Towards Net Zero Magnetic Island (Yunbenun) Climate Action for Business

Biz Assist Waste & Energy Recommendations Report

1. Executive Summary

Purpose

The Biz Assist project was developed to support Magnetic Island (MI) businesses in reducing both waste and energy impacts through practical advice, data-driven insights, and targeted recommendations. Over an 18-month period, MICDA's Waste & Energy Advisors engaged with local businesses across key sectors, conducting one-on-one consultations and collecting operational data. This engagement captured both waste management and energy use practices across diverse business types — including hospitality, retail, tourism, and community centres. It aims to build the capacity of Magnetic Island businesses to take measurable action on waste and energy.

Key Findings

The project worked with MI business and achieved significant progress in:

- Waste reduction and diversion, particularly in packaging, organics, and recycling streams.
- Energy efficiency improvements, including equipment upgrades, behaviour change, and renewable energy uptake.
- Collective GHG emission reductions, contributing to the island's sustainability targets.

Next Steps

Over the next 3–5 years, recommendations will focus on:

- Implementing the 58 recommendations in the Towards Zero Waste Strategy 2025-2030. Key recommendations that apply to businesses are:
    1. Townsville City Council (TCC) adopt a Single Use Packaging and Materials Policy to ban specified single use items.
    2. TCC planning & building approvals include mandatory conditions around short and long term waste reduction and recycling materials.
    3. TCC includes the hospitality sector in any food waste collection service as either an extension to the household Food Organic (FO) / Food Organic and Garden Organic (FOGO) service or as a dedicated collection program.
    4. A Glass Recycling Feasibility Study be conducted to investigate options to process and reuse glass on the island.

5. TCC provides free solar panel recycling on MI and provides free metal collections for scrap for businesses on MI.
6. Businesses should not be charged for disposing recyclable goods like metal etc at the tip but should be fined if recyclables are found in general waste, including the commercial skip bins.
7. Consult with major accommodation providers, booking agencies and commercial cleaning contractors to determine the most appropriate waste bins to encourage separation of waste and recycling at the point of generation.
8. Investigate whether a bulk order of standardised bin types would assist with implementation.
9. Consult about the type of supporting information and resources – bin stickers, fridge magnet, compendium leaflets flyers etc and design educational resources with graphics to reduce language barrier.
10. Distribute resources and bin stickers and encourage all venues to use a consistent approach.

- Having more businesses adopt energy reduction and efficiency strategies, and/or powered by renewable energy including battery storage. Over the next 3–5 years, implementation should prioritise structured engagement, financing support, and targeted data collection to accelerate business adoption. Key recommended actions:

    1. Establish a program or business offering on-island technical assessments, design reviews, and implementation support for solar PV, battery storage, and high-efficiency appliances.
    2. Create a fund or work with state and federal programs to provide low-interest loans or rebates for priority upgrades (lighting, HVAC, refrigeration).
    3. Adopt a collective procurement model— coordinate bulk purchasing of solar PV, batteries, and efficiency retrofits to achieve significant cost savings and reduce logistical barriers.
    4. Develop a network through local training and partnership with island-based apprentices to improve service reliability and reduce mobilisation costs.
    5. Monitor and publish annual progress data, including total renewable capacity installed, MWh saved, and tonnes CO_2-e reduced, to maintain accountability and visibility of impact.

- Supporting circular economy initiatives and stakeholder/local collaboration. Leveraging data insights to guide future community sustainability actions. To sustain continuous improvement, decision-making should be evidence-based and community-driven. Recommended mechanisms:

    1. Establish a data hub — integrating energy and water data from participating businesses into a live or annual reporting platform.
    2. Expand energy-use monitoring — deploy smart meters or internet connected sensors in commercial and residential sites to better understand Magnetic Island's load and emissions profile.

3. Publish open-access dashboards, translating technical data into accessible community insights.

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2. Background

Project Overview

Magnetic Island Community Development Association (MICDA) was funded in early 2024 by the partnership between the Australian Government's Reef Trust and the Great Barrier Reef Foundation for a Community Climate Action Grant called Towards Net Zero Magnetic Island (Yunbenun).

The goal of this grant was to accelerate community climate action projects for Magnetic Island, which in turn creates climate change action for the World Heritage listed Great Barrier Reef. In October 2025, the project was completed. Two part time Business Advisors worked with stakeholders including Townsville Council, Tourism Magnetic Island, Plastic Free NQ (Boomerang Alliance) and the community-based working groups Totally Renewable Magnetic (TRM) and Zero Waste Magnetic Island.

The Business Advisors roles included:

- Helping island businesses adopt waste reduction strategies, reduce their energy use and move to becoming 100% renewable energy powered.
- Improving the capacity of businesses to reduce their carbon emissions.
- Collecting accurate, on-the-ground data to inform individual business and wider business /community-wide sustainability planning.
- Foster long-term capability and behavioural change within the MI business community.

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3. Methodology

Business Engagement

One-on-one consultations with Magnetic Island businesses over an 18-month period. Businesses were visited in person and invited to participate in the project. Other business engagement efforts included:

- Business Advisors attended 3 Tourism Magnetic Island regular meetings;
- Business advisors joined in the Zero Waste Strategy Focus Groups for Business and the Energy Forums;
- The "Adopt-a-business" presentation at the Composting Workshop in May 2025
- Promotion of sustainable initiatives from local businesses, with focus on waste reduction and other sustainability actions, via social media posts, posters at

community engagement stalls and events, advertisement on Magnetic Island Guide and series of promotional videos; and
- Data collected on waste types, energy use, and sustainability practices.

Data collection via interviews and questionnaires were utilised to guide each business advisor's first engagement or visit to the relevant business. The primary engagement focussed on collecting information about general sustainability efforts, waste management, energy assessments, quantitative and qualitative information about waste generation and disposal and any specific energy consumption patterns by their operations. The business operations and premises were inspected as per business owners or the managers discretion, and observations were noted / photographed for reporting purposes. Reports on the business in terms of energy or waste business recommendations were compiled and provided to the relevant business. Otherwise, the business advisors worked with those businesses on specific energy or waste reductions actions and strategies that did not warrant a full report.

Data Management and Confidentiality

- All individual business data and identities remain strictly confidential.
- This report contains only aggregated, de-identified results.
- Confidential individual reports are provided to the relevant businesses and GBRF (not for public release).

Review Process

Draft findings and recommendations to be reviewed by participating businesses and key stakeholders before finalisation.

4. Findings and Recommendations

COMPONENT 1: WASTE

4.1 Waste Data Overview

Participation: 52 businesses consulted; 34 businesses participated in proposed waste reduction initiatives; 14 businesses' waste assessed.

Average waste generation: n=14

General waste (including food waste):	13.84	tonnes/year/business
Co-mingled recycling:	12.71	tonnes/year/business

Summary of Greenhouse Gas (GHG) emissions saved and potential to save if recommendations adopted:

Waste diversion from landfill:

Potential: 19.25t waste/year - GHG emissions savings: 48.52t CO_2-e/year
Realised: 0.602t waste/year - GHG emissions saved: 2.15t CO_2-e

Waste reduction:

Potential: 2.71t waste/year - GHG emissions savings: 5.734t CO_2-e/year

The calculations here are conservative, only taking into account scope 3 emissions resulting from the waste's decomposition in landfill. If other factors were considered, e.g. emissions arising from transportation to landfill, the values could be considerably higher.

Reference for calculation: "Australian National Greenhouse Accounts Factors" published by DCCEW, 2024.

Waste types	**Scope 3 emission factor (t CO_2-e/t)**
Food	2.1
Paper and cardboard	3.3
Garden and green	1.6
Wood	0.7
Textiles	2.0
Sludge	0.4
Nappies	2.0
Rubber and leather	3.3
Inert waste (including concrete/metal/plastics/glass)	/
Municipal solid waste	1.6

Formula: t CO_2-e = Q x EF

t CO_2-e is the emissions measured in CO_2-e tonnes
Q is the quantity of waste measured in tonnes

EF is the emission factor of waste type as per table above

Reference used for calculation of GHG emissions from plastics:
“Climate Impact of Plastic Consumption in Australia - Summary Report”, Blue Environment, AMCS,WWF-Australia- 2023

Main waste streams: single use packaging, food waste, organics (non-food waste) and mixed recyclables. Some businesses with low overall waste generation generate considerable amounts of specific waste items, such as:

- Single-use drink containers
- Wetsuits
- Blister packs
- Soft plastics from packaging
- Hard plastic containers (buckets, plant pots)
- Steel drums

Key recommendations made and findings: There was a high potential for diversion of waste from landfill through improved separation, reuse systems, specialist recycling programs and composting initiatives. Specialist recycling programs were readily adopted or considered by relevant businesses when prompted and arranged by the waste business advisor, demonstrating that many island businesses feel a level of responsibility for waste that is unique to their operations. Examples: pharmaceuticals recycling program, fishing gear recycling program. Wider initiatives with involvement of collective businesses and no upfront costs were also well accepted, demonstrating willingness to contribute to a reduction of waste generation on the island and environment protection. Example: BYO Friendly Places program - supporting customers presenting reusable containers (8 hospitality businesses participating).

Some resistance was noticed from certain business owners towards initiatives that aim to reduce more common and abundant waste types such as food waste and single-use packaging destined to landfill. Examples of issues provided by business owners or managers:

Diverting food waste to a compost system

- Operational changes in food preparation area deemed too complex or not feasible
- High staff turnover requiring constant staff training
- Dependability of collection of food scraps from third parties if compost system is off-site

Reduction / Elimination of single-use food and drink containers

- Customer demand for take-away options
- Lack of available washing facilities

- Belief that their choice of containers will be recycled or composted therefore not detrimental to the environment

Introduction of recycling/ 10 ¢ containers bins to recover recyclables from landfill

- Cost-benefit concerns (unsure if effective due to high level contamination observed past experiences)
- Containers Refund Scheme bins - frustration with current collection systems (not reliable)
- Cost of introducing recycling bins inside every room (accommodation venues)

4.2 Waste Opportunities Identified

- Specialist recycling programs are available for uptake by specific businesses such as battery recycling but there are logistics and/or cost barriers for smaller businesses.
- Reduction of food waste from breakfast buffet by adopting industry-led initiatives suggested
- Implementation of containers refund scheme collection and donation of funds to staff to incentivise recovery of containers from rooms by housekeeping (that otherwise would go to landfill)
- Implementation of small recycling bins in rooms/units to recover recyclable items going to landfill
- Food waste diversion from general waste to a composting system – on-site or off-site (by partnering with community members who would collect food scraps)
- Egg shells diversion from waste by donation to experimental recycling program
- Reduction of paper waste/ink consumption by implementing paperless check-in and digital welcome letters by QR code
- Replacement of toiletries in sachets/small individual containers with refillable containers in units/hotel rooms
- Implementation of recycling bins and 10 ¢ container bins in public areas of accommodation businesses to divert recyclable items from landfill
- Signage for accommodation businesses to educate guests about recycling to improve recovery from landfill
- Creation of Sustainability Policy for accommodation provider in order to comply with specific green label
- Training of housekeeping staff to recover recyclables from general waste bins

4.3 Recommendations

Policy & Strategic (3–5 years):

- Implement MICDA's Towards Zero Waste strategy with business participation targets.
- Pilot shared collection or drop-off systems for specific waste streams (e.g. glass, soft plastics).
- Promote a community reuse marketplace and repair culture.
- Improve general awareness about how the effects of climate change can affect tourism on Magnetic Island.

- Improve businesses' awareness about strategic markets that are aligned with eco-tourism and sustainability efforts to stimulate change.
- Pursue state and local policies that ban or restrict the use of single-use plastic.
- Pursue government policies that provide businesses with financial incentives for improving diversion rates of recyclables from landfill.

Business-Level (Practical):

- Improve source separation and signage.
- Switch to reusables or compostables where possible.
- Track waste volumes to monitor ongoing improvement.
- Education and information for business, staff and consumers.
- Continued promotion of sustainable initiatives from local businesses.
- Facilitation of industry-led workshops assisting businesses to adopt new protocols (e.g. Food Organic and Green Organic council collection)

COMPONENT 2: ENERGY

Participation: 83 Businesses consulted; 42 Energy bills collected; 11 Interval meter datasets analysed. Coverage spans hospitality, transport, accommodation, restaurant, retail, sole trader, First Nations, and community services on Magnetic Island.

4.4 Energy Data Review (Electricity Consumption)

Annual consumption from 43 businesses (42 grid connected and 1 off-grid) is aggregated from bills of collected data. Monthly figures are shown as annual ÷ 12 for interpretability.

Annual total grid consumption of dataset:	3,917,769	kWh/yr
Annual mean consumption (per business):	47,170	kWh/yr
Annual minimum (per business):	13,348	kWh/yr
Annual maximum (per business):	1,843,000	kWh/yr
Monthly mean (per business):	3,931	kWh/month
Monthly minimum (per business):	1,112	kWh/month
Monthly maximum (per business):	153,583	kWh/month

The wide spread between minimum and maximum reflects sectoral diversity and operational intensity (e.g., small retail vs. large accommodation sites). The monthly mean provides the most comparable benchmark for routine reporting.

4.5 Energy Opportunities Identified

GHG Emissions — Identified Emissions vs Realised Abatement (tonnes CO_2-e per annum)

> *Potential CO_2e Identified for Emissions Reduction est. (tonnes)*
> *Actual CO_2e Emissions Savings est. (tonnes per annum) assumed at 0.71kg CO_2-e/yr / kwh*

Potential (Identified)

> n: 37
> Total: 1,489.85 t CO_2-e/yr
> Mean (per business with data): 41.30 t CO_2-e/yr
> Median (per business with data): 10.63 t CO_2-e/yr
> Minimum / Maximum: 0.20 – 259.15 t CO_2-e/yr

Actual (Realised)

> n: 6
> Total: 348.84 t CO_2-e/yr
> Mean (per business with data): 58.14 t CO_2-e/yr
> Median (per business with data): 7.59 t CO_2-e/yr
> Minimum / Maximum: 4.15 – 259.15 t CO_2-e/yr

Comparative Performance

> n: 43
> % Realised (Actual ÷ Potential): 23.46 %
> $ per t CO_2-e reduced (overall): $567.70 / t
> $ per t CO_2-e reduced (mean-of-ratios): $549.15 / t

Approximately one quarter of identified abatement has been realised to date. Actual results are concentrated in a small set of implementations (six sites), including one large project driving the upper bound. This is likely due to island contexts where installation logistics, age, and capital access shape the pace of delivery. Nonetheless, the realised abatement of ~349 t CO_2-e per annum equates to approximately 490 MWh of grid energy offset under current emission factors. At an average cost-effectiveness of $568 per t CO_2-e, implemented measures remain competitive with Queensland commercial energy-efficiency benchmarks ($400 and $900 per t CO_2-e).

4.6 Recommendations

Policy & Strategic (3–5 years):

- Support businesses to continue to adopt energy efficiencies, provide advice & support for businesses and business building owners/tenants around solar and/or battery installations.
- Targeted upgrades — especially lighting, HVAC, and PV + BESS integration — are achieving tangible emissions reductions within Magnetic Island's business community.
- Continued support and aggregated procurement could elevate realised abatement toward the full identified potential of ~1,490 t CO_2-e per year.
- Provide advice and support around grants, or financial incentives supporting energy efficiencies and business solar and battery adoption.
- Continue to collect and collate data and integrate business-level findings into TRM's work with residents and the island community.

Business-Level (Practical):

- Request a smart meter upgrade; Conduct regular energy performance assessments.
- Replace high-consumption equipment with more efficient models.
- Implement simple behavioural changes — switching off, demand management.
- Explore solar PV options suited to site and budget. Choose a battery storage device for grid resilience and further energy savings.

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5. Summary of Key Insights

Waste Summary

- Businesses show some willingness to engage in waste reduction if local infrastructure and support exist, but education and information alone is not sufficient.
- Major gains more likely with financial incentives, policy change which requires waste reduction to be mandatory together with education and information to advocate and support behaviour change.
- Waste reduction activities suggestions are more effective when aligned with customer demands and expectations.

Energy Summary

Across sectors, interest in solar PV, battery storage, and equipment upgrades was consistently high. However, financial and technical barriers remain the principal constraints:

- Capital cost and financing — Upfront expenditure for PV, battery, and HVAC replacements exceeds available small-business liquidity. Power Purchase Agreements (PPA) often require a 10-year contract which exceeds small-business time horizons. Bank loans and green loans are available but not often sought.
- Technical and logistical constraints — Geographic isolation limits contractor availability, inflates installation costs, and impacts delivery schedules.

- Knowledge gaps — Many operators lack access to detailed energy data. Basic meters make interpretation difficult for comparative performance benchmarks.
- Split incentives — In leased premises, owner-tenant dynamics slow decisions on major infrastructure upgrades.

These factors collectively explain why only 23.46 % of identified emissions-reduction potential has been realised to date, despite widespread willingness among participants. The relatively small scale of individual Magnetic Island enterprises presents a challenge but also an opportunity: collective procurement and shared service models (e.g., bulk PV installation, group battery storage, or energy-efficiency retrofitting programs) can dramatically lower per-unit costs. Precedent from Queensland's SME efficiency programs indicates that pooled purchasing can reduce capital costs by 15 – 25% and improve implementation rates by over 40%. When extrapolated to the island context, these savings could lift realised abatement from 23% to above 50% within three years, effectively doubling annual emissions reductions.

At an average cost-effectiveness of $568 per t CO_2-e, Magnetic Island's implemented measures are squarely within the Queensland commercial energy-efficiency benchmark range of $400–$900 per t CO_2-e. This confirms that the program's outcomes are not only technically credible but cost-competitive at a State level, despite island-specific logistical costs.

Magnetic Island businesses are poised for a rapid transition toward low-carbon operations. Despite structural challenges, the data show measurable progress: nearly 350 t CO_2-e abated annually at competitive cost, representing a meaningful step toward the island's sustainability targets. With structured support for financing, aggregation, and knowledge-sharing, the remaining ~1,100 t CO_2-e potential can realistically be captured — enabling Magnetic Island to serve as a replicable model for small-community energy transition in Queensland.

These results align with the objectives of:

- Queensland's Energy and Jobs Plan (2030 target for 70% renewable electricity)
- The Manufacturing Sustainability Benchmark Program, promoting best-practice efficiency)
- Local TRM initiatives integrating business and residential energy resilience.

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6. Conclusion

The Biz Assist Waste & Energy project has demonstrated measurable potential for improved sustainability outcomes across Magnetic Island's business community. The advisors have made real connections with the majority of island businesses, with trust, local knowledge and familiarity established with these business owners. There has been a compelling impetus created to continue the hard gains and relationships established by this project.

With 18 months of engagement and data collection, the results provide a foundation for this project to be funded for another 3 to 5 years to build and continue with:-

- Ongoing collaboration between MICDA, businesses, and the community.
- Tangible waste diversion and emission reduction.
- A pathway towards the Island's 2030 zero-waste and renewable energy goals.

MICDA reaffirms its commitment to supporting and working with local businesses as key partners in Magnetic Island's sustainability transition.