Irrigators and on-farm solar

ELECTRICITY is an important input for irrigated agriculture, but rising costs have constrained NSW and Qld growers and impacted their profitability, competitiveness and on-farm operations.

As a result of the increases in electricity prices, growers have investigated a range of options to reduce their electricity costs, including the use of on-farm solar PV and other related technologies. The growth in solar PV is evident by the increasing number of small, medium and large solar sites across NSW and Qld and the increasing number of connection applications (AEM0 2018).

The abundance of land and sunshine in regional Australia, provides an opportunity for growers to explore options for on-farm solar PV in order to reduce electricity costs, increase productivity and utilise a clean source of energy. Despite the interest and growth in farm-solar PV, growers have encountered a range of barriers and challenges in the installation and utilisation of solar energy on-farm.

On-farm research undertaken

To explore these barriers and challenges, Cotton Australia, the Queensland Farmers' Federation (QFF) and the NSW Irrigators' Council (NSWIC) have conducted further research. A research project titled *Irrigators – the flow on benefits of regionally embedded generation* was initiated and sought to:

- Identify the challenges experienced by growers who have installed (or were planning to install) solar energy on-farm with the intention to feed excess energy back into the electricity grid.
- Analyse network connection application processes and the associated barriers that limit growers from feeding on-farm generated solar energy back into the electricity grid.
- Assess the previous amendments to NER (Chapter 5A) to determine if it had improved the connection process for solar PV generators under 5MW to connect to the electricity grid.

The objective of the project was to identify the unique challenges of growers in regional NSW and Qld with the connection, installation and integration of on-farm solar PV. The project also tried to identify possible policy and regulatory options to improve and simplify the connection process. It also tried to identify mutually beneficial options for future solar energy projects that can be pursued jointly by growers and network businesses.

Technical

- Integration of the solar PV system with existing on-farm equipment
- Identification of an optimal location for the solar PV system to connect to dispersed on-farm infrastructure assets
- Understanding the export capacity of the grid to size the on-farm solar PV system accordingly
- Management of local network constraints.
- Standardisation of the services provided by solar suppliers and installers
- Acceleration of technological advances in solar PV systems and battery storage

Economic

- Determination of the value of on-farm solar PV systems if it is not continuously used throughout the year and/or when export opportunities are limited
- Change in electricity tariffs creating uncertainty about future energy costs and the viability of the on-farm solar PV systems
- Management of large upfront costs for a high quality solar PV system and technical expertise
- Address potential additional augmentation costs to enable export opportunities
- Understanding the connection fees and other ancillary charges

Information

- Access to quality information, expert advice and quality assurance processes to be confident the on-farm solar system is fit for purpose and operates efficiently with the existing on-farm equipment
- Engagement between growers, network businesses and suppliers to ensure the regulatory and operational environment is understood
- Transparency of the network decision-making process for connections, export capacity and the interaction between different solar PV applications
- Consistency of information and technical advice (networks and suppliers)
- Unclear determinations of export thresholds for large-scale solar farms and smaller connections

Barriers and challenges

Growers identified a range of barriers and challenges with the planning, design, installation and connection of on-farm solar PV systems.

Although some of the barriers and challenges exist due to the complexity of the network connection process, there is a significant lack of grower expertise which prevents them from effectively engaging with the network companies.

Growers are also often not able to scrutinise the advice of the solar PV supplier/installer. The unclear determination of the connection process and the lack of a quality assurance scheme for solar PV panels and installations has also generated a lack of trust in growers. This has also led to additional costs and delays.

A case for change

- Improve the hosting capacity of the networks to enable more connection opportunities for growers.
- Impose accreditation requirements for solar PV installers with the Clean Energy Council to allow growers to identify suitable solar PV suppliers/installers.
- Review NER Chapter 5 amendments to assess more broadly whether improvements to the connection process have been realised for growers in regional areas.
- Improve the communication and engagement between growers, network businesses and solar PV suppliers/installers to ensure a clear and transparent information flow. This would also ensure technical requirements and operational constraints are understood.

Cane Case Study – Bundaberg irrigators give it a go

An innovative solar PV project in the Bundaberg region has been operational since 2018. The project 'Adapting Renewable Energy Concepts to Irrigated Sugar Cane Production at Bundaberg' has been led by the Bundaberg Regional Irrigators Group (BRIG) with the funding support of the Australian Renewable Energy Agency (ARENA).

The aim of the project is to reduce irrigators' dependence on grid supplied electricity through the installation of a large-scale solar PV system capable of delivering a comparable irrigation supply to the established distribution system.

The project faced challenges and delays due to a number of compliance issues with innovative new equipment and the grid connection standard. In particular, the grid connection specifications for all inverters and similar technologies to AS/NZ4777.2: 2015 Grid connection of energy systems via inverters was a serious impediment to the installation and operation of the solar PV system.

Despite these challenges, data obtained from the project indicate that the new integrated solar PV system has led to a 70 per cent reduction in grid-supplied electricity use and a reduction in irrigation cost from $1.30 to $0.39 per tonne of sugarcane.

The PV system also has potential for productivity gains on farm including the full utilisation of water allocations and additional cropping opportunities.

Grower-to-grower recommendations

- Know your needs and the limitation of the site
- Be informed about the supplier, the quality of the installation, and the technical/legal/regulatory requirements
- Explore all opportunities and consider building your on-farm solar footprint slowly and strategically
- Know the process for connecting to the grid and prepare for extensive waiting periods and factor in additional costs

Drawn from: *Irrigators – the flow on benefits of regionally embedded generation*. This research project was funded by Energy Consumers Australia Limited as part of its grant process for consumer advocacy projects and research projects for the benefit of consumers of electricity and natural gas – *www.energyconsumersaustralia.com.au*

For more information: Queensland Farmers' Federation – Ph: 07 3837 4720. ■

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