NORFOLK ISLAND
Regional Council

Service Review – Electricity

Version Control

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1.0	N/A	24 Sep 2025	Version 1. Noted at Ordinary Council Meeting
2.0	2025/31, 2025/47 2025/199 2026/69	29 Apr 2026	Updated to incorporate recommendations of the Electricity Special Purpose Committee. Noted at Ordinary Council Meeting

Disclaimer:

This Service Review is provided for information and planning purposes only. It reflects circumstances at the time of preparation and may be subject to change.

Executive Summary

Norfolk Island Regional Council (NIRC) supplies electricity to around 1,600 customers through a stand-alone diesel-based system supported by customer-owned solar generation and limited battery storage. The service faces financial and operational pressures with an ageing asset base and an estimated annual funding gap of about $2 million when capital and operational costs are considered.

This review assesses the efficiency, cost profile and sustainability of the service. It outlines potential reform options to improve cost recovery, strengthen capability and support Council's strategic objectives. All findings and cost estimates are indicative and prepared for planning purposes only. Validation will be required through business cases, financial analysis, procurement and formal Council decisions.

Council continues to meet its obligations under the Electricity Supply Act 1985 (NI) and Work Health and Safety legislation. Staff feedback and Day in the Life (DILO) observations were used to identify operational themes and constraints that inform planning and prioritisation.

Strengths

- **Service reliability** - Supply is consistent, supported by local operator knowledge and quick response to faults
- **Community renewable uptake** - Strong investment in rooftop solar and private batteries demonstrates community support for energy transition
- **Reduced diesel use** - Private solar and storage are lowering reliance on diesel generation
- **Workforce commitment** - Staff show ownership and adaptability under constrained resources
- **Asset management framework** - The AMP sets renewal priorities and long-term needs, creating a platform for advocacy and planning
- **Strategic alignment** - The service supports Council's goals for affordability, reliability and energy transition
- **Capital planning visibility** - Linking the AMP to the LTFP provides long-term direction for capital works and staged implementation

Key challenges

- **Funding gap** - Current revenue does not meet the full cost of service delivery, asset renewal and overheads
- **Diesel dependency** - Heavy reliance on fuel creates exposure to price volatility, emissions and supply risks
- **Reactive maintenance** - Absence of a preventive program reduces efficiency, limits planning and weakens audit readiness

- **Workforce continuity** - The service depends on a small team with no formal succession plan
- **Digital capability gap** - No CMMS is in place, reducing visibility, reporting and competitiveness for grants
- **External funding** - Peer councils have secured co-funding while Norfolk has yet to access similar support

Opportunities for reform and transformation

1. **Deficit reduction** - Explore a second battery, introduce structured maintenance planning and use targeted outsourcing to improve efficiency
2. **Service capability** - Establish a preventive maintenance program, integrate CMMS, secure network easements and strengthen workforce planning
3. **Strategic transformation** - Explore Microgrid-as-a-Service models, support EV uptake with daytime charging and consider a voluntary Visitor Energy Contribution

The review confirms the electricity service is essential but under pressure. Community participation in solar and Council's commitment to improvement create a platform for change. A phased approach based on urgency, impact and funding readiness can improve performance, reduce the funding gap and position the service to attract external investment.

Contents

1. Service Review Scope and Purpose

Norfolk Island Regional Council (NIRC) owns and operates the island's electricity network, a critical infrastructure service that provides generation, distribution and network maintenance to about 1,663 connected customers. The service supplies essential power to households, businesses, health and emergency facilities and key community infrastructure.

The electricity service operates under the Electricity Supply Act 1985 (NI), relevant Work Health and Safety (WHS) legislation and applicable environmental and asset management requirements.

This review uses a structured approach to assess service performance and identify potential improvements It draws on the Operational Plan 2025–26, quantitative budget and performance data, the Electricity Asset Management Plan, operational observations, risk register findings and benchmarking against comparable remote and island electricity services.

The scope covers all electricity operations under NIRC's responsibility, including generation, network operations, maintenance, asset management and workforce capability. It does not include retail tariff setting, billing or metering, which are being addressed separately through the independent tariff review commissioned by Council.

The review assesses performance against operational, financial and sustainability benchmarks, and identifies strengths, risks and opportunities for improvement. It also outlines potential initiatives to reduce the ongoing operating deficit and improve long-term cost recovery. All cost and savings estimates are indicative and subject to further analysis. The findings provide input for future planning, decision-making and meeting applicable obligations.

2. Service Summary

Norfolk Island Regional Council (NIRC) is the sole generator, distributor, and retailer of electricity on Norfolk Island. Electricity is generated through a combination of diesel and renewable sources and distributed via a local high- and low-voltage network. BESY Energy supports retail operations including metering, billing and customer account management. Tariff setting is addressed separately through Council's independent tariff review.

- **Service Name:** Electricity
- **Service Paid by:** Service Users
- **Review Period:** May 2025 – July 2025
- **Review Lead:** Scott Hackney, Manager Infrastructure and Services
- **Last Review Date:** N/A
- **Governance:** Service governed by Council and support services.
- **Billing Partner:** BESY Energy
- **Legislative Basis:** Electricity Supply Act 1985 (NI), Electricity Supply Regulation

Scope of Service:

- **Generation**: Diesel generators, solar PV installations and battery storage systems
- **Distribution**: High and low voltage networks, including 44 km of cabling
- **Retail**: Customer billing, dynamic tariffs, and metering services

Key Assets:

- 6 × 1.0 MW diesel generators (3 CAT, 3 Cummins)
- 2 MW Tesla battery system
- 400 kW load bank
- Time-of-use smart meters
- 1.4MW rooftop solar (distributed)

Staffing:

- 5 full-time equivalents (FTEs) and 2 contractors

Customers:

- Approximately 1,663 customer connections (residential, commercial, public sector)

3. Strategic Alignment

Electricity is an essential service on Norfolk Island that supports Council's objectives for sustainability, affordability and infrastructure reliability as outlined in the Community Strategic Plan, Operational Plan and Asset Management Strategy.

Alignment with the Community Strategic Plan

The NIRC Community Strategic Plan sets out the long-term vision for the community. The electricity service contributes to the following outcomes:

- **Reliable Infrastructure**: Ensures access to electricity for homes, businesses and public services
- **Sustainable Community**: Supports the shift toward renewable energy which reduces dependency on diesel and lowers emissions
- **Affordable Living**: Planned metering reform and potential tariff improvements aim to improve fairness and transparency in pricing
- **Resilient Operations**: Helps maintain critical infrastructure and supports emergency response and recovery

Link to Operational Plan Objectives

Delivery of electricity services is guided by actions in NIRC's Operational Plan 2025-26. Key initiatives include:

- Rollout of time-of-use smart metering (target completion June 2026)
- Integration of renewable generation into the grid to reduce diesel reliance
- Reduction of diesel consumption and associated fuel risk (measured as annual litres consumed)
- Customer education on energy use and efficiency measures

Legislative and Regulatory Alignment

The service operates under the following frameworks:

- Electricity Supply Act 1985 (NI)
- Electricity Supply Regulations (NI)
- Environmental protection legislation and workplace safety codes

4. Quantitative Analysis

This section provides an analysis of the electricity service's revenue, expenditure and key operating metrics for FY2025-26. It also includes 2024 actual results to show year-on-year trends and highlights the structural funding gap.

Operating revenue is forecast at $3.75 million against total expenditure of $5.79 million. This results in an operating deficit of about $188,000 and a full-service deficit of more than $1.7 million when capital needs are included. While day-to-day operations are funded, the service is not resourced to meet lifecycle replacement costs under the current model.

Income Statement - 2024 Actuals

The electricity service recorded an operating revenue of $2.9m against expenses of $4.1m, resulting in an operating deficit of $1.3m. Materials and services were the largest cost driver at $2.4m, reflecting contractor use and supply costs. Employee costs of $0.7m and depreciation of $0.8m were steady, while other expenses remained low at $0.2m.

	Orig.				
Income Statement of NIRC - Electricity	2026	2026	2026	2025	2024
	$'000	$'000	$'000	$'000	$'000
	Budget	YTD	Est.	Actual	Actual
Income from continuing operations	3,751	-	3,751	3,985	2,854
Other income	-	-	-	-	-
Total income from continuing operations	3,751	-	3,751	3,985	2,854
Expenses from continuing operations					
Employee benefits and on-costs	1,009	29	1,009	929	725
Materials and services	2,290	12	2,290	3,375	2,446
Depreciation, amortisation and impairment	1,427	-	1,427	1,438	790
Other expenses	1,068	-	1,068	617	179
Total expenses from continuing operations	5,793	41	5,793	6,359	4,140
Surplus/ (deficit) from continuing operations before capital amou	(2,042)	(41)	(2,042)	(2,374)	(1,286)

Revenue Summary FY2025 - 26

The table below shows all electricity revenue sources for FY2025-26. Revenue is almost entirely dependent on customer billing. There is no grant funding in this cycle and no forecast for other commercial income streams.

Revenue Source	**Budgeted Value ($AUD)**	**Notes**
Electricity Income	**3,735,931**	Includes both external billing and internal recovery
Other Sundry Income	15,450	Internal/external requests such as pole relocations etc.
Other User Charges (Sundry)	0	No forecasted activity
Commonwealth Operating Grants	0	No grant income forecasted
Total Income	**3,751,381**	Based on FY2025–26 Proposed Budget

Note on $0 Revenue Lines: These reflect budgeted exclusions. Equipment hire and miscellaneous user charges were not forecasted for this cycle. No Commonwealth grants are secured for electricity operations in FY2025-26. Contra income is unused in this budget.

Expenditure Summary - FY2025 - 26

The following table outlines the full breakdown of forecast expenditure for FY2025-26. It includes employee costs, diesel and materials, depreciation and corporate allocations. These values are taken directly from the adopted budget.

Diesel remains the dominant cost driver, accounting for almost 35 percent of the total budget. BESY's managed billing system is recorded under software licensing. Corporate overheads represent internal costings for shared services like HR, Finance, and Administration. Depreciation and corporate overheads together make up 39 percent (these are fixed allocations and not reducible at the service level).

Category	**Subcategory**	**Budget ($AUD)**
Employee Costs	Salaries and Wages	550,386
	Overtime	93,346
	Casual Wages	88,076

	Superannuation – Council Contribution	76,617
	Other Allowance	175,692
	Staff Training	25,000
	Subtotal – Employee Costs	**1,009,117**
Materials & Services	Contractors	91,000
	Consultants	48,000
	Materials Purchased	33,000
	Inventory Issued from Store	65,000
	Protective Clothing & Accessories	13,000
	Freight Delivery	26,000
	Stationery & Office Consumables	4,000
	Fuel	2,000,000
	Tools/Equipment Expensed	10,000
	Subtotal – Materials & Services	**2,290,000**
Depreciation	Plant & Equipment	2,923
	Buildings Specialised	52,047
	Electricity Infrastructure (Account 0766)	1,371,590
	Subtotal – Depreciation	**1,426,560**
Other Expenses	Electricity (utility cost)	9,000
	Sewerage Charges	3,000
	Telephone Charges	20,000
	Software Licenses	225,000
	Subtotal – Other Expenses	**257,000**
Corporate Overheads	Overheads Charged	810,685
Total Expenditure		**5,793,362**

5. Benchmarking

Benchmarking was undertaken to compare NIRC's electricity service with selected Australian remote and island electricity systems. Comparator locations were chosen based on shared characteristics, including geographic isolation, small population size, reliance on diesel generation and public-sector or government-managed delivery models.

The purpose of benchmarking is to provide contextual insight into delivery models, funding approaches and system characteristics, rather than to establish direct cost or performance equivalence.

Benchmark Locations

Location	Relevance
Lord Howe Island (NSW)	Remote island electricity system operated by the Lord Howe Island Board, comprising a diesel–solar–battery hybrid microgrid supported by Commonwealth (ARENA) and NSW Government capital funding.
Flinders Island (TAS)	Remote island electricity system delivered through a state-owned hybrid energy project operated by Hydro Tasmania, incorporating wind, solar, battery storage and diesel backup, with ARENA co-funding.
Christmas Island (External Territory)	Australian external territory where electricity service delivery, asset funding and tariff-setting are managed under Australian Government Indian Ocean Territories arrangements.
Paroo Shire Council (QLD)	Remote outback local government area where electricity is supplied by Ergon Energy (Queensland Government-owned), illustrating a state-delivered model for high-cost, low-density regions.
King Island (TAS)	Remote island electricity system delivered by Hydro Tasmania through a hybrid renewable program incorporating large-scale battery storage (King Island Renewable Energy Integration Project (KIREIP).

Benchmarking Snapshot

The table below provides a comparative snapshot of electricity service delivery across selected remote and island jurisdictions, highlighting similarities and differences in delivery models, cost pressures, and funding approaches. Publicly available sources are cited where available. Indicative values are shown where precise data is not published.

Indicator	Norfolk Island	Lord Howe Island	Flinders Island	Christmas Island	Paroo Shire (QLD)
Population	~2,000	~400	~900	~2,000	~1,800
Energy Model	Council-owned, vertically integrated (generation, distribution and retail)	Council-owned hybrid microgrid (solar, battery and diesel)	State-owned hybrid energy system operated by Hydro Tasmania (wind, solar, battery with diesel backup)	Electricity delivered under Australian Government Indian Ocean Territories arrangements; system ownership and funding sit with the Commonwealth	Electricity supplied by Ergon Energy (Queensland Government-owned); council does not own or operate electricity assets
Tariff (indicative)	~60c/kWh	Tiered tariffs, with higher domestic usage blocks up to ~50–52c/kWh	Usage charges ~32–33c/kWh plus daily supply charge (Bass Strait Islands tariff)	Commonwealth-set tariffs aligned to WA remote pricing; not cost-reflective	Regulated Ergon Energy tariffs (varies by customer class)
Diesel Use	~1.5 million litres per year	Diesel use reduced by ~65–70% following renewable project (exact annual volume not consistently published)	Diesel retained primarily as backup and firming; volumes not publicly reported	Diesel-based generation supplemented by renewables; volumes not publicly reported	Not applicable (grid-connected via Ergon Energy)

Renewable Share	~20–25% (primarily customer-owned rooftop solar)	≥60–65% annual energy contribution from renewables (solar + battery system design)	Target >60% diesel displacement under hybrid wind–solar–battery system	Variable and project-dependent; no single published renewable share	Not published at council level

Notes on Sources:

- Population figures are indicative and based on ABS QuickStats and publicly available government and council sources. Norfolk Island electricity information is drawn from the Norfolk Island Electricity Asset Management Plan and Service Review.
- Lord Howe Island information is sourced from the *Lord Howe Island Renewable Energy Project Final Report* (2022) and publicly available pricing information.
- Flinders Island information is based on publicly available Hydro Tasmania and ARENA documentation for the Bass Strait Islands.
- Christmas Island information is based on Australian Government Indian Ocean Territories publications and determinations.
- Paroo Shire electricity arrangements reflect Queensland Government supply by Ergon Energy under regulated tariff frameworks.
- Service-level revenue, operating cost and detailed fuel consumption data for comparator jurisdictions are not consistently published**.**

Benchmarking Findings

Benchmarking Findings

Benchmarking indicates that Norfolk Island's electricity service operates under higher structural cost pressures and with fewer external supports than selected comparator jurisdictions. The service maintains reliable supply but faces ongoing financial and capability constraints associated with scale, geography and delivery model.

Cost Pressures

Norfolk Island's electricity service is subject to higher delivery costs due to diesel reliance, freight and logistics requirements, and small system scale. The current average tariff (approximately 60 c/kWh) is broadly consistent with tariffs observed in other remote and island settings but does not provide for full lifecycle asset renewal.

External Funding

No external grant funding is currently secured for the Norfolk Island electricity service. Publicly available information indicates that some comparator jurisdictions, including Lord Howe Island and Flinders Island, have received Commonwealth and state funding support for renewable integration and system upgrades.

Service Delivery Model

Norfolk Island operates an in-house electricity service supported by limited external contracting. Comparator jurisdictions apply a range of alternative delivery arrangements, including state-owned utilities or hybrid models, which provide access to additional technical and workforce capacity. Norfolk's delivery model relies on a small local workforce, which may limit redundancy and surge capacity.

Renewable Integration

Norfolk Island has high levels of customer-owned rooftop solar and operates a battery system; however, generation dispatch remains predominantly diesel-based. Other island systems operate integrated hybrid energy systems designed to optimise renewable dispatch at a system level.

Digital Capability

Comparator utilities have implemented digital systems to support maintenance scheduling, monitoring and reporting. Norfolk Island continues to rely primarily on manual records and reactive work practices, which limits consolidated visibility and structured asset planning.

6. Asset Management

This section assesses the condition, risk profile, maintenance practices and forward capital needs of Norfolk Island's electricity infrastructure. It draws on the Electricity Asset Management Plan, the GHD Criticality Assessment (2024), DILO insights, the Operational Plan 2025-26, the Long-Term Financial Plan (LTFP) and risk registers.

Asset Overview

Electricity services are supported by a set of infrastructure that is central to generation, storage, distribution and reliability of power supply across the island. This includes:

- Six diesel generators (1 MW each; CAT and Cummins units)
- 400 kW load bank
- Tesla 2 MW battery storage system
- Low voltage switchboard and medium voltage switchgear
- Underground and overhead distribution lines (~44 km)
- Customer smart meters (rollout in progress)
- SCADA control systems (basic monitoring)

Asset Condition and Profile

The following table summarises the current state of key electricity infrastructure. It draws on the Asset Management Plan (AMP), GHD Criticality Assessment (2024) and staff inputs. The overview highlights age, condition and functionality to guide renewal priorities and forward planning

Asset	**Condition**	**Notes**
LV Switchboard	End-of-life	Identified in GHD assessment as WHS-critical due to arc flash risk
MV Switchgear	Aged, partially serviceable	Renewal staged in LTFP; identified as AMP priority
Step-up Transformers	Aged	AMP indicates replacement needed within 3-5 years
Generators	Serviceable but ageing	Long-term replacement planning required
SCADA and Controls	Basic	Functional but lacks automation or predictive capability
Distribution Network	Mixed	~50% underground; mapping and inspection coverage incomplete

Smart Meters	Nearly complete	Installed for most customers, with limited exemptions

Asset Maintenance Strategy

Electricity asset maintenance is currently managed through a reactive approach with limited formal planning or preventive activity. A documented maintenance strategy or lifecycle model has not yet been developed to set out frequency, task type or resourcing.

- Tasks are tracked on paper or whiteboards. A digital system is not yet in place to record condition, history or recurring defects
- Preventive inspections are carried out on an informal basis. A rolling calendar or defined inspection cycle has not yet been introduced
- Condition data is available but is not linked to financial triggers for renewal
- Continuity relies on experienced staff with system knowledge that is not centrally recorded
- WHS checks are undertaken manually though documentation is not always consistent

Introducing a planned preventive maintenance strategy would support longer asset life, reduce unplanned outages and strengthen safe and efficient operations.

Renewal and Investment Priorities

The AMP identifies $20-27 million in critical renewals over the next five years, including switchgear, transformers and distribution infrastructure. The Operational Plan 2025-26 allocates $4.2 million for electricity capital works, and the LTFP stages funding for priorities such as MV switchgear in 2026 and transformers in 2027.

Renewals identified in the AMP exceed current allocations. Delivery will depend on Council's financial capacity, external funding and workforce resourcing.

Planned and Required Capital Works

The table below summarises priority projects, their indicative cost, current funding status and key notes.

Asset / Project	**Estimated Cost**	**Funding Status**	**Notes**
LV Switchboard replacement	$6-8m	Allocated (Operational Plan 2025-26)	Identified in the GHD assessment as a WHS risk (arc flash hazard)
MV switchgear renewal (staged)	$5-6m	Included (LTFP 2026 - Infrastructure $3.15m)	Aged and partially serviceable; renewal staged in LTFP
Step-up transformers (x2)	$7-8m	Included (LTFP 2027 - Transformers $4.12m)	Approaching end of service life; AMP priority
Battery system expansion	$0.8-1.2m (AMP concept) / $2.0m (2 MW proposal)	Concept only - not funded	Listed as a future option in AMP. Deficit reduction opportunities note potential annual fuel savings of $250-400k (indicative)
Powerhouse roof & WHS upgrades	$0.15-0.2m	Identified (AMP/DILO) - managed operationally	Active leaks and electrical issues noted
Undergrounding critical feeders	$1.5-2.5m staged	Partially allocated (Op Plan 202-26: $1.53m)	Partial works underway in 2025-26

7. Operational Activity and Qualitative Analysis

This section provides a qualitative view of day-to-day electricity operations. It draws on Day in the Life (DILO) observations conducted in 2025.

Operations rely on manual systems, reactive maintenance and staff knowledge to sustain service delivery.

Operational Observations and Process Review

- Maintenance is reactive with no structured preventive maintenance calendar or condition-based scheduling
- Work allocation is set informally, with daily priorities communicated verbally and noted manually
- System monitoring depends on operator observation and basic SCADA inputs with no predictive alerts or diagnostics
- Maintenance backlogs are tracked manually, which may delay WHS compliance and risk mitigation
- No digital asset management or lifecycle tracking is in place, limiting future capital planning and renewal triggers

DILO Reflections and Staff Insights

- **High Workload Pressure**: Teams manage urgent repairs, inspections and customer requests with limited staff.
- **Manual Recordkeeping**: Generator logs and field reports are handwritten
- **Potential Weather-Driven WHS Risk**: Roof leaks and moisture ingress raise electrical safety challenges in operational areas which are being managed operationally.
- **Workforce Dependency**: Key knowledge resides with a few long-serving staff. There is no formal succession planning or structured training.
- **Limited Contractor Support**: Most specialist work requires off-island technical support which can result in delays and extra cost.

8. Risk and Compliance Assessment

The electricity service operates in a complex environment. Risks are documented in Council's risk registers and asset management plans. The Service Review draws on the Operational Risk Register, where risks are monitored under existing controls and reviewed quarterly through Council's corporate risk framework.

Summary of Key Risk and Compliance Areas

The table below outlines the main risks for the electricity service. It reflects information from the AMP, service records, risk registers and operational observations.

Risk Area	Description	Potential Impact	Current Status
Asset condition and ageing	LV switchboard, MV switchgear and transformers identified in AMP as nearing end-of-life	Service disruption, reduced reliability	Partial funding allocated
Workforce capacity	Small team with broad responsibilities and limited succession coverage	Reduced service continuity, resourcing strain	Covered through flexible arrangements, workforce planning in progress
Fuel cost exposure	Diesel costs are more than 75% of OPEX and sensitive to global prices	Budget volatility	Monitored through budget forecasts
Fault response capability	No automation or remote monitoring, limited SCADA and after-hours coverage	Delayed fault detection and restoration	Reactive model in place
Data and records management	Asset and maintenance data not systematised	Limited audit readiness, planning constraints	Records maintained manually, transition to digital platform planned
Operational safety (WHS)	Switching and arc flash controls managed through operational	Field safety, operational coordination	Controls in place, mitigation works

	knowledge, water ingress noted during observations		underway in line with WHS obligations
Toxic gas exposure	Diesel generators and Tesla battery installations may produce hazardous gases	Worker health risk	Ventilation and PPE in place, periodic air quality testing planned
Fire or explosion hazard in powerhouse	Flammable fuels and high-voltage equipment in confined space	Injury, asset damage	Housekeeping and emergency procedures in place, suppression system upgrade under consideration
Battery disposal and recycling compliance	Disposal of units must meet environmental regulations	Environmental harm, compliance breach	Disposal plan update scheduled, external compliance advice to be sought
SCADA system failure or obsolescence	Outdated or unsupported SCADA components	Loss of monitoring and control	System maintained, replacement flagged in AMP
Cybersecurity threats	Unauthorised access or disruption to SCADA and utility systems	Service disruption, data loss	ICT security measures in place, Essential 8 alignment underway
Customer disconnection process legal risk	Disconnection disputes or process errors	Reputational damage, legal exposure	Process under review

Compliance Obligations

The table below lists the main legislation, policies and standards that apply to the electricity service. It sets out how each obligation applies, what is expected and the current status within Council.

Compliance Obligation	Relevance to Service	Expectation	Current Status
Work Health and Safety Act (NI)	Safe work procedures, electrical risk controls, HV switching protocols	Documented safety procedures, arc flash controls and training	Operational controls in place, formal documentation in progress
Electricity Supply Act 1985 (NI)	System operation, switching authority, service reliability	Defined responsibilities, isolation protocols and service standards	Operational protocols in place, documentation to be formalised
Environmental Protection (NI)	Diesel storage, containment, spill response, battery disposal	Compliance with fuel and battery storage, handling and disposal requirements	Fuel controls in place, battery disposal plan update scheduled
NIRC Asset Management Policy	Risk-based infrastructure planning and renewal	Track condition, forecast renewals, support investment decisions	Lifecycle data managed through AMP
Recordkeeping requirements	Maintenance logs, inspection evidence and safety reporting	Maintain accurate records for audit and review	Records maintained manually, transition to digital platform planned
Internal Risk Management Framework	Risk identification, monitoring and treatment actions	Maintain risk register and monitor quarterly	Strategic and operational risks reviewed quarterly
ICT Security Standards (Essential 8)	Cyber resilience for SCADA and utility systems	Implement security controls and monitor compliance	ICT security program in place, Essential 8 implementation in progress

9. Findings

This section summarises key findings from operational review, asset assessments, staff engagement, financial analysis, and peer benchmarking. It identifies challenges, constraints and performance gaps impacting the delivery and sustainability of electricity services on Norfolk Island.

Strengths observed (what's working well)

- **Service reliability**: Uptime consistently exceeds 99.5%. Local operators respond quickly and know the system well, which helps maintain reliability despite limited automation or digital diagnostics
- **Community renewable uptake**: More than 530 rooftop solar systems and over 200 batteries are in use, showing strong customer participation in local energy reform
- **Diesel displacement**: In Q4 2024 solar and batteries displaced more than 150,000 litres of diesel, lowering both emissions and fuel dependence
- **Workforce commitment**: Staff show strong ownership, adaptability and multitasking under resourcing constraints. Their commitment sustains service levels and community confidence
- **Asset management framework**: Electricity is treated as a core asset class with an AMP that identifies asset condition, renewal priorities and long-term capital needs. This provides a structured basis for forward planning and advocacy

Challenges Identified

The electricity service on Norfolk Island faces a series of structural, operational and financial challenges that constrain its performance, resilience, and future sustainability:

- **Aging Infrastructure and Safety Hazards** - Key assets including the LV switchboard, MV switchgear, and step-up transformers are at or near end-of-life, with known safety risks and compliance limitations. These issues are documented in both the AMP and GHD condition assessments.
- **Reactive Maintenance Model** - Maintenance is mainly reactive with no preventive calendar or formal condition-based triggers. This can lead to unplanned downtime, makes forward planning more difficult and may shorten asset life
- **Manual Systems and Limited Digital Capability -** There is no CMMS, digital asset register, or mobile-enabled job tracking. SCADA functionality is basic, lacking predictive diagnostics. Handwritten logs and whiteboard scheduling reduce reporting accuracy.

- **Workforce Constraints** - With only five FTEs managing all generation and distribution operations, there is limited redundancy, no surge capacity, and significant dependency on long-serving staff. Succession planning, knowledge capture and mentoring are not formalised.
- **Recruitment and Contractor Reliance** - The service has experienced recruitment challenges for qualified linesmen, consistent with Australian shortages in this field. Council continues to explore recruitment strategies, training and external support option. Most specialist work requires off-island contractors which adds delays and cost.
- **Funding Constraints and Capital Delivery Gap** - The AMP identifies $20-27 million in required renewals over the next five years with $4.2 million is allocated in FY2025–26.
- **Cost Recovery Pressure** - The cost to deliver electricity exceeds the retail tariff (~60c/kWh), contributing to a forecast full-service deficit of $1.7 million annually. Current pricing does not account for infrastructure renewal, digital system upgrades or strategic improvements.
- **Diesel Cost Volatility** - Diesel accounts for over 75% of operating costs, with approximately 1.5 million litres consumed annually. Price fluctuations significantly affect budget stability, with a 20c/L increase adding ~$300,000 in annual cost.

10. Opportunities

This section outlines strategic opportunities and recommended actions to improve the sustainability, efficiency and resilience of the electricity service. Opportunities are grouped into three categories:

- Deficit Reduction Opportunities– Directly target the approx. $2 million operational shortfall.
- Service Capability Enhancements – Improve capability, compliance and delivery performance.
- Transformational Opportunities – Require funding or delivery reform but offer step-change potential.

All opportunities and cost estimates are preliminary and subject to detailed business cases, market testing, funding confirmation and Council endorsement. Potential benefits are indicative only and depend on uptake, operating conditions and implementation sequencing.

Deficit Reduction Opportunities

The table below summarises recommended actions that could reduce the operating deficit, currently estimated at $2 million per year. These initiatives have the potential to deliver $550k–$950k in indicative annual savings.

The following initiatives have been identified as having the most direct potential to reduce the structural operating deficit over the next 1–3 years. Savings are indicative only and depend on implementation, sequencing and external funding.

Estimates are preliminary. Initiatives can be paired where appropriate to improve efficiency and return.

Opportunity	Description	Estimated Cost	Indicative Benefit	Notes
Battery system expansion	Install a second 2 MW battery to offset diesel use	$2.0m capital	$250k-$400k per year	AMP priority, may be grant-eligible
Digital maintenance system (CMMS)	Implement CMMS for work and asset management	$50k + $10k/year	$75k-$125k per year	Supports proactive scheduling and audit readiness

12-month maintenance planner	Introduce planned maintenance calendar	$0-$30k	$50k-$80k per year	Improves crew efficiency and fault prevention
Outsource preventive maintenance	Use standing contracts for scheduled HV testing and servicing	$30k-$50k/year	$75k-$100k per year	Frees internal capacity for other work
Standing service contracts	Replace one-off callouts with annual service contracts	Minimal	$50k+ per year	Reduces callout rates, includes SCADA tuning and cybersecurity reviews
Overtime and contractor reduction	Rationalise casuals, allowances and overtime	Internal	$50k-$100k per year	Works best when combined with CMMS and planner

Basis for Savings Estimates

The savings ranges shown in the Deficit Reduction Opportunities table are indicative and derived from FY2025–26 budget data, operational observations, and peer utility benchmarks. Calculations follow these principles:

- **Battery Savings** – Modelled using current diesel consumption (1.5M L/year), expected displacement from additional battery capacity (10–16%) and average diesel cost ($1.65-$1.70/L).
- **Digital Maintenance System & Planner** - Based on 5-8% overtime reduction and improved resource utilisation, applied to the $272k overtime/contractor/casual budget.
- **Outsourced Preventive Maintenance** - Estimated at 20-30% savings compared to ad hoc contractor rates for HV testing and servicing.
- **Standing Service Contracts** - Savings from replacing reactive callouts with annual contracted rates.
- **Overtime & Contractor Reduction** – Targeted savings achievable through better rostering and scheduling.

Key Assumptions:

- Diesel price volatility will affect fuel-related savings.
- Year 1 savings may be reduced due to implementation/setup time.

- Some savings overlap (e.g., CMMS and planner both reduce overtime) and should not be summed without adjustment.
- Figures are for strategic planning and require validation through detailed business cases.

Service Capability Enhancement Opportunities

The table below outlines internal opportunities to strengthen capability, structure and governance. They address challenges such as reactive work and workforce constraints. While they do not directly reduce the operating deficit, these actions are important for enabling future efficiencies, supporting grant readiness and maintaining long-term stewardship of electricity assets.

Initiative	Description	Estimated Cost	Estimated Timeframe	Notes
Transition to an asset-led operating model	Separate day-to-day operations from planning, compliance and asset management	Internal restructure or 0.5-1.0 FTE	6-12 months	Improves visibility, scheduling and accountability
Formalise easements	Complete legal access arrangements for assets on private land	$50,000	6-12 months	Supports safe access and maintenance
Develop workforce capability and succession plan	Implement mentoring, training and succession strategies with focus on HV switching and operational skills retention	Internal or $20,000-$40,000	6-12 months	Addresses workforce capacity and continuity risk
KPI and reporting framework	Develop measurable indicators for renewal, WHS, efficiency and service delivery	Internal	3-6 months	Supports governance and compliance
Compliance calendar and dashboard	Track regulatory and internal obligations	Internal	3 months	Reduces risk of compliance lapses
Continuous improvement program	Capture, act on and track process refinements	Internal	Ongoing	Builds a proactive improvement culture
SCADA upgrade and cybersecurity alignment	Upgrade SCADA components and align with Essential 8 controls	To be costed	12-24 months	Addresses SCADA obsolescence and cyber risks

11. Transformational Opportunities

The following opportunities represent a strategic pivot away from legacy energy challenges like diesel dependence, limited scale and internal delivery strain, toward a modern, resilient electricity system. While the opportunities require external funding, structural change or cross-sector collaboration, they hold the potential to redefine how power is generated, manage and paid for on Norfolk Island over the next decade. The table below includes estimated financial impacts, peer council references, and alignment with broader infrastructure and climate goals. All figures are indicative and subject to detailed design, funding confirmation and Council endorsement.

Initiative	**Description**	**Estimated Cost**	**Peer Councils Implementing**	**Indicative Benefit ($)**	**Strategic Advantages**
Microgrid-as-a-Service (MGaaS)	Partner with a private firm to fund, own and operate solar + battery infrastructure via a long-term service agreement	No capital cost (service model)	Lord Howe Island, Flinders Island	Avoided capital and opex	Enables rapid renewable deployment without upfront funding or borrowing
Promote electric vehicle (EV) uptake	Accelerate community and fleet EV adoption through education, incentives and local policy alignment. Encourage daytime charging to maximise solar use and reduce evening peak demand	$20k–$50k (pilot)	King Island, Alice Springs	$1,000+/EV/year	Builds demand, supports solar utilisation, aligns with Australian climate transition goals
Install public EV charging stations	Install 1–2 public charging stations for residents and tourists	$15k–$30k per charger	Flinders Island, Byron Shire	$500–$2,000/year	Visible climate commitment, supports tourism
Visitor energy contribution (proposed $10)	Introduce an optional or opt-out visitor contribution via accommodation providers to support renewable upgrades	Minimal setup	Lord Howe Island (sustainability fund)	$150k–$200k/year	Aligns tourism with energy costs, creates local funding stream

Grant and Co-Funding Opportunities for Electricity Services

The table below summarises key grant programs that Norfolk Island Regional Council may be eligible for based on its remote location, diesel reliance and need for electricity infrastructure upgrades. These grants may offer support for battery expansion, microgrid transition, AMP implementation and renewable energy initiatives.

Program	Administered by	Purpose / Focus	Approx. Funding Range	Peer Councils	Relevance to Norfolk Island
ARENA – Remote and Regional Microgrids	Australian Renewable Energy Agency (ARENA)	Support for solar + battery microgrids, diesel offset and remote resilience	$1m–$15m	Lord Howe Island, Flinders Island	Strong alignment with battery expansion, MGaaS models and diesel reduction goals
CEIG – Community Energy Investment Grants	Federal and State collaboration	Co-investment in renewable infrastructure with community or council partners	$250k–$5m	Flinders Island, King Island	Could fund EV infrastructure, public battery projects or solar system upgrades
LRCI – Local Roads and Community Infrastructure Program	Department of Infrastructure (Federal)	Funding for community-facing infrastructure including energy projects	Up to $2m per round (stream-dependent)	All Australian LGAs including remote islands	May support EV charging, generator shed renewal, public safety upgrades or hybrid backup enclosures
CEFC – Clean Energy Innovation Fund	Clean Energy Finance Corporation (CEFC)	Debt or equity support for councils and partners trialling innovative renewable solutions	$500k+ (no fixed cap)	Byron Shire, Alice Springs	May support MGaaS, solar–battery–EV integration or circular energy trials

12. Recommendations

This review has identified short, medium and long-term opportunities to improve cost recovery, operational performance and the future resilience of electricity services on Norfolk Island.

The following actions are suggested to improve cost recovery, strengthen operational performance and support the long-term resilience of electricity services on Norfolk Island. They are indicative and subject to detailed design, due diligence, funding availability, stakeholder engagement (where applicable) and Council approval.

Phase 1 – Immediate (0–12 months)

Develop a business case and funding application for a second 2 MW Tesla battery, including lifecycle management and future disposal of solar and battery assets.

- Establish a planned maintenance schedule and integrate assets into a CMMS.
- Finalise network access and secure easements.
- Upgrade SCADA software replacement following management changes and tariff review.

Phase 2 – Medium Term (12–36 months)

- Implement workforce continuity measures including succession planning and targeted recruitment.
- Transition to an asset-led operating model that separates daily operations from planning and compliance.
- Develop a KPI and reporting framework to track renewal progress, WHS compliance and service efficiency.
- Establish a compliance calendar and dashboard to monitor statutory and internal obligations.
- Outsource high-voltage preventive maintenance using standing service contracts to free internal capacity and reduce callout costs.
- Deliver compliance-driven capital works such as switchgear and feeder renewals.

Phase 3 – Long Term (3–5 years)

- Explore Microgrid-as-a-Service delivery models.
- Support electric vehicle uptake with public daytime charging.
- Assess feasibility of a visitor energy contribution model in partnership with accommodation and tourism stakeholders
- Explore a grant pipeline for staged AMP renewals.

Funding-Dependent Focus

If external funding is not secured, priority should be given to works that address the highest safety, compliance and service continuity risks based on current asset condition.

Implementation and Monitoring

Implementation should be sequenced according to available funding, resources and Council priorities with progress tracked through established reporting and governance processes.

13. Appendix

Acronyms

The following table lists acronyms used in this service review.

Acronym	Full Term	Description / Context
AMP	Asset Management Plan	Long-term infrastructure plan outlining asset condition, renewal priorities, and funding
CAPEX	Capital Expenditure	Funds used to acquire or upgrade physical assets such as generators or battery systems
CEFC	Clean Energy Finance Corporation	Federal body providing finance for clean energy projects
CEIG	Community Energy Investment Grants	Grant program for community-scale renewable energy infrastructure
DILO	Day in the Life	Operational observation method used to understand real-time staff workflow and constraints
DRF	Disaster Recovery Funding	Funding framework to support rebuilding and resilience of infrastructure after disruption
EV	Electric Vehicle	Vehicles powered by electricity; used to support solar charging and grid demand
FTE	Full-Time Equivalent	Standardised unit to measure staffing levels
KPI	Key Performance Indicator	Metrics used to track service, safety, or asset management performance
LRCI	Local Roads and Community Infrastructure	Federal program funding local infrastructure, including energy or EV charging
LTFP	Long-Term Financial Plan	Forecast model of Council income and expenditure over a 10-year period
MGaaS	Microgrid-as-a-Service	Third-party model where a provider funds, builds, and operates energy infrastructure
NIRC	Norfolk Island Regional Council	Local government authority responsible for electricity and other services

OPEX	Operating Expenditure	Day-to-day recurring costs of running the electricity service
PV	Photovoltaic	Technology used in solar power generation
SCADA	Supervisory Control and Data Acquisition	System that provides control and monitoring of the electricity network
WHS	Work Health and Safety	Legislative and procedural framework for workplace safety and risk management

Reference Documents

The following documents were reviewed and referenced in the preparation of this Service Review. This list is not exhaustive and other operational, financial, compliance and technical sources as well as other internal records, discussions with staff may have been consulted to inform the analysis and findings.

- Day-in-the-Life (DILO) Observations
    - Section Leader DILO – Electricity
    - Section Leader DILO – Powerhouse
- Electricity Daily Diary (May 2025)
- Electricity Asset Management Plan (2021, adopted version)
- Electricity Service Statement
- Federal Grant Program Guidelines (ARENA, CEIG, LRCI, DRF, CEFC)
- GHD Asset Condition Assessment (2021)
- Long-Term Financial Plan 2020-2029
- NIRC Operational Plan 2025-26
- NIRC Service Review Framework