



Demand Management Innovation Allowance Mechanism Compliance Report

Submission to the Australian Energy Regulator

2022-2023

PowerWater

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Introduction

Purpose and compliance

The Australian Energy Regulator (AER) applied a Demand Management Innovation Allowance Mechanism (DMIAM) to Power and Water Corporation (Power and Water) for the 2019–24 regulatory period. The DMIAM provides distribution networks with funding for research and development in demand management projects that have the potential to reduce long term network costs.

Demand management projects should:

- have the potential to deliver ongoing reductions in overall demand and/or peak demand;
- be innovative; and
- not be an efficient and prudent non-network option that a distributor should provide under its regulatory proposal.

In its final determination for the 2019–24 regulatory period, the AER provided Power and Water with total funding of \$1.57 million (\$2017-18) under the DMIAM. Under the mechanism, Power and Water can spend the funding amount on AER approved eligible projects during the 2019–24 period. If Power and Water does not spend the full amount on AER approved eligible projects, there may be a revenue adjustment in the next period equal to the shortfall.

Power and Water is required to submit an annual compliance report to the AER setting out the projects that have been undertaken under the mechanism for the past regulatory year. The 2022-23 regulatory year is the fourth year the DMIAM has applied to Power and Water.

The information provided in this report will also be reflected in the relevant sections of Power and Water's Annual Regulatory Information Notice (RIN) for 2022-23.

DMIA projects summary

In the 2022-23 period, Power and Water identified the following research and development projects in demand management that comply with the DMIAM criteria:

Table 1 Total DMIA project spend FY2022-23

Project	Description	Cost (ex GST)	Status
Network visibility and forecasting	Assessment of network data and systems to improve visibility, better incorporate distributed energy resources (DER) and manage increasing two-way energy flows.	\$263,636.40	Ongoing
Future Network	Comprehensive strategy to cost-effectively and safely transition Power and Water's networks in line with the clean energy goals of the Northern Territory.	\$607,642.35	Ongoing
Total 2022-23		\$871,278.75	

Table 2 DMIA actual and remaining expenditure for RP2019-24

Expected spend	Cost (ex GST)
2019-20 DMIA project spend	\$0.00
2020-21 DMIA project spend	\$0.00
2021-22 DMIA project spend	\$342,741.55
2022-23 DMIA project spend	\$871,278.75
Remaining for RP2019-24	\$355,979.70
Total allowable DMIA spend for RP2019-24	\$1,570,000.00

Power and Water confirms that the costs of the projects specified in this report are:

- Not recoverable under any jurisdictional incentive scheme;
- Not recoverable under any other Commonwealth or State Government scheme; and
- Not included as part of:
 - The forecast Capital Expenditure or the forecast Operating Expenditure; or
 - Any other incentive scheme applied by the 2019-24 Distribution Determination.

DMIA project development and selection process

Power and Water are required to maintain safe, reliable and affordable electricity for Northern Territory customers, while supporting the Northern Territory Government's target of 50 per cent renewable energy consumption by 2030, as well as the aims and objectives set out in the Darwin-Katherine Electricity System Plan (DKESP), Alice Springs Future Grid Roadmap and Remote Power System Strategy¹.

Power and Water identified the need for demand management programs and technologies as part of readying the network for significant changes in the transition of its generation and supply composition. This was highlighted as a priority within the Future Network Readiness Plan² outlined in Power and Water's DMIAM Compliance Report during the 2020-21 regulatory year.

Several projects were identified as priorities for demand management in the Future Network Readiness Plan, including:

- **Small-Scale Network Visibility and Dynamic Operating Envelopes (DOE) pilot** to trial improved visibility and optimisation of the network;
- **Dynamic Operating Envelopes (DOE) pilot** to trial DOEs;
- **Network Visibility Options Assessment** to implement low-cost ways to improve visibility of the network and DOEs;
- **Community Battery Feasibility Study** to understand the role of community batteries; and
- **Electric Vehicle (EV) Charging Impact Research** to proactively prepare for EVs.

Analysis and stakeholder engagement undertaken as part of Power and Water consultation on the above topics identified further work programs of benefit to Northern Territory network customers, which are outlined in greater detail below.

Power and Water also engaged several subject matter experts to advise on demand management programs and assist in developing implementation plans.

Power and Water is committed to expanding and sharing Power and Water's knowledge and outcomes from its demand management innovation projects.

¹ Territory Renewable Energy, Electricity System Plans, <https://territoryrenewableenergy.nt.gov.au/strategies-and-plans/electricity-system-plans>

² Power and Water, Future Networks Readiness Plan, https://www.powerwater.com.au/__data/assets/pdf_file/0022/94261/Future-Networks-Readiness-Plan.pdf

DMIA project updates

Network visibility and forecasting

Nature and scope

The network visibility and forecasting project seeks to improve the accuracy and validity of Power and Water's network visibility capability, in particular for network planning, operating and forecasting purposes. Initial work was undertaken to establish a proof of concept at a small scale. This is now being expanded into a whole of network congestion and capacity dataset which will identify network constraints and demand management opportunities. In terms of network visibility, this project will help to identify network data black spots, future focus of data acquisition, and data quality issues. In terms of network forecasting, this project will develop tools to calculate network congestion and constraints.

Power and Water intends to work with a range of stakeholders and business partners to test the interoperability of real time visibility with future market interfaces. This project will integrate with market-based work being trialled in the Alice Springs Future Grid.

Aims and expectations

Power and Water is working with GridQube and other technology partners to enable visibility of the operating state of the network in near real time. This work helps to inform future network expenditure needs, identify investment required for accommodating greater renewables and DER, and develop robust business cases for undertaking identified investments.

This work also provides Power and Water greater visibility over customer generation and demand through improved real-time access to metering data. This is essential for managing greater penetration of DER, improving the management of customer connections, and safely managing network system constraints.

Compliance with DMIA criteria (as outlined in section 2.2.1 Project Criteria of the Demand Management Innovation Allowance Mechanism guideline)³

DMIA Criteria	How the project aligns
(a) be a project or program for researching, developing or implementing demand management capability or capacity;	Historically, Power and Water's network operations have been without the visibility or ability to respond to two-way energy flows in its networks. This network visibility and forecasting project seeks to address network constraints through better management of growing DER and facilitating more effective demand management.

³ Australian Energy Regulatory, Demand management incentive scheme and innovation allowance mechanism, <https://www.aer.gov.au/networks-pipelines/guidelines-schemes-models-reviews/demand-management-incentive-scheme-and-innovation-allowance-mechanism>

(b) be innovative, in that the project or program: i) is based on new or original concepts; or ii) involves technology or techniques that differ from those previously implemented or used in the relevant market; or iii) is focused on customers in a market segment that significantly differs, from those previously targeted by implementations of the relevant technology, in relevant geographic or demographic characteristics that are likely to affect demand.	This work is utilising innovative software developed as part of the Solar Enablement Initiative (SEI), partly funded by ARENA and led by the University of Queensland⁴.
(c) have the potential, if proved viable, to reduce long term network costs.	This program is expected to result in significantly improved visibility and operability of Power and Water's networks in managing various demand management requirements, improving safe operation of the network and reducing the need for more costly network replacements.

Implementation approach

Work began on the Network visibility and forecasting project in FY2021-22 and is being undertaken by software specialists, GridQube. This work remains ongoing.

The work completed to date involves:

- Assessment of the current state of network asset data and network metering data, conducting a gap analysis, identifying potential errors, and facilitating data quality improvements;
- Assessment and data transfer of GIS shapefiles into a compatible and uniform ESRI functionality;
- Assessment of power flow system visibility and commentary of effect of customer connections;
- Assessment of capability requirements to ensure effective integration with future network system needs; and
- Options analysis for the best approach in implementing network visibility including identifying means of alleviating minimum demand issues and integrating DOE solutions.

In FY2022-23, the focus of the workstream was:

- Development of the visualisation tool, Grafana, which involves incorporating all PWC GIS data, cleaning the data errors to join upstream-downstream traces, incorporating metering data, overlaying a voltage map with GIS, importing SCADA data and enabling real-time updates.
- Integrated and upscaled servers to incorporate a constraint engine into Power and Water's Alice Springs Future Grid team to support the Power Partnerships program. This will be an ongoing component of this project.

⁴ Australian Renewable Energy Agency, Increasing Visibility of Distribution Networks, <https://arena.gov.au/projects/increasing-visibility-of-distribution-networks/>

Outcomes and evaluation approach

Whilst many of the above activities will be progressed across FY2021-22 to FY2023-24, key activities completed in this regulatory period include:

- Development of the visualisation tool, Grafana, which incorporates Power and Water's GIS data, SCADA data, and metering data (providing voltage, current, power factor, real & imaginary export, temperature, and hosting capacity datapoints);
- Development of information systems underpinning the Power Partnerships Program (see Power Partnerships Program section below), including integrating the constraint engine into Power and Water's Alice Springs Future Grid team;
- Development of network visibility options;
- Providing data and insights to support the DOE Regulatory Business Case;
- Providing data and insights to support Power and Water's Expression of Interest application to the ARENA Community Battery Fund; and
- Providing data and insights to support the AER Export Services RIN.

In addition to the above, GridQube digitised and automated data collation from metering and PV and GIS databases through application of SQL software. This allows Power and Water to readily collect and analyse export service data for a range of further data applications. In the first instance, Power and Water was able to use this process to respond to the AERs request for export service matrix. This will enable significant cost and time savings for future requests of this nature as well as improving export operations.

Costs/Benefits

Table 3 DMIA project spend FY2022-23

SME	Workstream	Cost (ex GST)
GridQube Pty Ltd	Network Visibility and forecasting	\$263,636.40
Total		\$263,636.40

The network visibility work is providing invaluable expertise and network insights to Power and Water to enable effective automated and real-time operation of various DER. The assessment work is expected to deliver an automated system for Power and Water to effectively integrate and operate two-way energy flow systems.

Benefits will be quantified following completion of the program. Power and Water will look at the best options to share learnings of this work following its review.

Table 4 Total expected project spend

Expected spend	Cost (ex GST)
2021-22 Project spend	\$75,454.55
2022-23 Project spend	\$263,636.40

Expected total project spend	\$660,000.00
Remaining	\$320,909.05

Next steps

This work remains ongoing and is expected to be completed in FY2023-24. Following the work completed in the FY2022-23, this project will focus on developing real-time hosting capacity calculations, continuing to improve network visibility, partnering with power providers to verify grid outages, and focus on solar flexibility and demand side work.

Power and Water will conduct a review of the program following its completion to determine benefits and value in expansion.

Future Networks

In 2022-23, the Future Networks program comprised of two main components:

1. Completing the Future Network Strategy
2. Commencing the Power Partnerships Program

Future Network Strategy

Nature and scope

Power and Water developed the Future Network Strategy to outline the planned initiatives underway over the next 5–10 years to support the decarbonisation of the NT economy in response to feedback from community, government and industry stakeholders.

A key focus of the strategy was to manage increasing penetration of DER through initiatives such as:

- DOEs;
- Distribution Battery Storage;
- Export tariff trials;
- Smart meter installation;
- EV charging and smart appliance optimisation; and
- Energy efficiency.

The Future Network Strategy both communicated Power and Water's forward-looking strategy to the public and informed Power and Water's overall strategy and expenditure plans in the 2024-2029 regulatory proposal.

Aims and expectations

The aim of the Future Network Strategy is to promote the long-term interests of customers by articulating Power and Water's vision of the future network, identifying what future capabilities will be needed and outlining how Power and Water can achieve this to maximise the value delivered to customers.

The Future Network Strategy is a 10-year strategy and will be updated periodically to account for changes in technology, customer preferences and the economic, regulatory and policy landscape.

Compliance with DMIA criteria (as outlined in section 2.2.1 Project Criteria of the Demand Management Innovation Allowance Mechanism guideline)⁵

DMIA Criteria	How the project aligns
(a) be a project or program for researching, developing or implementing demand management capability or capacity;	A key focus of the Future Network Strategy is to highlight opportunities for demand management programs and technologies that can maintain security and reliability of NT networks while managing costs for customers. Initiatives include investigating the case for:

⁵ Australian Energy Regulator, Demand management incentive scheme and innovation allowance mechanism, <https://www.aer.gov.au/networks-pipelines/guidelines-schemes-models-reviews/demand-management-incentive-scheme-and-innovation-allowance-mechanism>

	• DOEs; • Distribution battery storage; • Export tariff trials; and • EV charging and smart appliance optimisation. Developing the Future Network Strategy encompassed a number of workstreams which researched the network and customer needs, outlined potential solution options, put forward preferred options, and in some cases developed business cases and implementation plans.
(b) be innovative, in that the project or program: i) is based on new or original concepts; or ii) involves technology or techniques that differ from those previously implemented or used in the relevant market; or iii) is focused on customers in a market segment that significantly differs, from those previously targeted by implementations of the relevant technology, in relevant geographic or demographic characteristics that are likely to affect demand.	The Future Network Strategy reviewed and identified the demand management opportunities best suited to the unique needs of the NT network; a system which is required to support a relatively small number of customers over a relatively widely dispersed area. This required adaptation from solutions applied in other jurisdictions to ensure the right network application and the best outcomes for customers are found.
(c) have the potential, if proved viable, to reduce long term network costs.	Program recommendations provided by the Future Network Strategy prioritised options that would reduce long term network costs if implemented.

Implementation approach

This project was supported by expert advice and content delivery from consulting group Engevity Advisory Pty Ltd (who was acquired by Mott MacDonald Pty Ltd in March 2023) and built on work completed by energy, engineering and economic firms CutlerMerz Pty Ltd, Synergies Economic Consulting Pty Ltd, Ernst & Young, Ekistica Pty Ltd and Energeia Pty Ltd.

The Future Network Strategy provided a guiding framework to prepare the network for Power and Water's long-term vision. Each objective and program is informed by five core principles that underpin the Strategy, which was developed in consultation with customers and key stakeholders. The latest industry thinking and best practices were also adopted to build into the forward-looking strategy. Delivery of the strategy was informed by market and industry research and stakeholder engagement to provide effective and timely recommendations.

During the FY2021-22 regulatory period, Power and Water consulted with customers and stakeholders to understand and evaluate their needs, views and preferences for the future network strategy – this included customers who face barriers to participating in and benefiting from new technologies like solar PV. The consultation forums included: Peoples Panel, Future Network Forum, Reset Advisory Committee, and Small-Medium Business Survey. Further information on each forum is available in the 'Engagement' section

of the 2024-29 Regulatory Proposal.⁶ The consultation forums provided invaluable insight for Power and Water and its advisors. Outcomes and feedback from various stakeholders guided the workstreams delivered by each SME.

Outcomes and evaluation approach

The Future Network Strategy was designed to recommend a set of pilot and trial programs for testing demand management solutions. Initial project recommendations were to include research into:

- customer interaction, including information sessions and interactive portals, tariff reform, and management of two-way energy flows;
- DER management, including review and update of DER connection and registrations and updating DER interaction systems;
- pilot EV charging and integration programs and expand to other CER technologies;
- explore alternative DER flexible connection options and approaches to implement DOEs; and
- enhancing network planning, forecasting and optimisation systems

Following development of the Project in FY2021-22, the Future Network Strategy was segmented into 6 distinct, yet interconnected workstreams, each delivered by a separate SME. These included:

- Stream 1A: Future Network Strategy Project Coordination – Engevity
- Stream 1B: DER Strategy Development – Synergies
- Stream 2A: Community Battery Options Study – CutlerMerz
- Stream 2B: Community Battery Feasibility Roadmap and Implementation of Pilot Program – Ekistica
- Stream 3A: Electric Vehicle Impact Assessment – Ernst & Young (EY)
- Stream 3B: EV Charging Roadmap & Expenditure Forecast – Energeia

After the reviewing the strategy outlined for the EV and community battery microgrid streams (2A and 3A) it was determined that the regulatory business cases for these streams would not be progressed as part of the 2024-2029 Regulatory Proposal to the AER.

In October 2022, a draft Future Network Strategy was delivered by Engevity, with supporting content from Ekistica, Synergies, Ernst & Young, and CutlerMerz. This included executive summaries of each SME's final findings, and recommendations and analysis developed for each workstream for input into the relevant sections of PWC's regulatory proposal. The strategy focused on the justification of network investment costs for the recommended programs which are set to be initiated in the next regulatory period.

Delivery of the Future Network Strategy project was completed in FY2022-23, with minor concluding project tasks expected to roll over into the following regulatory period. A summary of the Future Network Strategy informed the 'Moving to a clean energy future' chapter of the 2024-29 Regulatory Proposal.⁷

In FY2023-24 it is also expected that Power and Water will conduct a review of the program following its completion to determine benefits and value in expansion. A summary of key activities completed under each workstream for FY2022-23 is provided in the following table.

⁶ Power and Water, Regulatory Proposal for the 2024-29 regulatory period, Attachment 1.01: Engagement, https://www.powerwater.com.au/_data/assets/pdf_file/0028/156943/Attachment-1.01-Engagement-31-Jan-23.pdf

⁷ Power and Water, Regulatory Proposal for the 2024-29 regulatory period, Moving to a clean energy future, pp51-60, https://www.powerwater.com.au/_data/assets/pdf_file/0025/156931/Regulatory-Proposal-for-the-2024-29-regulatory-period.pdf

Table 5 Key activities completed under each workstream for FY2022-23

Engevity Advisory Pty Ltd - Future Network Strategy Project Coordination
Power and Water Corporation engaged Engevity to coordinate the Future Network Strategy workstreams and draft their 10-year Future Network Strategy. Engevity program managed the Future Network Strategy workstreams, in particular around the development of options analysis, implementation roadmaps, expenditure plans and business cases. To develop the Future Network Strategy, Engevity reviewed the external drivers and changing environment in which Power and Water operates including changing policy goals, technology trends and physical network challenges. Engevity compared this to the environments and future network strategies of other network businesses. Following this, Engevity collaborated with Power and Water's subject matter experts and executive team to develop a suite of programs and initiatives to evolve the network to meet its objectives over a 5–10-year period.
Synergies Economic Consulting Pty Ltd – DER Strategy Development
Under the DER Strategy Development workstream, Synergies undertook options analysis and developed investment business cases for the 2024-29 regulatory period which included a detailed bottom-up expenditure forecast for the investment required to realise the preferred delivery option. Of the four options analysed, Synergies recommended two distinct options: • Option 3 – Dynamic Operating Envelopes (DOE) Lite This option entails a proactive approach of Power and Water developing a basic DOE capability over 2-3 years and offering dynamic export limits to targeted commercial customers with large rooftop solar. • Option 4 – Future Proof the Energy Transition This option will create new DOE capability within Power and Water, however, compared to Option 3, it would entail a bigger investment in Power and Water's ICT and data systems by extending the application of dynamic export limits across all regulated network customers. Synergies assessed both options to be credible in efficiently managing the expected increase in DER resources that will connected to the regulated networks. However, given that we currently do not have any DOE capability, the delivery risk associated with Option 4 appears to be materially higher than Option 3. Evidence from other DNSPs who have developed a DOE capability indicates that a smaller 'no regrets' initial investment would be a prudent option that could be enhanced over time as required. Considering this deliverability issue, Synergies presented a strategic roadmap for 2022-2034 for Power and Water's consideration.
Ernst & Young - Electric Vehicle Impact Assessment
Ernst & Young's work under the Future Network Strategy delivered an Electric Vehicle Impact Assessment. In FY2022-23, EY assessed the drivers of EV uptake in the NT, learnings from deployment strategies and subsequent challenges being faced in Europe, an analysis of the NT's current state of EV charging, and a jurisdictional scan of renewable energy and EV uptake targets across Australia. EY developed four different options and developed high-level actions and considerations for implementation of options 2-4 and conducted a holistic options comparison and sensitivity analysis, which included deliberation of standards and regulations, connections and tariffs, and data and governance. EY's recommendation was to pursue Option 3: Get Ahead of the Curve which represents the most pragmatic

approach and is aligned with expectations of the community representatives; participants of the People's Panel in Darwin and Alice Springs and feedback from the Future network Forum.

Following this, EY developed a high-level roadmap for 2022-2034 and an expenditure justification.

After the reviewing the high-level roadmap outlined for the EV stream, Power and Water determined that the regulatory business cases for these streams would not be progressed as part of the 2024-2029 Regulatory Proposal to the AER.

CutlerMerz Pty Ltd - Community Battery Options Study

In early FY2022-23, CutlerMerz concluded their community battery options study. Their work explored the potential for a planned and strategic deployment of community batteries, and they delivered four key network scenarios that considered the various investment and deployment options available. The proposed options were evaluated against qualitative and quantitative metrics, with a sensitivity analysis recommended to be completed in the following regulatory period.

CutlerMerz delivered a high-level roadmap of the actions required for Power and Water to implement the preferred options – **Option 2: Launch and Learn** and **Option 3: Value Stack Network Benefits**. CutlerMerz's recommendations considered PWCs lack of experience in deploying and operating community batteries and hence focused on a pilot program to develop capabilities and learnings prior to an accelerated deployment roadmap.

After the reviewing the high-level roadmap outlined for the community battery microgrid stream, Power and Water determined that the regulatory business cases for these options would not be progressed as part of the 2024-2029 Regulatory Proposal to the AER.

Power and Water are still committed to delivering Community Batteries to the Northern Territory and in June 2022 submitted an application to ARENA which would seek funding outside of the regulated expenditure to deploy community batteries across Power and Water's network.

Power Partnerships Program

Nature and scope

To deliver the Northern Territory Government's target of 50% renewable generation by 2030, investment is required to ensure the NT's power system is capable of integrating large-scale batteries, agile thermal generation technology and additional solar.

Every year, the Northern Territory experiences minimum demand days when, due to increased penetration of DER such as uncontrollable solar PV, the system load goes below the safe operating limits of the network (also called 'minimum operational demand'). DER, such as rooftop solar, reduces network demand and further challenges the network limits. In certain conditions the output of uncontrolled solar PV reaches more than 70% of our underlying demand and this is expected to increase over time as DER uptake increases. Under these conditions, there is a greater risk of inducing generator outages that have the potential to result in blackouts.

The Power Partnership Program is a demand response collaboration initiative between Power and Water and interested customers to alleviate this challenge and safeguard the power system as the Northern Territory transitions to a renewable energy future. When a high risk minimum demand day is observed, the

program enables Power and Water to remotely control customer PV systems to reduce generation (such as solar) and/or activate controllable loads in line with the negotiated agreements.

Aims and expectations

The aim of the Power Partnerships Program is to collaborate with commercial customers to bring more load onto the grid during minimum demand days and prevent power system wide blackouts. Power Partnerships is proposed for a 2-year period to maintain grid stability while Power and Water investigate and develop longer term solutions. It is expected that this initiative will be superseded as the NT transitions to a renewable future and initiatives like those outlined in Future Network Strategy are implemented.

Power and Water's current portfolio includes approximately 8MW of capacity, and we are aiming to develop a portfolio of 10MW of load and 10MW of DER customers across the Northern Territory regulated power systems. Whilst Power and Water will look to trial a number of VPP service providers, we will seek to integrate different control systems and control multiple VPP providers concurrently to deliver a single signal to customers.

Compliance with DMIA criteria (as outlined in section 2.2.1 Project Criteria of the Demand Management Innovation Allowance Mechanism guideline)⁸

DMIA Criteria	How the project aligns
(a) be a project or program for researching, developing or implementing demand management capability or capacity;	The Power Partnerships Program is a demand response initiative designed to stabilise the grid when the minimum stable load is at risk of being breached due to the output of uncontrolled solar PV. Pilot programs with a number of potential VPP solution providers will be delivered with remote-control equipment implemented to activate any applicable controllable loads. Preferred options will be deployed to commercial customers as part of an opt-in partnership. This program will develop capability to prevent inducing generator outages, and subsequent blackouts to maintain reliability of the Northern Territory's power system.
(b) be innovative, in that the project or program: i) is based on new or original concepts; or ii) involves technology or techniques that differ from those previously implemented or used in the relevant market; or	The Power Partnerships Program is an innovative solution that has not been delivered in the NT to date. The program relies on innovative communications technologies provided by the OEMs and will help to build Power and Water's understanding and

⁸ Australian Energy Regulator, Demand management incentive scheme and innovation allowance mechanism, <https://www.aer.gov.au/networks-pipelines/guidelines-schemes-models-reviews/demand-management-incentive-scheme-and-innovation-allowance-mechanism>

iii) is focused on customers in a market segment that significantly differs, from those previously targeted by implementations of the relevant technology, in relevant geographic or demographic characteristics that are likely to affect demand.	experience of the role of demand response and VPPs going forward, which will inform the delivery of future innovation programs as outlined in the Future Network Strategy. The Power Partnerships Program targets the large scale commercial and industrial scale market segment as these offer the largest impact for targeted demand response instructions.
(c) have the potential, if proved viable, to reduce long term network costs.	The program will deliver a solution that safeguards the power system while Power and Water continue to update assets, infrastructure, and technology to support a smooth transition to a high renewable and high DER future. Delivery of the Power Partnerships Program will reduce network costs and provide significant benefits to the power system.

Implementation approach

Power and Water are seeking to collaborate with key large-scale business customers with significant controllable solar generation and/or suitable loads such as large commercial & industrial customers, infrastructure operators and government departments.

Power and Water will install remote-control equipment at each customer and on minimum demand days and proactively ask our Power Partnership customers to reduce solar generation and/or activate controllable loads in line with negotiated agreements.

Power and Water will engage Jacana, an NT retailer, to ensure that customers are remunerated at a per kWh rate for any instances where solar systems and/or loads are adjusted. Remuneration will be based on their rated system size and the duration of the event, in line with their Partnership Agreement.

Four technology providers and OEMs will be trialled to test the viability of each technology. These will include ComAp Pty Ltd, SwitchDin Pty Ltd, AZZO Pty Ltd and Greensync Pty Ltd.

Outcomes and evaluation approach

The Power Partnerships Program has helped Power and Water to understand the future of VPPs and smart grid energy management. In FY22-23 Power and Water had the opportunity to trial technology solutions from ComAp and SwitchDin and build meaningful concepts to tackle future problems. Power and Water is still undergoing a pilot program with AZZO and is in ongoing discussions to develop relationships with Greensync.

We will aim to complete pilot programs with all OEMs in the following regulatory period and integrate the technologies to enable Power and Water to deliver a single signal to all Power Partnership customers on minimum demand days.

Costs/Benefits

Table 6 DMIA project spend FY2022-23

Future Network Strategy		
SME	Workstream	Cost (ex GST)
Engevity Advisory Pty Ltd	Future Network Strategy Project Coordination	\$331,128.13
Synergies Economic Consulting Pty Ltd	DER Strategy Development	\$119,154.00
CutlerMerz Pty Ltd	Community Battery Options Study	\$4,745.00
Ekistica Pty Ltd	Community Battery Feasibility Roadmap and Pilot Implementation Program	\$4,207.50
Ernst & Young	Electric Vehicle Impact Assessment	\$68,002.72
	Total Future Network Strategy:	\$527,237.35
Power Partnerships Program		
SME	Workstream	Cost (ex GST)
Eco Tech Electrical Pty Ltd	Equipment supply, installation and commissioning (Data management card, Comap controller, modem and circuit protection)	\$3,550.00
Ogden Electrical Pty Ltd	Installation of Comap Solar Controller and investigate and remove old comms	\$600.00
Supply Partners	Telecom hardware delivery and supply	\$710.00
HK Solutions	Contractor	\$52,760.00
Cell Engineering	Contractor	\$15,060.00
Comap Pty Ltd	PV export control hardware	\$7,725.00
	Total Power Partnerships Program:	\$80,405.00
Total Future Networks		\$607,642.35

Delivery of the Future Network Strategy has provided a range of demand management programs for Power

and Water to implement that will realise savings for network customers while maintaining secure and reliable networks.

The absence of the strategy and its associated recommendations would have meant higher costs, lengthier program delays, and safety and security risks to network users as customer energy resources increased without the right tools, programs, and technologies in place to support their increased penetration.

The Power Partnership Program has empowered Power and Water with the technology and knowledge to maintain minimum stable load and reduce the occurrence of blackouts in the short-term. This short-term solution will safeguard the power system, delivering lower cost reliable electricity to customers in the transition to a renewable future.

Table 7 Expected total project spend

Expected spend	Cost (ex GST)
2021-22 Project spend	\$219,187.00
2022-23 Project spend	\$607,642.35
Expected total project spend	\$981,152.00
Remaining	\$154,322.65

Next steps

Activities related to the implementation of the Future Network Strategy, including DOEs, will wait until the AER confirms the outcome of Power and Water 2024-2029 Revised Regulatory Proposal and the associated DOE Regulatory Business Case. In the meantime, Power and Water will prioritise solar compliance, network visibility and forecasting program, and emergency voltage to manage growing DER deployment and grid integration. Power and Water will focus the remaining Future Networks expenditure under DMIA on delivering the Power Partnerships Program and continue this program into the FY2023-24 Regulatory Period.

Contact

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