National Irrigators' Council

Energy Security Board
Post 2025 market design
Options Paper

Removing barriers to Australia's agricultural competitiveness

Contents

The National Irrigators' Council (NIC) is the national peak body representing irrigators in Australia. The Council supports thirty three (33) member organisations covering the Murray Darling Basin states, irrigation regions and the major agricultural commodity groups. Council members collectively hold approximately 5,500,000 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 (GVIAP) in 2017-18 increased to $17.7 billion (up 14%) {Australian Bureau of Statistics}

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.

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Overview

National Irrigators' Council (NIC) thanks the Energy Security Board (ESB) for the opportunity to comment on the Post 2025 Market Design Options paper.

This submission will broadly focus again on the issues highlighted in NIC previous submission in October 2020 in response to the ESB examination of a post-2025 energy market.

Without the level of knowledge to provide specific input on the technical issues raised in the Options paper, our comments will broadly focus on issues that NIC views as remaining to be resolved during this period of energy market transition, issues like reliability and affordability so that the agriculture sector has the capacity to produce food and fibre with fair costs that enable the sector to remain competitive and agriculture businesses to thrive.

We note the Options paper focuses on the reform pathways that fall into three categories:

1. Immediate reforms to be done now: relating to the orderly exit of thermal plants as they retire from the system – including possible changes to notice of closure requirements, improved information to market participants and policy makers and the potential for arrangements with thermal plants and other matters, including investigating, with governments and industry, a potential NEM-wide approach to integrating jurisdictional underwriting or investment schemes for new investment into the NEM.
2. Initial reforms to be developed and implemented in the near term where the ESB is exploring options for modifications to the retailer reliability obligation to ensure that retailers have an incentive to maintain a portfolio of contracts with new and existing resources, including storage and dispatchable resources, adequate to cover their customers' needs. Consideration is being given to changes to the 'trigger' (including no trigger at all) and other related matters including contracts meeting retail obligations and customer needs. Against the background of uncertain investment environment, other matters being considered include the investment signals necessary to drive both contracting for dispatchable resources and efficient decisions around the closure of ageing large scale generation.
3. Longer term reforms which depend on development in the industry, including technical changes. This reflects the continued growth of renewable generation and the need for despatchable capacity and various types of storage, with the aim to deliver reliable investment and low overall costs to consumers. The right mix of resources will be necessary, on the demand and supply side, to be brought into the energy market while maintaining reliability and ensuring consumer costs are minimised. The mix of technology will include new and emerging technologies which may require refinements to market arrangements.

NIC has consistently highlighted the negative impact on the Australian agriculture sector's capacity to produce food and fibre against the backdrop of high energy costs. And disappointingly, as part of our engagement over many years with energy policy and regulatory entities, it is evident that there is a significant gap in the understanding of these impacts on productive agriculture and rural industries to maintain viability and to remain competitive.

Energy use across the agriculture sector is variable, dependent upon the industry and the intensification of operations at various times. Energy is used for pumping irrigation water, pasteurisation, cool rooms, processing plants and moving product. Operations that require heating, cooling or irrigation have higher levels of electricity use. Some industries have stable electricity consumption year-round, while in others there is seasonal variability.

A national coordinated energy policy will assist in enabling agriculture industries to operate in a competitive environment within an affordable pricing regime, while supporting the uptake of renewable energy without unintended energy price distortions. Australia has moved from a country which once enjoyed a competitive advantage in energy costs, to being one where energy is now a competitive disadvantage.

The rapid changes across Australia's energy system present opportunities for the productive agriculture sector to be part of these changes. These opportunities exist for example, in stand-alone systems and micro grids, the Government's Technology Investment Roadmap, ARENA's Bioenergy Roadmap and as policy and planning matures, renewable energy zones.

The growth of variable renewable energy into the system also poses challenges around system security and grid design, ensuring enough supply when solar and wind are not generating. This occurs when services such as frequency, voltage control and inertia are typically provided by baseload coal power stations. As a result, the closure of coal fired power generation combined with the increased proportion of renewables into the system, is causing system challenges.

NIC recommends:

- Recognition of the particular needs of the agriculture sector and regional communities in all elements of market and grid design, including structure and costs to facilitate rural consumers and the agricultural sector in taking up new technology and being connected to the grid, rather than presenting a barrier, through the following measures:
    - Technologies that can be rolled out on a scale which will make their use viable on farms and in agricultural processing.
    - Network cost and regulation that does not impede the take up of new technologies e.g. making grid connection and microgrids practical and affordable.
    - Australia's productive rural industries at the forefront in planning, including financing for demonstration projects and extension services to promote take-up.
- An overarching national energy and emissions policy that provides policy certainty for investors, which includes rules around carbon farming.
- Caution against the imposition of exaggerated costs associated with unwarranted and unnecessary regulation in market design development to avoid 'gold plating'.
    - Proposed regulatory and/or policy changes should include a cost benefit.
- The post-2025 market design include a requirement that policy and/or regulatory proposals put forward by energy regulator and infrastructure owners, provide a 2-3 page 'regional and rural implications statement', which details the likely impact of the proposal or reform, drawing stakeholder attention to issues that would have regional and rural impacts.
- A design which supports the Ag Energy Taskforce's price objective of a medium to long term price capped at 8 cents per kilowatt-hour for the electrons (R) and a similar ceiling of 8 cents per kilowatt-hour for the network (N).
- A rule change via the Australian Energy Market Commission (AEMC) to enable the AER to optimise an electricity network's regulated asset base (RAB) similar to the pre-2006 NEM rules that required the regulator to optimise the transmission and distribution network regulated asset base/s.
- Recognition in AER calculations that Rate of Return for network owners should be based on low risk and low cost of finance models as opposed to the current Rate of Return which is generating super normal or 'monopoly' profits.
- A suite of national food and fibre tariff model/s.
- The agriculture sector included in the cohort of large commercial and industrial consumers (C&I), recognising the sector's contribution to Australia's food and fibre production and is rightly seeking to be competitive, and to provide jobs and export opportunities.
- Fundamental reform of the National Electricity Market (NEM) to address the lack of genuine competition, the operation of the contract bidding process and a market where consumers' interests are fairly represented.
- Stability and certainty in national energy policy to allow investment.

Recognising the needs of Australia's productive agriculture sector

It is worth again highlighting the needs of Australia's agricultural industries which have production processes that rely heavily on power. Electricity is used for the operation of pumps for irrigation, refrigeration for storage of food and fibre products, and processing and packaging industries.

Agriculture has been hard hit by energy costs where irrigators, for example, have seen their competitiveness and ability to achieve a profit diminish rapidly as the price of pumping water for those on the grid has escalated. Similarly, agricultural activities involving processing, packaging and cool storage have been severely impacted by high energy prices.

Australia transitioned from having the fourth cheapest electricity cost in the OECD in 2004 to being the fourth highest in 2018 (ACCC, 2018, p. 23). This is impacting on Australia's ability to compete globally, with impact on industry and significant job losses.

These issues are very real for a sector that has the objective of boosting its contribution to the Australian economy from the current $60 billion per annum to $100 billion in less than a decade.

Some producers have been forced off the grid or out of business. Export competitiveness has been undermined, and as price takers Australian farmers are seeing real impacts on their viability. This is despite the agricultural sector having a bigger take up of solar power projects than any other sector.

A paper titled *Maximising Consumer Outcomes from Retail Electricity Markets* [1] in 2019 noted the opportunity for regional and rural Australia to determine whether they are best served by a centralised one-size fits-all approach to electricity rules and regulations, as provided by the NEM.

The paper suggested that rural and regional communities benefit the least from the current market structure, and that the regulatory and institutional frameworks that govern the NEM are not primarily focussed on maximising outcomes for these consumers, and recommended:

- consideration of the costs and benefits of separate market arrangements for regional and rural areas, including the potential for a vertically integrated electricity system for rural and regional communities; and,
- that any vulnerability/hardship strategy acknowledge the increased vulnerability of regional and rural communities to changes in the affordability or reliability of electricity, and have specific initiatives to address this vulnerability.

Australian farmers are the potential early adopters of appropriately scaled technology emerging from policy initiatives and developments like the Technology Investment Roadmap process. The agriculture sector's role in any national policy framework and the technology roadmap is important because the sector can be an adopter of energy technologies for on-farm use. This is both in generating energy and reducing demand; as potential exporters of energy and feed stocks; and in sequestration through land management.

Australia should have a comparative advantage for those producers – offering reasonably priced power from the grid. The high cost of electricity generated power has resulted in some agriculture industries moving to and/or exploring off grid solutions. These are in some cases diesel and diesel/solar hybrid solutions. Industries are also taking up opportunities offered through the Australian Renewable Energy Agency (ARENA), for example, to power irrigation pumping systems using solar photovoltaic (PV) energy and other approaches such as renewable bioenergy running on biogas from waste streams associated with intensive livestock industries.

[1] *Maximising Consumer Outcomes from Retail Electricity Markets, prepared by Ash Salardini for the 2019 Energy Consumers Australia Gill Owen Scholarship.*

Many industries however are not in a position to move to off grid solutions and for these industries, the most significant impact of the high cost of electricity is producers finding themselves unviable and in the case of irrigated agriculture, deciding to move out of a particular irrigated crop. This impacts the ability for the crop to grow in a timely manner for harvest and to a quality and quantity being achieved that enables a return on the investment.[2]

It would be a perverse outcome for irrigators, who have legally invested in infrastructure (which is enabling the efficient use, application and storage of irrigation water), as a result of high energy prices to be forced to use that infrastructure less, or at worst, that infrastructure becomes redundant.

Some are choosing to convert their farms from intensive irrigated agriculture to lower value dry land agriculture and sell valuable water to maintain their short term viability.

We would like to see the productive agriculture sector recognised along with references to large commercial and industrial consumers (C&I). This would reflect that the sector is as equally important as Australia's large manufacturing industries, and who are producing food and fibre and are rightly seeking to be competitive, and to provide jobs and export opportunities

NIC's recommendation is that the post-2025 market design should include a specific rural and regional impact statement along with market design consideration of the needs of rural industries, agriculture and the needs of rural and remote consumers.

Energy transformation is enabling both physical technologies for the generation, storage and use of power; and 'soft' technologies that can monitor, manage and secure trade power. The availability of these technologies is increasing rapidly.

New models for grid usage such as virtual net metering, peer to peer trading etc. are being examined, including but not limited to:

- Where a farmer has multiple network connections, they can have renewables connected to the main NMI/account, and credit against consumption at a separate pump connection against the solar generation (with a 'grid transport fee');
- A farm business could generate enough power at one site with a bioenergy plant to cover the consumption at a number of separate (but nearby) sites, by offsetting that consumption against generation at the main site (with a 'grid transport fee).

NIC is working in partnership with Australia's agriculture peak bodies and with government on programs which support the uptake of viable off and on grid renewable energy generation and storage. We are alert to the emerging opportunities in energy policy and the technologies that provide alternative options, enabling farm businesses greater control over their energy supply and costs.

In 2014, NIC convened a group of peak agriculture bodies *(Ag Energy Taskforce*[3]*)* to draw attention to the impacts of the high cost of energy for Australia's highly efficient and productive agriculture sector. High energy costs have been a significant factor in impeding Australia's transition from a 'mining boom' to a 'dining boom'. The Australian Farm Institute noted in late 2018: *Australian industry –*

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[2] *A comparison of cotton bales/hectare from rainfed crops against those with partial or full irrigation, illustrates the impact of limited water on plant growth and resulting crop yield.*
In 2018-19 the cotton industry grower's survey reported 1.47 bales/hectare as the average yield for rainfed, 8.08 bales for partial and 10.23 bales for full irrigation. 1 bale = 217.7kg. Source 2019 survey p13.

[3] *Agriculture Energy Taskforce: National Irrigators' Council, NSW Irrigators' Council, NSW Farmers, Cotton Australia, National Farmers' Federation, Bundaberg Regional Irrigators Group, Central Irrigation Trust (SA), CANEGROWERS, Dairy Connect, Queensland Farmers Federation, Australian Grape & Wine, Pioneer Valley Water, Australian Dairy Farmers, Dairy Australia*

including agriculture – is rapidly becoming uncompetitive against countries with cheaper and more reliable power. [4]

NIC and the Taskforce have consistently argued the need for a **long-term price ceiling of eight cents for electrons and eight cents for distribution** – 16 cents per kilowatt hour total maximum.

With the world population forecast to exceed 9 billion by 2050, there is a significant role and opportunity for the irrigated agriculture sector to be at the forefront of the increased world demand for high-quality food and fibre, grown under high standard conditions and regulations.

Frequency Controlled Ancillary Services

The Options paper notes that as part of the **Immediate reforms** there is work *underway to refine frequency control arrangements and, in particular, address the potential need for enhanced arrangements for primary frequency control and a new market for fast frequency response.* As noted in our earlier submission, this is a matter that must be addressed as a priority.

As detailed in NIC submission of October 2020, frequency control arrangements can have the effect of imposing unbudgeted and retrospective costs on consumers for an anomaly in the system over which consumers have no influence, and without a way of avoiding these unacceptable cost hikes

We have previously cited the experience in South Australia of Central Irrigation Trust (CIT), who received a retrospective $60,000 increase in their power bill for a single month due to AEMO (Australian Energy Market Operator) providing a frequency controlled ancillary service (FACAS) to provide grid stability as a result of the failure of the interconnector.

CIT supplies irrigation water to 1200 Riverland fruit, vegetable, grape and nut farmers, where these businesses are already burdened with increased cost because of drought and high energy prices.

It is clear why ancillary services are called upon to stabilise the grid, though there is something very wrong with National Energy Market (NEM) rules, where under current arrangements, these charges are passed on to consumers.

NIC has raised this matter in a number of forums, following which we received approaches from AEMO who committed to look at ways to alleviate the spike in costs in the future. It is important that these issues continue to be flagged, and impacts understood, as and when they occur.

We note the ESB has identified a spot market approach for valuing and procuring inertia as a long-term priority, in the first instance relying on the current arrangements for TNSPs (transition network service providers) to procure minimum levels of inertia along with the potential to use a SSM (system services mechanism) to procure additional inertia when required.

The Options paper suggests there could be advantages to progressing to a spot market to co-optimise the supply of inertia with frequency control services, operating reserves and energy. The paper notes that in the medium to longer term, the operational challenges of managing the power system with very high levels of renewables will become clearer and new technologies will arise to supply the necessary services. The paper also notes that these may require further refinement to the spot market and structured procured arrangements.

As noted earlier, this may be an attractive way if (as suggested) it could extend to incorporate the demand curves for some services rather than a fixed demand requirement, purchasing services in a manner which maximises the value of the services provided.

[4] *Australian Farm Institute: The impacts of energy costs on the agriculture sector, August 2018*

Tariff and Pricing Reform and Metres

NIC welcomes the Options paper focus on tariff and pricing reform which suggests that pricing reform is progressing slowly, with most networks initially adopting 'opt in' models for transferring customers to cost-reflective network tariffs, and that more recently, distributors are starting to require customers to 'opt out' of cost reflective network tariffs.

Farmers and irrigators, in particular, occasionally have significant capacity to engage in specific programs to temporarily reduce load at peak times. Queensland irrigators have been working with their energy providers for some time on specific use tariffs in this area.

Rolling out this type of system may require some effort to provide sufficient education, knowledge and suitable equipment (including the meters) for those who might be able to take advantage.

There is potential for many irrigators and primary producers to participate in peak demand shifting, and depending on the watering needs of crops, on farm infrastructure or other requirements such as cooling - permanent arrangements can be made to avoid peak use. Automation of systems will assist in making this possible – for example, automated watering systems can reduce the need for manual labour and make overnight watering more practical.

The ESB notes the limited penetration of smart meters for residential and small business customers across the NEM (outside of Victoria) is also limiting tariff reform uptake. In December 2020, the AEMC commenced a review of the rules governing electricity meters to see what more might be needed for increased take-up of smart meters, and whether roles and responsibilities around metering under current arrangements should be revised to drive retail innovation.

The ESB suggests that in the short term, the implementation of the Wholesale Demand Response Mechanism in October 2021 will provide insights as to the conditions required for demand-side resources to participate effectively.

From our perspective, this is a good outcome as a transitional measure and designed to put demand response on equal footing with generation capacity, adding to the resources capable of providing resources at times of need.

We have previously argued for a rule change which would enhance the ability of agricultural energy consumers to access lower prices by way of better access to wholesale demand response mechanisms. The rule change can be a positive contributor to enabling primary producers - particularly those with substantial demand from irrigation pumps, processing, packaging or cooling - to better structure their energy use to avoid peak or critical demand periods and therefore bring down their overall power costs.

It is critical that when the new rule comes into force, there are additional opportunities for consumers to access these arrangements with any price benefits passed on to consumers.

It is important to highlight the research undertaken for the Ag Energy Taskforce by Sapere Research Group (funded by Energy Consumers Australia), "Empowering Irrigation Consumers Electricity Purchase Arrangements", indicating the clear knowledge gap among irrigation energy consumers.

Respondents generally indicated they would like to be able to engage in demand response, but felt they would not be able to, whereas assessment of their actual energy consumption indicated that their operations were suitable for appropriate demand response management. The work undertaken in concluding this, included surveys and interval data analysis. The outcomes are discussed in NIC submission of October 2020.

Smart meters at end-user premises, as opposed to simply metering energy use for bulk billing purposes, are required to provide vital information. Smart meters allow both distributor network businesses and electricity end users to have better information on how energy is consumed, and to better control that use, including in the use of end-user generation systems.

According to the Energy Networks Association (ENA) "*As technology and energy markets develop rapidly, smart meters and other devices will benefit individual consumers. Customers should receive practical information and more rewarding tariff structures that match their needs; be able to control their energy use to get better deals and participate in new markets, such as exporting energy to the Grid through solar panels or supporting energy storage options as these develop commercially*"[5].

While rules are now in place that will allow for a very gradual transition of consumers to smart meters ie, when a meter upgrade is required or following the completion of the solar bonus scheme, we believe that if future grid needs are to be catered for, it is critical that transition to smart meter solutions should occur much more rapidly.

There are many issues to be resolved to facilitate the roll out of smart meter technology, including:

- issues of smart meter connectivity in regional areas due to telecommunications blackspots
- data privacy and security concerns associated with smart metering arrangements
- education of consumers so they are aware of the shift away from 'bulk' electricity pricing on to time of use and load based metering
- the transitional arrangements for historical costs associated with older meter installations as metering responsibilities shift away from the network companies and on to retailers; and
- transparency of metering costs for consumers as retailers take on metering responsibilities
- the supposition that the smart meter will inform and therefore cause the consumer to change their consumption behaviour, or that they have the ability to do so[6].

In many cases, larger agricultural users have been mandated to 'upgrade' their meters to smart or interval-based metres at their own cost. We believe that the challenges associated with a smart meter roll out must be addressed in order to develop a full understanding of our network capacity and the energy needs for the future NEM.

It will be important that network rules allow for localised solutions. The regulatory process should enable the market to respond quickly to allow for widespread adoption of these technologies that would allow customers to increase the utilisation of electricity networks.

For example, businesses in regional areas would benefit from the ability to 'net-off' their generation and use or trade with nearby sites, paying a small fee for the use of the local network (network transportation fee) rather than full network and retail costs. Solutions such as peer-to-peer trading may offer greater local network utilisation and stability, offering new revenue opportunities for DNSPs and result in less sub-optimal options such as 'do nothing' or eventual independence from the grid.

Distributed energy generation may represent a cost-effective approach to increasing the reliability of electricity supply above current grid levels. It may also be accompanied by cost measure benefits of 'local energy trading system' – where utilities can provide customers with solar and storage and allow their output to be traded in a suburban network. Such approaches require significant changes in the way incumbent utilities (eg Ergon, Essential Energy) manage their business models and will require networks to look to a more 'distributed' model, while implications for centralised generation, and for retailers, will also be significant.

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[5] *Changing the Face of Energy Management. Electrical Comms Data. Jan/Feb 2015. Vol. 14 No.6. pp. 32-34.*

[6] *Plant affected by heatwaves can't 'go indoors' as the advice to urban dwellers, hence 24hrs guaranteed supply of irrigated water to a crop at these times can be the difference of having a crop or not. It is a similar situation for maintaining chilled milk pending collection for it to meet human consumption health requirements.*

The rule changes required to allow this to occur must be initiated urgently to ensure that for those who wish to remain connected to the electricity network, this is a viable option for regional businesses, and in fact, the preferred option.

We would advocate that network rules must promote new solutions and not protect existing owners.

Regulated Asset Base (RAB)

We have long flagged the need to ensure that as part of market transition and future market design, the RAB (regulatory asset base) of electricity network and transmission businesses are at efficient levels, and not over-inflated. This issue remains central to ensure that end users are not asked to meet any inflated costs of systems, tools, regulatory frameworks and market arrangements that result in a gold plating of the system.

Consumers should not be expected to meet the costs of an expensive system that has arisen due to a perverse application of the rules where electricity networks are receiving significant returns combined with a 'gaming culture' from the providers of energy and distribution services.

We have consistently raised the need for a comprehensive assessment of the economy-wide costs and benefits of revising the electricity network and transmission businesses' regulated asset bases to efficient levels. The assessment should include an examination of the potential reinstatement of the original (pre-2006) NEM rules that required the regulator to optimise the transmission and distribution network regulated asset bases.

This issue was picked up in the 2018 report on *Retail Electricity Pricing Inquiry* on the RAB write down, where the ACCC recommended that *the governments of Queensland, NSW and Tasmania should take immediate steps to remedy the past over-investment of their network businesses in order to improve affordability of the network. With appropriate assistance from the Australian Government, this can be done:*

- *in Queensland, Tasmania and for Essential Energy in NSW, through a voluntary government write-down of the regulatory asset base*
- *in NSW, where the assets have since been fully or partially privatised, through the use of rebates on network charges (paid to the distribution company to be passed on to consumers) that offset the impact of over-investment in those states.*

Such write-downs would enhance economic efficiency by reducing current distorting price signals. The amount of the write-downs and rebates should be made by reference to the estimates of overinvestment by the Grattan Institute, and should result in at least $100 a year in savings for average residential customers in those states.

Disappointingly, there has been no progress to date on this matter.

Technology Investment Roadmap and Bioenergy Roadmap

Attention is again drawn to the opportunities for the agriculture sector in the Technology Investment Roadmap and the development by ARENA of the Bioenergy Roadmap.

While these issues do not directly and currently form part of the ESB's examination of post 2025 market design, they will in due course feed into and/or impact broader market design issues.

The uncertainties around the current investment climate, with investors holding off due to their view that expectations of forward prices are not at levels or durations that would support significant investments are understood, as is the uncertainty around technology costs for renewable and storage resources, timing of large thermal exits, demand risk and the impact of jurisdictional investment schemes.

Renewable Energy Zones (REZs)

We note the ESB's consideration of approaches to implementing REZs, also against the backdrop of actions being taken by state governments. And the need to introduce reforms to lessen the likelihood of the access of REZ generators to customers being degraded by the connection of other generators outside the REZ and also of other REZs.

These are not matters on which NIC is able to provide technical input, though we recognise potential medium-term options to manage these issues which might assist towards a long-term solution for transmission access.

REZs will play a role in delivering affordable energy generation through the period of the anticipated retirement of thermal power stations over coming decades. And battery storage will be a critical component in the development of REZs.

We expect REZs to integrate and not compete with the grid. We also expect these zones to integrate with agriculture and provide opportunities rather than being a 'paddock vs panels' competing land use pressure or result in the loss of highly productive agricultural land. We would hope they also enable the development of downstream processing and manufacturing in these centres.

A process that fits within the state planning regimes that helps determine the business case and/or value proposition in relation to developments of REZs will be necessary, as will engagement with communities and identified regions via the usual processes.

Equity in pricing

NIC recognise the challenges for the electricity grid with the rapid growth of variable renewable energy into the system. The Energy Security Board annual report card released in February 2020 focused discussion on grid capability noting the challenges within current grid design.

NIC has frequently outlined significant concerns with the equity of network pricing. Excessive return built into pricing for network owners is imposing unsustainable costs on farmers, inequitable pass-through costs are punishing agricultural consumers for issues they have no control over; and restrictive rules (albeit sometimes related to network capacity) are even making it hard for farmers to export power generated on site into the grid or via virtual private networks.

It is recognised that investment will be required to ensure transmission and distribution networks have the capacity to cope with the injection of renewable energy into the grid, the cost of which will ultimately be passed on to consumers – as per the example of the FCAS charges imposed (p 3).

The equity of network related charges is directly relevant to a bioenergy strategy, because they act firstly as disincentives to the take up of on farm grid connected generation and secondly the cost of integration and poor integration is passed through producing a very real negative perception for consumers and the broader community.

Storage

The importance of storage remains a critical component, including through pumped hydro storage, battery storage and demand response as well as utility scale and distributed resources. And with the increased uptake of renewables, the issue of battery storage and associated costs is increasingly urgent to support grid stability.

Storage capability, particularly adjacent to solar farms, will work in conjunction with market operators to identify and alleviate congestion in the grid. Battery storage installations are increasing, enhancing the capability to the behind the meter generation and storage in households. This trend is predicted to continue with some jurisdictions offering interest free loans to install solar battery systems.

Digitalisation is opening new opportunities for customers to manage and value their load and their distributed energy resources or to have them managed on their behalf.

In progressing future market design, it is hoped the ESB will consider the ability of farmers who chose to utilise storage, have the capacity to connect to the grid if they chose at reasonable cost and potentially be part of virtual micro grid opportunities.

Stand-alone power systems (SAPs) & Microgrids

It is expected that over time there will be opportunities for a developed bioenergy sector to provide energy to stand-alone power systems.

NIC and the Ag Energy Taskforce provided submissions to the Australian Energy Market Commission (AMEC) in support of the development of SAPS. The falling costs of renewable generation and batteries represents a decrease in the costs of providing off-grid electricity supply, and in some areas off-grid supply may now be less costly than standard supply.

There are potential benefits such as improved reliability for remote customers and reduced carbon footprint. To date, the relatively few customers currently receiving supply from a SAPS can largely be attributed to limitations in the regulatory frameworks and the embryonic nature of the SAPS industry.

The move towards a nationally consistent framework is enabling distributors to develop off-grid supply arrangements for existing customers or new connections where efficient - as identified in the *Finkel Review into the Future Security of the National Electricity Market* and the *2018 ACCC report into retail electricity pricing.*

In terms of regulatory frameworks, we acknowledge that some form of regulation supports assurance to consumers about the quality of the service/product and an assurance about price efficiency of that product. However, we strongly caution against the imposition of additional costs associated with unwarranted and unnecessary regulation around the development of SAPs.

The various models of electricity supply for customers will be delivered through:

- the interconnected grid – which the AEMC refers to as “standard supply”
- an embedded network, which in turn is connected to the interconnected grid
- a micro-grid isolated from the interconnected grid
- an individual power system (IPS), which only provides electricity to the customer in question.

Productive agriculture and climate challenges

NIC recognises the agriculture sector’s responsibility, and the challenges, in meeting the climate change task, participating in the broader effort to contribute to global action and meeting community expectation to reduce emissions.

Climate variability is not new for the sector which has over a long period worked to adapt to significantly water availability during times of drought. For the irrigated agriculture sector in particular, irrigation storages and the trading platform have been built in Australia as a way of ensuring capacity to produce food and fibre during prolonged dry conditions. The ability to store water for use in dry times is the very essence of irrigation, serving as one of many drought mitigation measures and as a climate change mitigation measure.

Climate change and climate change policy impacts on irrigators in two key areas – water supply (including changes in run-off into catchments) and energy policy.

While efforts to ameliorate climate change impacts on the environment are supported, it is not possible to avoid all negative impacts, and it would therefore not be reasonable to expect food and

fibre producers and their local communities to bear the whole burden. There must be a balance which is fair and equitable, especially among those parties who are equally impacted by climate change.

The success of agricultural businesses depends on the capacity of the sector to continue to innovate and adapt, using best practice to manage climatic risks and securing investment for the future. This includes the uptake of opportunities provided for the sector's participation in carbon markets to contribute to Australia's emissions reduction goals.

Energy costs continue to present a major barrier for Australian irrigated agriculture. Energy for pumping and pressurising irrigation water is a significant part of the cost structure for food and fibre production, reducing industry competitiveness.

The sector expects to play a part in moving to lower carbon emissions and meeting Australia's international obligations and community expectation. The evidence shows that agriculture has been an enthusiastic leader in the take up of renewable energy, especially where it is able to be shown to be cost effective and/or beneficial for the farming business.

NIC and the Ag Energy Taskforce have actively participated in consultations on energy related policy development and advocated programs supporting the take up of renewable energy by food and fibre producers.

Australia's agricultural industries play a significant role as economic drivers in local economies, providing flow on benefits to the national economy. Industries include cotton, rice, sugar, wine, almonds, horticulture and dairy.

Australian farmers and agriculture industries are embracing technology to enhance production and operational efficiencies, and increasingly farmers are adopting renewable energy solutions to manage the cost of electricity, off-set unavoidable peak demand charges and working to decarbonise the 'energy mix'.

Despite the impact of prolonged drought and the significant challenges facing some industries, the value of farm production is expected to be $59 billion in 2019-20, supported by high commodity prices in some sectors. [7] Over the past ten years, electricity costs have increasingly become a significant cost input factor in Australia's food and fibre production, impacting the ability of farmers and industries to remain internationally competitive while utilising modern, water-efficient irrigation equipment.

Clean Energy Finance Corporation (CEFC)[8] data shows a progressive commitment among Australian farmers to invest in energy efficiency and renewable energy technologies. In the last three years farmers have taken up loan incentives offered by the CEFC, spending over $100 million on 417 on grid and 20 off grid solar power projects, more than any other single sector. These projects were also on average larger than other sectors, with loans almost seven times the average at over $250,000. Farmers took additional loans with the CEFC to the value of $100 million during this time, to improve the energy efficiency of farm buildings and production systems.

The true picture of agricultural investment will be somewhat higher as these figures do not include projects where farmers have purchased renewable or energy efficiency technologies outright or sought funding elsewhere.

[7] *ABARES Agricultural Overview: March quarter 2020*

[8] *The Clean Energy Finance Corporation (CEFC) is responsible for investing $10 billion in clean energy projects on behalf of the Australian Government to assist lower Australia's carbon emissions by investing in renewable energy, energy efficiency and low emissions technologies.*

While agriculture industries are taking up the opportunities available to them in the global effort to reduce emissions, it is also important to recognise that farmers and their respective industries will generally invest in these opportunities only if there is an economic imperative with a sound operational and business case, and not solely from an emissions reduction perspective.