



On Farm Connectivity Program Discussion Paper

NBN Co Ltd response to the Australian Government

March 2023

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1 Executive Summary

NBN Co Limited (**NBN Co**) welcomes the opportunity to share insights about on-farm connectivity and the benefits this can bring to the Australian economy. NBN Co supports the Australian Government's commitment of \$30 million to enable the On Farm Connectivity Program and supports the proposal as outlined in the associated discussion paper (**Discussion Paper**).

The Australian agriculture sector has set itself the ambitious target of increasing the farm-gate value of agricultural production to \$100 billion by 2030; this is an objective supported by NBN Co. Research suggests that the 'unconstrained adoption' of digital agriculture could add up to \$20.3 billion per year to the value of the Australian agriculture sector;¹ NBN Co research found that three quarters of this value uplift can be obtained through internet-enabled digital agriculture.²

Through our extensive stakeholder engagement, NBN Co has identified some of the digital capability barriers that it considers are preventing the uptake of digital agriculture. Digital capability includes knowledge about digital connectivity, literacy, confidence and ability; the combined low rating in the agriculture sector represents the greatest barrier to the adoption of digital agriculture. Particularly notable and relevant amongst these is low digital literacy with respect to the way networks, such as the nbn® network, mobile telephone networks and other solutions can combine to support on farm digital agricultural connectivity, applications and devices. Low rates of digital literacy, and in particular, limited understanding of the right questions to ask of whom and when, need to be addressed if the full benefits of the On Farm Connectivity Program are to be realised.

Helping small- and medium-sized, often family-owned, farming enterprises successfully adopt digital agricultural practices will require a fit-for-purpose digital agricultural literacy program, which ensures farmers know what solutions are most suitable to their particular circumstances. Such a program is essential to narrow the digital capability gap that exists between operators in the agricultural sector and others in Australia. For this program to succeed, a solution must be found for the significant capability leap required for the agriculture sector to thrive in a digital environment.

This submission highlights the extensive work NBN Co has already undertaken with key stakeholders to identify and address the digital capability gap in the agriculture sector. We are pleased that the Discussion Paper acknowledges this work. In addition, NBN Co sees that the proposed establishment of an 'Eligible Service Provider' list is consistent with the accreditation/QA Mark proposal outlined by NBN Co in December 2021.

NBN Co stands ready to continue working with the Australian Government, other telecommunications network operators, technology, agtech and platform providers, and the wider agriculture sector, to drive the uptake of the On Farm Connectivity Program objective of enabling digital agriculture's contribution towards industry's \$100 billion by 2030.

¹ Accelerating precision agriculture to decision agriculture, Australian Farm Institute, November 2018

² Connecting Australia Future of Farming, November 2020



2 About NBN Co

NBN Co is the Government Business Enterprise responsible for the construction and operation of the **nbn** network in accordance with Commonwealth Government policy. NBN Co is committed to responding to the digital connectivity needs of all Australians; working with industry, governments, regulators and community partners, to lift the digital capability of Australia.

As a provider of ubiquitous broadband internet services across Australia, via a multi-technology mix, NBN Co is in a unique position to support the deployment of the digital connectivity necessary to support digital agriculture now and into the future. Through retail service providers, NBN Co delivers high-speed broadband to customers across Australia over an area of more than seven million square kilometres; the availability of **nbn** Satellite services to some of the most remote regions in which agriculture operates in Australia means that connectivity can be made available to support digital agriculture nationwide.

Our mission is to ‘lift the digital capability of people across Australia’. Through the **nbn** network, Australia is the only continent to have access to ubiquitous, fast internet³. In addition to the supply of wholesale broadband services to Australia, NBN Co also supports the development of the individual digital skills and capabilities necessary to participate as fully as possible in the digital economy. Through our dedicated **nbn** Local team, for example, more than 60 staff living and working in regional, rural and remote Australia are supporting communities to understand the capabilities of the nbn network and the benefits of this digital connectivity to their homes, businesses and communities.

As neither an ‘eligible equipment service provider’, nor a ‘primary producer’, (as defined in the Discussion Paper) from whom feedback is principally sought, NBN Co provides general feedback about the scheme from the perspective of digital literacy and capability.

³ Bureau of Communications, Arts and Regional Research, “Working paper - Economic impacts of ubiquitous high speed broadband: agriculture sector”, May 2021, <https://www.infrastructure.gov.au/media-centre/publications/working-paper-economic-impact-ubiquitous-high-speed-broadband-agriculture-sector>



3 Untapped Potential: On farm connectivity

Helping Australian farmers unlock the opportunity of digital agriculture is a focus for NBN Co. By lifting the digital capability of Australia’s agricultural sector, NBN Co can assist Australian farmers to make more informed decisions, save time and grow productivity. As outlined below, research has shown that digital agriculture can play a significant role in lifting the farm-gate value of the Australian agriculture sector; it has also shown that farmers lack the digital capability and literacy skills necessary to fully embrace this digital revolution, suggesting that a lack of digital confidence is holding back adoption.

Research by the Australian Farm Institute found that the ‘unconstrained adoption’ of digital agriculture by Australian farmers could add up to \$20.3 billion to the value of Australian agriculture by 2030⁴. In 2020, NBN Co released research which found that internet-enabled digital agriculture could add up to \$15.6 billion to the sector’s outputs each year by 2030; this represents a 20% increase on 2019 production figures⁵.

Further research released by AgriFutures Australia⁶ found that (based on long-run average production values) the delta between the sector’s 2019 outputs and the ambitious \$100 billion by 2030 goal was roughly equivalent to the value that could be added through the ‘unconstrained adoption’ of digital agriculture. This demonstrates the important role of connectivity to support the sector’s growth and achievement of its ambitions.

Over the past three years, in particular, NBN Co has deepened already-strong relationships with key agricultural stakeholder groups, farming systems bodies, research and development corporations and government agencies to collaboratively address the challenge of digital capability and lower than average digital literacy among Australian farmers.

3.1 Australian Broadband Advisory Council AgTech Expert Working Group

In 2020, the former Australian government established the Australian Broadband Advisory Council (**ABAC**), which subsequently established an AgTech Expert Working Group (**Working Group**) to enquire into the connectivity needs of the agriculture sector. Co-chaired by leading telecommunications industry lawyer, Peter Waters, and former National Farmers’ Federation board member and agtech industry entrepreneur, Andrea Koch, the expert working group engaged extensively with the agriculture sector and network providers, including NBN Co.

⁴ “Accelerating precision agriculture to decision agriculture”, Australian Farm Institute, November 2018

⁵ Connecting Australia Future of Farming, November 2020

⁶ AgriFutures paper



In their final report released in 2021, the Working Group made a series of findings regarding the current and future state of Australia’s regional broadband capabilities.⁷ They referred to ‘salt and pepper’ connectivity across regional Australia; they highlighted that while connectivity maps may indicate coverage is available, the on-the-ground experience would suggest that coverage may be patchy or non-existent. Some of their recommendations concerning the operation of the **nbn** network in regional Australia are being addressed through the Fixed Wireless and Satellite Upgrade Program (**FWSUP**)⁸ and other enhancements to network infrastructure.

To address ‘salt and pepper connectivity’, the report highlighted the need for ‘local ecosystems of digital skills across a stack of technical capabilities’, and identified:

- Advice on connectivity options;
- Selection and installation of agri-tech solution;
- Data aggregation and integration; and
- Digital agronomy/farm management decisions

as the areas where ‘skills are currently very thin on the ground and need to be close at hand for the farmer – waiting for a technician to drive hundreds of kilometres to fix a critical agtech application can affect crop or livestock value’.

Essentially, the Working Group found there was market failure across regional Australia with respect to sufficient, suitably qualified and available technology and connectivity experts to support farmers wishing to engage in or adopt digital agriculture. They argued that there was a role for Government to address this in the short term, by providing the digital connectivity literacy support necessary to enable the digital transformation of Australian agriculture in accordance with research and industry expectations.

3.2 Fixed Wireless and Satellite Upgrade Program

At the time of writing, NBN Co is working on important upgrades to our Fixed Wireless and Satellite networks courtesy of \$480 million in grant funding from the Australian Government and an additional \$270 million in internal investment.

The Fixed Wireless and Satellite Upgrade Program (**FWSUP**) aims to provide faster speed and more data to more people living in regional Australia. It will improve access to the connectivity necessary to enable digital agriculture. Under the FWSUP, it is expected that:

1. Approximately 120,000 regional Australians will be eligible to shift from nbn® Satellite to nbn® Fixed Wireless; enabling up to 750,000 Australians to connect to the nbn Fixed Wireless network^{9,10},

⁷ Report of the Australian Broadband Advisory Council AgriTech Expert Working Group, <https://www.infrastructure.gov.au/sites/default/files/documents/agri-tech-expert-working-group.pdf>

⁸ See section 3.2

⁹ As cited at <https://www.nbnco.com.au/blog/the-nbn-project/latest-investments-to-provide-another-boost-for-the-bush>

¹⁰ By December 2024



2. Available speeds across the nbn Fixed Wireless network will increase with two new higher speed tier products:
 - Fixed Wireless nbn Home Fast is expected to be available to 100 per cent of the expanded Fixed Wireless coverage area and be capable of delivering a wholesale peak information rate of 100-130 Mbps download speed and an upload speed of 8-20 Mbps;
 - Fixed Wireless nbn Superfast is expected to be available to approximately 85 per cent of the expanded Fixed Wireless coverage area and be capable of delivering a wholesale peak information rate of 200-325 Mbps download speed and an upload speed of 8-20 Mbps¹¹.
3. For customers on nbn Satellite services:
 - increased data allowances will be available on **nbn**® SkyMuster®
 - access to increased speeds and longer periods in which usage is unmetered will be available for nbn SkyMuster Plus customers

Some of these changes came into effect for farm businesses relying on **nbn**® SkyMuster Plus® on 1 July 2022. For these businesses, a variety of eligible agricultural activities can be undertaken without any draw on monthly data allowances¹².

In addition to the FWSUP, premises in regional Australia will be eligible to access Fibre to the Premises (**FTTP**) technology, as NBN Co extends the reach of the fibre network into more communities. These changes will benefit the agricultural supply chain, with regional businesses supported with access to faster speeds.

3.3 Digital capability and Australian agriculture

Digital capability, which includes knowledge about digital connectivity, literacy, confidence and ability, represents the greatest barrier to the adoption of digital agriculture. Uncertainty about knowing what questions to ask, who to ask and whether the advice received is fit for purpose is key feedback NBN Co has received from farmers through our stakeholder engagement.

3.3.1 Online Skills Check and Resourcing Tool

In 2021, NBN Co launched the **nbn**® Online Skills Check and Resources (OSCAR) tool. OSCAR is a high-level digital capability measurement tool, assessing the digital capability of users across four areas:

¹¹ An end customer's experience, including the speeds actually achieved over the **nbn**® network, depends on the **nbn**® access network technology and configuration over which services are delivered to their premises, whether they are using the internet during the busy period, and some factors outside **nbn**'s control (like their equipment quality, software, broadband plan, signal reception, and (with the exception of Sky Muster Plus) how their service provider designs its network). Speeds may also be impacted by the number of concurrent users on the **nbn**® Fixed Wireless network, including during busy periods.

¹² Subject to applications and platforms not connecting via a Virtual Private Network. Unmetered data exclusions and fair use conditions apply. Video streaming and VPN traffic count towards the monthly data allowance between 4pm and midnight. **nbn** may, at its discretion, reduce the speed of traffic to slow wholesale speeds.



1. Online knowledge
2. Device usage
3. Data and e-safety
4. Online communication

At the conclusion of the survey, users are given a rating which can be used to compare their capabilities with others in their identified sector and/or community. Further, an online resources platform points users in the direction of reputable learning resources which can assist users to increase their digital capability and to become more confident and capable online. Since launch, more than 12,000 Australians have completed the survey, including more than 650 who have self-identified as being involved in the agriculture, fisheries and forestry sector¹³.

Overall, farmers self-identified capabilities in data and e-safety, and device usage scored marginally behind those for the general population, whereas farmers rated marginally above the general population in online communication; the result for online knowledge was the same. However, farmers indicated that the necessity for digital skills capability was more important to them than the general population considers these skills. Finally, when it came to the adoption of technology, farmers rated behind the general population for adoption of new technology.

When the overall results for the agriculture sector are compared against those for the education, health, arts and tourism segments, the average digital capability score sees agriculture rank behind all segments, except for tourism (which had the same score). For digital skills importance, agriculture ranks third (behind the education and health sectors). When it comes to the uptake of digital technology, agriculture is noticeably behind all sectors, demonstrating that farmers' adoption of technology lags other sectors; reduced adoption of digital agricultural technology is driven by a demonstrated capability gap not present in other sectors.

3.3.2 Digital Participation Research findings

Recently completed NBN Co digital participation research has found a lack of confidence amongst Australian farmers when it comes to digital capability. Based on self-assessment, almost 40% of farmers rated their digital capability as being three or below¹⁴; this compares with similar ratings of 12% and 20% in the education and healthcare sectors, respectively.

Specific online activities, such as saving to the cloud, determining what is safe to download, adjusting privacy settings, and setting and entering passwords, were more likely to have a lower capability rating associated with them amongst farmers, with 46% rating their capability to complete such tasks as a three or below (lower capability). This is compared to 25% and 23% in the education and healthcare sectors, respectively, for these specific tasks.

¹³ As at 10 February 2023

¹⁴ On a scale of 1-5, where 5 is Extremely Capable and 1 is Not at all capable



In agriculture, providers are participating in a range of general digital activities, however use of agriculture-specific technologies is lower. Of respondents, around 26% state they would like to be utilising more agriculture-specific technologies.

The significant difference in (perceived) digital capability in the agriculture sector represents a barrier to the adoption of digital agriculture.

3.4 Stakeholder engagement

NBN Co works closely with stakeholders across the agriculture sector to drive deeper understanding of the capability of the **nbn** network to support digital agriculture. We have worked closely with key stakeholders to develop a range of materials aimed at lifting digital capability in the agriculture sector.

Collaboration within the agricultural sector will be essential to the successful achievement of the industry's objective of \$100 billion by 2030, to the realisation of the opportunities of digital agriculture, and the successful delivery of the Government's On Farm Connectivity Program. Through a mix of research, thought leadership, consultation and direct engagement, NBN Co has contributed to the debate within the agriculture sector about the digital capability needs of Australian agriculture. We've sized the prize, identified the pathways and developed programs aimed at improving the sector's digital capability and connectivity literacy.



3.4.1 Future of Farming research

In September 2020, NBN Co released research¹⁵, as part of the Connecting Australia series, which found that internet-enabled digital agriculture could add up to \$15.6 billion to the sector's pre-farm gate outputs each year by 2030; this represents a 20% increase on 2019 production figures. The increase is attributed to:

- \$8.0 billion for decision support technologies;
- \$4.3 billion for sensors and monitoring equipment;
- \$3.3 billion for deployment of robotics and increased automation; and

By farming system:

- \$5.7 billion for dryland cropping;
- \$4.3 billion for extensive livestock;
- \$3.7 billion for irrigated cropping and horticulture;
- \$1.2 billion for fisheries;
- \$700 million for intensive livestock; and
- \$100 million for forestry.

Finally, the research found that digital agriculture could unlock up to \$1.2 billion in premium agrifood export markets by 2030, reduce input costs for broadacre farms by around 7 per cent and save almost three hours per worker per week due to enhanced automation driven by digital agriculture.

3.4.2 Future of Farming Roundtables Report

In November 2020, NBN Co released the Future of Farming Roundtables Report¹⁶. The report, authored by Robbie Sefton AM, followed engagement with Australia's agricultural Research and Development Corporations (**RDCs**) and briefing about the Future of Farming research. During the roundtables, representatives of the RDCs were asked three questions:

1. What are the barriers to agtech adoption?
2. What are three current agtech priorities for your organisation?
3. How do you believe NBN Co can support your organisation to increase agtech adoption?

Four key themes emerged:

- **Connectivity** – Understanding connectivity, both availability and 'how to' and the various connection options available was a common discussion thread.
- **Digital confidence and literacy** – A lack of confidence in and understanding of the benefits of digital agtech was coupled with perceived digital illiteracy.
- **Data** – Governance of and trust in data privacy and security.

¹⁵ nbn Connecting Australia research, <https://www.nbnco.com.au/blog/business/reaping-the-benefits-ag-set-for-15-6-billion-boost>

¹⁶ Future of Farming Roundtables Report: <https://www.nbnco.com.au/content/dam/nbnco2/images/blog/nbn-future-of-farming-roundtables-report.pdf>



- **Independent advice and support** – the need for a trusted source of digital advice being available, allowing farmers to sense check their digital plans and provide in-field technical support as the need may arise.

In her foreword, Ms Sefton called for enhanced collaboration across the agriculture sector to achieve the ambitious aims for \$100 billion in farm gate output by 2030.

3.4.3 Connecting Australian Agriculture paper

In November 2021, NBN Co and the National Farmers’ Federation (**NFF**) released the Connecting Australian Agriculture paper¹⁷. The paper looked at the role of digital technology in agriculture and combined the views of leading industry experts speaking about the challenges and opportunities ahead for the industry.

Agtech decision wheel

The paper included the agtech decision wheel, a five-point matrix to assist decision makers on their agtech journey. The five points on the wheel include:

1. **Connectivity** – what connectivity (mobile or broadband) is available where, and where is it needed?
2. **Value** – what value can be achieved through the adoption of digital agriculture?
3. **Capability** – what skills do I have, and what will I need, to successfully deploy agtech into my farm business?
4. **Technology** – what types of devices, platforms and apps can support my farm business digital needs?
5. **Data** – what information do I want to collect and how does that support improved on-farm decision making? How secure is the data I am collecting?

4 Getting Connected: the Connecting Australia’s Agricultural Landscape discussion paper

In December 2021, NBN Co released the Connecting Australia’s Agricultural Landscape discussion paper¹⁸. The paper proposed developing a ‘Quality Assurance (QA) Mark’ to apply to network extension devices that would support the wider adoption of digital agriculture and assist farmers’ understanding of network extension capabilities.

¹⁷ Available for download at <https://www.nbnco.com.au/content/dam/nbn/documents/about-nbn/reports/reports-and-publications/connecting-australian-agriculture-report.pdf>

¹⁸ See Appendix



4.1 Quality Assurance Mark proposal

The original proposal envisioned the creation of a device-based accreditation system (similar to the well-known Telstra Blue Tick program)¹⁹ which would assess the capability and suitability of various devices used to extend the range of home-based internet connections into the farm environment. The proposal included a draft set of criteria against which devices may be assessed; feedback about the concept and the proposed criteria was sought from a range of stakeholders.

In addition to seeking written submissions about the proposal, NBN Co conducted a series of virtual stakeholder roundtables, speaking directly to farmers, farmer representative bodies, agtech vendors and research agencies.

While there was broad support for the concept proposed, the combined feedback from stakeholders indicated that a device-based scheme was overly complicated and would be difficult to administer. Alternatively, stakeholders preferred that the concept was amended and be based on a communications / technology supplier being accredited in some fashion, such that a farmer was directed to a business to assist them with their on-farm connectivity needs, rather than to a range of devices.

Farmers pointed to the highly complex connectivity ecosystem, including different ways in which various types of backhaul (i.e. mobile and fixed / satellite broadband) could interact in order to deliver more robust on-farm solutions. Farmers also said that they are often time poor and would prefer to engage an expert, or follow the journey of a trusted advisor / friend / neighbour, to ensure the system deployed, and funds invested, were fit for purpose.

4.2 Consultation and feedback

Following these initial roundtables, NBN Co consulted further with key stakeholders about the potential design for the supplier-based best practice framework/accreditation scheme which would support progressing the quality assurance mark (**QA Mark**) concept. Key criteria identified were:

- That any framework should be managed and owned by industry. NBN Co was encouraged to assist and guide the development of the scheme.
 - The way in which the NFF Farm Data Code was developed was identified as one model which could be pursued
- That 'light touch' accreditation was preferable, along the lines of a 'best practice framework'
- That there should be no or low cost to participate
- That an online register should be established, where farmers can self-select a supplier from a list of participating and accredited businesses.
 - A strong preference to link this to the AgTech Finder platform was identified.

¹⁹ Further information about Telstra Blue Tick can be found here: <https://www.telstra.com.au/mobile-phones/blue-tick>



4.3 Next steps

Three clear elements of the accreditation framework were identified in early discussions:

- A consistent set of terms and phrases was required to help ‘standardise’ the language used by industry, assisting farmers and technology advisers to ‘speak the same language’ and more easily compare different proposals
 - The On Farm Connectivity Guide has delivered this first component.
- A standardised planning template be developed, enabling farmers to map out their proposed digital agricultural plan such that it could be shared with technology advisers for an easily compared assessment of alternative proposals
 - As part of the Farms of the Future program, the NSW Department of Primary Industries was developing an online platform to assist this planning; this program was in Beta testing in 2022
- An agreed best practice framework setting out the minimum standards by which businesses agree to participate in the QA Mark scheme
 - These minimum standards would involve agreement to accept the definition of terms as they appear in the Glossary (i.e. On Farm Connectivity Guide) and to use the standardised planning template to provide quotes and advice

Of these three elements, the Best Practice Framework was considered the most resource-intensive, requiring additional financial resources to scope, develop, embed and monitor. To date, no further work has been progressed owing to the lack of available financial assistance to deliver the project. As explained in Part 5 of this paper, NBN Co considers that the proposed creation of an Eligible Service Provider list mirrors the proposed accreditation approach; NBN Co would cease any further development of a separate QA Mark in favour of supporting the proposal outlined in the Discussion Paper, should that be adopted by the Government.

5 Digital literacy Initiatives

To narrow the demonstrated digital capability gap in Australian agriculture, NBN Co has worked to address feedback from Australian farmers and their advocates about digital connectivity literacy. The release of the On Farm Connectivity Guide (the **Guide**) was the first step on the journey towards the QA Mark outlined in part 4. However, to ensure the success of the On Farm Connectivity Program, NBN Co encourages the Government to consider the role a parallel, dedicated and properly resourced digital agricultural literacy program can play in overcoming the capability gap.

5.1 On Farm Connectivity Guide

In November 2022, the NFF and NBN Co launched the Guide, Australia’s first single source document defining key terms used in connectivity and agriculture. In addition to providing a definition for almost 100 commonly-used terms, the Guide provides a series of questions for farmers to consider as they embark upon their digital agriculture journey. The Guide responds to the stated concerns of farmers about the complexity of phrases and terminology used in connectivity.



The Guide can be downloaded from the NFF and NBN Co websites.

5.2 Similar grant programs

NBN Co observes that Victoria and New South Wales have developed similar grant program models to that proposed in the discussion paper, with the similar purpose of supporting the uptake of digital agriculture. In the case of the NSW Government's *Farms of the Future* program, NBN Co has worked with the NSW Department of Primary Industries to ensure that the connectivity capability of the **nbn**[®] network is considered as a solution to support on-farm connectivity under the scheme.

NBN Co also observes that in both programs, grants were initially offered in defined geographic locations (and, in Victoria, with a focus on particular farming systems found in these regions) and were supported by dedicated staff on the ground to assist farmers in the planning, selection, deployment and assessment of the solutions deployed.

5.3 Digital literacy training

NBN Co notes the statement contained on page 7 of the Discussion Paper regarding digital literacy training being 'not in scope for the Program'.

While digital literacy may fall outside the direct funding parameters of this program, NBN Co is firmly of the view (as evidenced by our own research and stakeholder engagement) that digital literacy training will be essential to the successful delivery of this program, its ability to drive adoption of digital agriculture and its role in supporting industry's \$100 billion by 2030 ambitions.

To ensure that this program does not simply accelerate the adoption of (more) digital agriculture by early/first adopters, NBN Co believes that a structured and properly resourced on-farm digital and connectivity literacy program will be essential if the program's stated benefits for agriculture are to be adequately met and exceeded.

5.4 Regional Tech Hub

The Regional Tech Hub (the **Hub**) is playing an increasingly valuable role in supporting regional, rural and remote communities to understand the opportunities of, and benefits from participating in, the digital economy. NBN Co works closely with the Hub; the independent connectivity reports supplied by the Hub to people in regional Australia will be an essential component in developing on-farm connectivity plans necessary for the operation of on-farm connectivity infrastructure, systems and platforms.

While the Hub could assist in providing digital literacy support for this grants program, NBN Co believes this would require a significant additional investment in the Hub's capability, particularly if it were to involve one-to-one consultation about bespoke on-farm connectivity solutions.

Recognising that no two farms are the same (beyond just farming systems related issues, there are additional issues as they relate to geography, topography, availability of backhaul services, etc),



providing bespoke advice to Australia's 85,000+ farm businesses²⁰ would be a significant undertaking.

Further, on-farm connectivity and digital agriculture solutions are not 'set and forget' arrangements; as technology evolves, and the digital needs of the business change, adaptation to new technologies is required. Farmers have indicated their preference for technical advisers who can be available beyond just the installation of the necessary infrastructure, and to be on hand to assist with troubleshooting, repair and upgrade as time goes on. Understanding how the Hub could support this desire will be essential to determining their role in providing support in the longer term.

5.5 Drought and innovation hubs

There may be a role for the Drought and Innovation Hubs, established in the Department of Agriculture, Fisheries and Forestry, to provide more localised digital connectivity support. Given the links that these hubs have in their geographically-defined area, they may be well placed to support localised education and awareness of the solutions relevant to farmers in a particular area. They can also provide this advice in the broader context of business resilience coaching and support.

5.6 Case studies and farming system-specific advice

In discussions and engagements conducted by NBN Co, farmers have also expressed interest in case study explainers that demonstrate the specific utility of technology suitable to their particular farming system. Working in partnership with the research and development corporations and local farming systems groups, a digital literacy program sitting alongside the On-Farm Connectivity Program could support the staged adoption of the connectivity systems necessary to support the apps, platforms and devices relevant to modern farming, thus allowing the sector to reach and exceed the \$100 billion target by 2030.

By way of example, working with a dairy farming systems group could provide advice to dairy farmers about how to operate:

- Point to point systems between the house, sheds, stock yards and dairy, thus enabling real-time monitoring of milk temperatures and volumes, for sharing with the supply chain, and possible remote video monitoring for farm worker safety and animal welfare management;
- LoRaWAN-style systems which can connect water points and feed pads, as well as livestock, to monitor the availability of water, consumption of feed and movement of animals (thus supporting enhanced animal welfare management); and

²⁰ As cited at <https://farmers.org.au/farm-facts/>



- ZetiRover²¹-style systems which connect utility vehicles and farm machines, providing ‘always on’ hot spot connectivity for the farmer when moving across the farm.

Through the establishment of a local demonstration property, the host farmer can show other farmers in the district the benefits of their systems, lessons learned about things that went right and wrong, and things to consider in the planning and deployment of digital agriculture. They can also demonstrate the role that farm topography (such as hills, valleys, tree banks etc) can play and how to effectively manipulate signal range, strength and direction in order to provide necessary coverage for the farm business in places where it is required.

Farmers have indicated that farming system-specific information will assist them to better understand what opportunities may be available to them. While some information, such as connecting a farmhouse and sheds/outhouses could be considered farming system neutral, understanding the specific use cases and systems benefits connectivity can bring will help to more quickly unlock the potential productivity uplift which digital agriculture can deliver. The specific needs, opportunities and benefits for farmers with intensive production systems will vary from broadacre and horticulture sectors.

5.7 The role of industry

There remains an important role for agriculture industry organisations to support and encourage the adoption of digital agriculture. As previously demonstrated, NBN Co has engaged extensively with a diverse range of stakeholders, across government, industry and sector experts to address the digital capability gap in the sector.

Industry has rallied to support the NFF’s Roadmap 2030, which spells out the case for the Australian agriculture sector to grow its pre-farm gate value to \$100 billion by 2030. The sector is therefore uniquely poised to leverage this unanimity and focus to drive the faster adoption of digital agriculture. Leveraging the direct to farmer engagement capabilities of key stakeholders to narrow the digital literacy and capability gap will be important to the uptake of digital agriculture by Australian farmers; as noted earlier, farmers seek out trusted advocates to validate decision making and sense-check their curiosity.

NBN Co encourages the Government, through its agencies, to coordinate digital literacy and capability programs to align with the broad themes of the On Farm Connectivity Program and support the uptake of grants. NBN Co believes it has much to contribute and stands ready to assist with any such approach.

²¹ As cited at <https://zetifi.com/products/zetirover/> The citation of this particular product should not be considered an endorsement of this product by NBN Co.



6 Eligible service providers

NBN Co supports the proposal outlined on page 10 of the Discussion Paper, requiring solutions providers to be approved as an ‘eligible provider’ under the scheme. We particularly note:

“Eligible equipment service providers will be required to meet a series of criteria that will ensure primary producers can have confidence in purchasing connectivity solutions that meet their needs as primary producers and improve digital connectivity on their farms.

Eligible equipment service providers will also be required to demonstrate their qualifications and track record as a mature commercial operator in the market...”

As noted at Sections 4.2 and 4.3 above, this approach is broadly consistent with the proposal by NBN Co to establish a QA Mark linked to suppliers of agricultural connectivity services and support. NBN Co would not seek to duplicate this structure by progressing the QA Mark proposal at this time, should the On Farm Connectivity Program go ahead as presently designed.

6.1 Types of solutions

Feedback from stakeholders has suggested that there are at least three types of services required and provided to farmers in support of digital agriculture:

- **Connectivity-only providers:** providers of network infrastructure that enables the use of any agtech device or platform to operate over the established network
- **Connected device providers:** providers of devices which contain proprietary connectivity capability, ensuring the device may operate without the need for additional connectivity network infrastructure
- **Managed solution providers:** providers of network infrastructure, devices and platforms that supply a managed solution for the farmer, and may or may not be closed to the addition of further devices.

NBN Co encourages the Government to consider ways that the eligible provider list can specify which of these categories, and any additional categories identified, an eligible provider can support. The establishment of this preferred supplier list can potentially form the basis for wider consideration of the proposed QA Mark which, if developed with adequate cross-industry consultation, can become a reputable means of assisting farmers to extend connectivity to support agtech on their farms.

NBN Co also encourages the Government to consider ways in which the extant [AgTech Finder](#) platform can be incorporated into the grants program. Previously administered by the Food Agility CRC, and under licence from KPMG, the AgTech Finder platform is an established repository of information about agtech devices. Considering how this can be combined with advice about connectivity to support agtech would be a valuable addition to the site’s capabilities.



7 Conclusion

The On-Farm Connectivity Program offers Australian agriculture the opportunity to accelerate the adoption of digital agriculture and achieve its ambitious \$100 billion by 2030 objectives. Research suggests the program can support the 'unconstrained adoption' of digital agriculture and the \$20.3 billion opportunity that has been identified.

There is a demonstrated digital capability and literacy shortfall in the Australian agriculture sector. Research by NBN Co has found that farmers' lack of digital capability and confidence is a key factor slowing the uptake of digital agriculture.

To ensure this program can deliver the very best outcomes for Australian agriculture, NBN Co believes a parallel digital literacy and capability program is essential to ensure that farmers can maximise the value of their investments and ensure fit for purpose digital agricultural connectivity solutions are deployed.

While industry is clearly and purposefully united behind and aligned to the \$100 billion by 2030 vision, ensuring adequate connectivity underpins digital agriculture and innovation will require a concerted and coordinated effort to achieve success.

A dedicated agricultural digital literacy program can (and should) be broader than simply the Department of Infrastructure, Transport, Regional Development, Communications and the Arts – other agencies such as the Commonwealth Department of Agriculture, Fisheries and Forestry, state and territory based agricultural departments and agencies, RDCs, national and state/territory peak industry and state farming bodies and farming systems groups, together with providers of connectivity services, must be engaged.

Further information about the work of NBN Co to support digital capability in the agriculture sector can be sought from Robert Hardie (Executive Manager – Health and Agriculture) via roberthardie@nbnco.com.au.