigation strategies, including the better targeting of future public investment. Investing in mitigation has the potential to be very cost effective when compared with the cost of doing nothing and letting climate effects damage our economy, homes, infrastructure and agricultural productivity (given the associated insurance costs, loss of tax and private income and repair costs).

The development of more horticulture and arable land will require irrigation expansion

11. We note that the emission modelling scenarios included in the accompanying reports to the consultation document forecast a significant growth in horticultural land area in New Zealand. The scenarios depict 500,000 or 1 million hectares of new horticulture and arable land being developed, alongside some decline in sheep and beef farming and possibly dairy farming.
12. Whilst we think there is much scope for horticulture and arable expansion, we consider the 1 million hectares scenario to be unrealistic. According to current land use data there is approximately 130,000 hectares of horticulture and 220,000 hectares of arable production in NZ. There would therefore need to be a three-fold increase in this area by 2050 for the 1 million hectares scenario to hold true.
13. Regardless, to achieve a significant expansion in horticulture and arable production as lower emission land uses, access to a reliable irrigation will be essential. Currently over two thirds of high value horticulture and viticulture land is irrigated. Irrigation will become ever more important in the future as even higher rainfall areas are forecast to experience increasingly frequent and severe droughts as a result of climate change.
14. While some existing irrigated land may be able to be converted to horticulture and arable use, to achieve the amount of expansion being considered, significant additional water storage (either above or below ground) and distribution infrastructure would need to be developed to deliver the water supply reliability required.
15. Whilst horticulture and arable typically uses less water per hectare than pastoral irrigation, they require an extremely reliable water supply (greater than 95%). Much of the irrigated land in NZ currently has poor irrigation reliability (less than 80%) and thus is not suitable for horticulture and arable production. Alongside the creation of new water storage and distribution infrastructure developments, perhaps the biggest opportunity exists through continued support to modernise existing irrigation infrastructure to become more water and energy efficient, whilst providing additional storage capacity to allow for increased reliability and an expanded irrigated area.
16. The government will therefore need to formulate clear policy around water abstraction, storage and its use for irrigation if it is to base its future climate change policy around the proposed land use scenarios.
17. An example of the opportunity to modernise existing schemes to provide additional irrigation capacity is Amuri Irrigation Company. The Company recently replaced its open water race network with a piped network, resulting in 30% of water previously lost through leakage becoming available. This has allowed the irrigated land area to be expanded to add an additional 6,000 hectares while still using the same overall amount of water. At the same time this project was being completed, irrigators have worked to improve the health of the Pahau River, where E.Coli, phosphorus and nitrogen levels in the river have all been decreasing which resulted in the river being named Most Improved River at the New Zealand River Awards in 2017.

18. There are also other significant issues to be addressed for increased horticulture and arable production to occur - such as labour availability and access to international markets, both of which will need to be addressed in part through government policy.

Establishment of a Land and Water Commission

19. As recommended by the Land and Water Forum, we also support the establishment of a Land and Water Commission. Government policy towards water and water infrastructure is one of the core components of a wider climate change strategy. In-order to achieve the emission reductions sought and transition to new activities (for example shifting from cattle farming to horticulture and arable farming), water users and water infrastructure providers need long-term certainty about government policy in this area.
20. We applaud the bipartisan approach taken by political parties towards Climate Change policy. We would therefore encourage all parties to take a similar approach to water and land management where decisions are made based on science and technical advice and agreed long-term objectives which meet social, economic, cultural and environmental requirements. The Land and Water Commission must have specialist expertise to develop policy in this area.
21. Close liaison would be needed between the proposed Climate Change Commission and the Land and Water Commission (if one were to be established). Both Commissions would need to develop a consistent approach to water management and the recognise the significant impacts climate change will have on water, including more frequent and severe flooding, heavier rainfall, changes in rainfall patterns and more frequent droughts. Assessments and mitigation strategies need to consider impacts on agricultural production, local council infrastructure and other affected sectors, as well as economic, environmental and social wellbeing.

Green Investment Fund

22. We support the establishment of a Green Investment Fund.
23. Irrigation consumes a significant proportion of national electricity consumption. From past studies (Barber 2005¹ and INZ 2014²), IrrigationNZ estimates national irrigation energy use to be at least 1,000 GWh per annum. This is equivalent to around 2.5% of NZ's energy generation. For example, the 2014 study found an average energy use of 1,600 kWh per hectare. When this was extrapolated out to the irrigated area now under spray irrigation this equated to just over 1,000 GWh per annum. It should be noted this is likely a conservative estimate as the 2014 study was undertaken in a season with below average irrigation demand – a wet start followed by lower temperatures than normal.

¹ *Energy Use and Efficiency Measures For the New Zealand Arable and Outdoor Vegetable Industry*, Barber 2005

² *'Irrigation Energy Efficiency Evaluation Pilot Project' Summary report*. IrrigationNZ, May 2014

24. There are already energy saving innovations occurring in the irrigation sector. For example, in 2012 the Valetta Irrigation Scheme replaced its open race system with a closed gravity-fed piped system to provide water under pressure to irrigators. This resulted in significant savings in pumping costs alongside electricity generation where water pressure permitted.
25. In general the areas where the most power savings can be made include replacing older pumps and motors with modern, more efficient ones, more accurately specifying pump and motor requirements alongside installing new technology such as solar pumps. Southern Water Engineering in Blenheim is also an example of a company which carries out irrigation energy and water use efficiency audits to identify opportunities to make power and water savings. While energy efficiency improvements are starting to occur there is significant scope for further innovation and wider adoption of energy saving technology in the irrigation sector.
26. The findings of the pilot INZ energy efficiency project in 2014 confirmed there is considerable scope to improve energy use efficiency of irrigation systems. Evaluations showed a wide range of performance and current performance was often sub-optimal. Of the 14 systems evaluated 12 had improvements to make. Savings identified ranged between 2 - 32% depending on the actions, with 10 - 20% being typical.
27. Based on this information and previous studies³, INZ conservatively estimate irrigation energy savings across the industry could see a 10 - 20% improvement in energy efficiency. This would create significant energy savings for NZ of between 110 - 220 GWh per annum.
28. Savings can be made in two areas:
 - system design (reducing pressure and optimising the efficiency of the components – affecting peak energy loading and total energy use)
 - system operation (a reduction in water use – total energy use).

The pilot study showed savings in both areas for most properties, however in some instances the design was limiting the ability of operation to improve. Hence improving the design would mean operation could also be improved.

29. Irrigation demand is at its highest during the peak summer months and in some areas (notably Canterbury) this has created a new peak load for rural electricity lines infrastructure in what was traditionally the low load period. Corresponding with this is the fact that in drought years when El Nino conditions prevail our hydro lakes can have lower than normal inflows putting further pressure on our generation and storage capacity. Improving irrigation energy use efficiency will therefore help alleviate both of these issues.
30. Training irrigators to optimise irrigation use can also result in significant water and energy efficiency savings through improving their understanding of when irrigation should be applied and how to use technology such as soil moisture monitoring. IrrigationNZ is working on making training more accessible through launching an online training system for our members, as well as continuing to offer in person irrigation training options.

³ Aqualinc 2009; Lincoln Environmental 2003

SUBMISSION ENDS