ARUP

Decarbonisation of the Great Barrier Reef Islands Whole of Island Community Pilot

Masig Island

Technical Appendix 2: Options Report

Prepared for the Queensland Department of Environment and Science & EarthCheck

December 2020

arup.com

Contents

ARUP

For further information, please contact:

Kellie Charlesworth | Associate
Ian Hustwick | Senior Consultant
Susie Mills | Senior Economist

Level 4, 108 Wickham Street
Fortitude Valley, QLD 4006
GPO Box 685 Brisbane QLD 4001

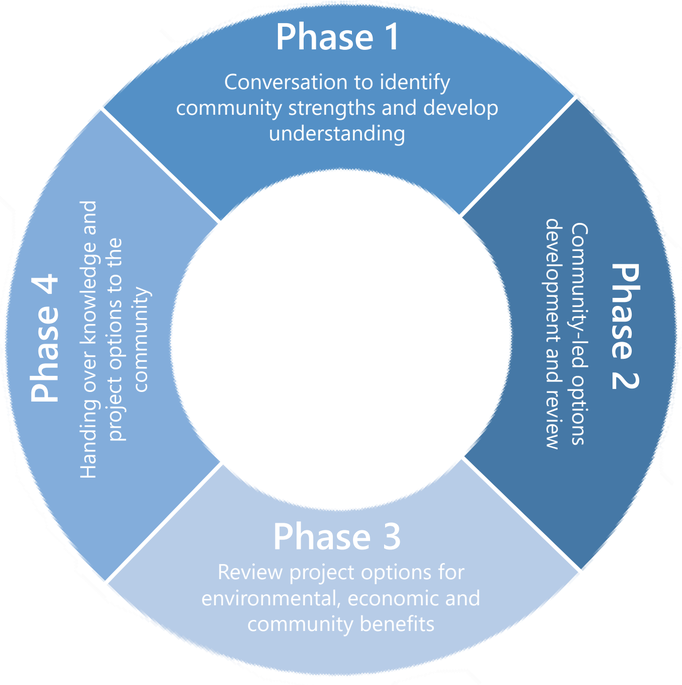
t +61 7 3023 6000

arup.com

Executive summary

Arup have partnered with EarthCheck, Queensland Tourism Industry Council (QTIC) and Regional Economic Solutions (RES) to assist the Department of Environment and Science (DES) to identify genuine decarbonisation and resilience (i.e. self-sufficiency) opportunities as part of Whole of Island Community Pilot for Masig Island. These project objectives are in alignment and support of the wider Queensland Climate Change Response (2017).

The project is comprised of four distinct phases. This interim report focuses on Phase 2: Dreaming Big- Options shortlisting, specifically the methodology employed to arrive at a shortlist of options to take to Phase 3: Which way now? – Final Project Option development.



PHASE 2 - OPTION ASSESSMENT APPROACH

A longlist of (45) options was developed for Masig Island through a process of community consultation and engagement with stakeholder organisations (Project Phase 1). This process was led by EarthCheck, with support from the project team.

The longlist options were appraised through the options assessment process (Project Phase 2), which was led by Arup with input from the wider project team. The options assessment has been informed by community and stakeholder consultations, technical workshops, desktop review and the Sustainability Assessment.

The intent of the Phase 2 assessment was to arrive at a shortlist of credible, community and stakeholder-led options to reduce carbon emissions and promote island community resilience (self-sufficiency), in line with the project objectives.

Shortlisted options were required to be considered achievable for implementation within the next 5-10 years and to perform well against a weighted set of social, economic and environmental criteria (multi-criteria assessment).

PHASE 2 - OUTCOMES AND NEXT STEPS

The final shortlisted options (17 for Masig Island) progress to Phase 3 – final project option development phase.

Options that did not progress to Phase 3 will be recorded in the final report prepared by EarthCheck.

ARUP

1.0 Project overview

1.0 Project overview

1.1 SCOPE

Arup have partnered with EarthCheck, Regional Economic Solutions (RES) and Queensland Tourism Industry Council (QTIC) to assist the Department of Environment and Science (DES) to identify genuine decarbonisation and resilience (i.e. the promotion of self-sufficiency) opportunities as part of Whole of Island Community Pilot for Masig Island.

The project is comprised of four distinct phases. This interim report focuses on Phase 2: Dreaming Big – Options shortlisting.

Community and stakeholder engagement was led by Earthcheck and RES for each of the four phases, and consisted of both in-person engagement on-island, community operations group meetings and individual phone and videoconference conversations with stakeholders.

1.2 PROJECT PHASES

The project can be divided into four phases of engagement and works. These are:

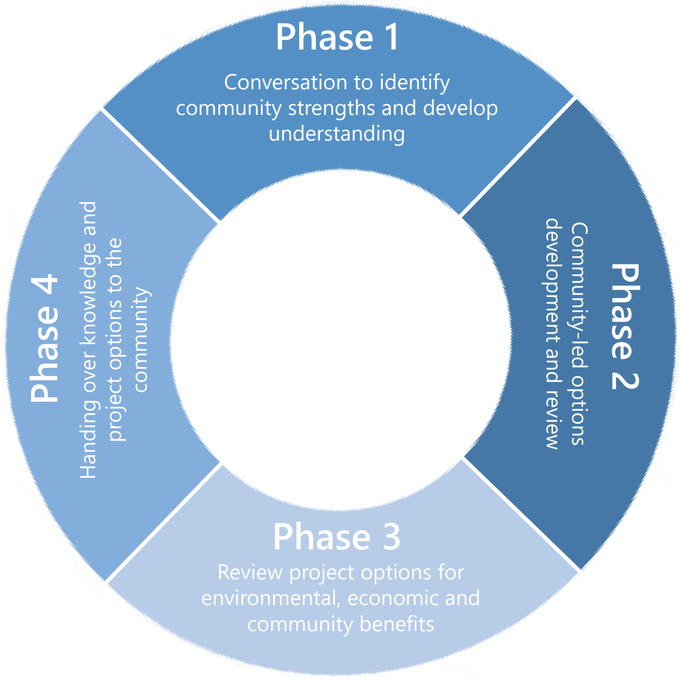
Phase 1: Sustainability assessment and option longlist

Phase 2: Option shortlisting *(focus of this report)*

Phase 3: Final project option development

Phase 4: Final project option handover to community

The diagram to the right presents the overarching project phases. The approach underpinning the options assessment (Phase 2) is subsequently discussed in detail in this report.



1.0 Project overview *cont.*

ARUP

Phase 1: The first phase of work involved community and stakeholder consultation, data gathering and the development of Sustainability Assessment Reports, a process led by EarthCheck. This process resulted in a longlist of options sourced from the community and key stakeholders supplemented with input from the project team where appropriate. Options were categorised according to theme:

1. Energy (Generation & Efficiency)
2. Water
3. Waste
4. Transport
5. Resilience

Second-round community consultation was undertaken to present the findings of the baseline Sustainability Assessment to test and further scope the longlist options with the community by the project team. From this, additional options were identified and included within the longlist. Feedback from community members was received via face-to-face discussion through workshops and drop-in sessions, as well as via an online survey (for Masig Island). In addition, technical workshops were held with core State Government agencies to further scope and test the feasibility of options, and align with other government funded initiatives where relevant.

The feedback from community, key stakeholders and government agency consultations was documented by the project team, collated and analysed in a process led by EarthCheck. This information was used to update the final options longlist. The longlist for Masig Island comprised 45 options. Refer to Appendix A.

whereby an options assessment methodology was applied to filter down the Phase 1 longlist to a shortlist of options (maximum of 30) for progression to final project option.

The options assessment undertaken by the project team has been informed by community consultations, technical workshops, desktop review and the Sustainability Assessment.

The final shortlist of options to be taken forward for final project option are those options which:

- Have potential to lower carbon emissions and/or promote island resilience/self-sufficiency; and
- Have the support of community and key stakeholders; and
- Have a positive potential impact upon economic, social and environmental outcomes; and
- Do not replicate or detract from other initiatives already underway on the Islands

The outcome of the assessment is that 18 options will progress to final project option for Masig Island.

NEXT STEPS

Phase 3: In this phase final project options are to be developed by Arup with input from the project team and community/stakeholder engagement for up to 30 of the highest scoring options. For Masig Island 18 options will progress to final project option.

Phase 4: In the final phase of works, reporting will be finalised and the final final project options handed over to the community / key stakeholders. This phase will be led by EarthCheck.

ARUP

2.0 Options assessment methodology

2.0 Options assessment

2.1 Overview

ARUP

DEVELOPMENT OF APPROACH

The development of the options assessment approach was undertaken by Arup in an iterative and collaborative manner with the wider project team. The assessment has been informed by community and stakeholder consultations, technical workshops, desktop review and the Sustainability Assessment.

The intent of the Phase 2 assessment was to provide a consistent and robust approach to appraising the longlist of options to arrive at a shortlist of options to proceed to Phase 3.

The longlist options generated by the Phase 1 engagement process were highly variable in scope, function, outcome, complexity and topic, recognising the wide range of sustainability opportunities on the Island.

It was agreed that for an option to be found credible and proceed to final project option it must:

a) Be community and key stakeholder supported or led

b) Reduce carbon emissions and promote island community resilience

c) Be achievable within the next 5-10 years

d) Not duplicate or negatively impact other initiatives already underway on island

e) Consider positive and negative impacts from a social/cultural economic and environmental perspective

To capture these requirements, a ‘gateway’ approach to options filtering was developed as the basis of the assessment. This integrates three discrete appraisal processes (or ‘gates’).

Gate 1. Alignment with project objectives
Gate 2. Achievability
Gate 3. Multi-criteria analysis

Each gate is described in detail in the following section.

2.0 Options assessment

2.1 Overview

ARUP

DETAILED METHODOLOGY

The options assessment process employs a ‘gateway’ approach to arrive at an options shortlist. The gateway approach takes an early options through a series of tests known as ‘gates’ – to assess whether it meets the projects objectives. This approach is as follows:

1. Gate 1: Project objectives considers the alignment of options with key project objectives, resulting in a pass/fail score for each option:

   a) Decarbonisation potential; and/or
   b) Contribution to community resilience /self-sufficiency; and
   c) Community and key stakeholder support

   Firstly, options are appraised to determine if they have carbon abatement potential and/or the ability to contribute to island self-sufficiency. (*Note: the definition for community resilience / self-sufficiency is provided in the next section*).

   Options were then assessed by whether or not they were generally supported by the community.. The views of the community and key stakeholders were also sought to better understand the potential viability of the options, and other pertinent contextual information. Key stakeholders included Council, Ergon Energy, Project Operational Working Group, Community Groups and similar groups with a direct interest. This process was informed by desktop research, and the stakeholder and community consultation sessions both on-island and in meetings with the project team.

   Options not meeting these requirements were not progressed to Gate 2.

2. Gate 2: Achievability introduces an intuitive logic test. Each option is considered according to whether or not there may exist prohibitive constraints to its successful implementation. Such issues include consideration of physical availability of space, supply chain maturity, or technological feasibility/market readiness of key technologies.

   In addition, it considers the alignment of options with other existing or planned initiatives known to be implemented on an island. Where an option contradicts, negates or otherwise does not support these initiatives, professional judgement is employed to determine if the option should be progressed.

3. Gate 3: Multi-criteria analysis (MCA) enables the relative comparison of option performance against key environmental, social and economic criteria. Options were scored against weighted criteria relating to economic opportunity, livability and wellbeing, protection of cultural and natural heritage, and environmental protection. The top scored options were to progress through to the shortlist for final project options (up to maximum of 30 options). Option criteria and weightings were developed by Arup, and reviewed by the wider project team. Final MCA criteria and weightings are provided in Appendix B. Options were also considered where relevant against their potential to align with the National Indigenous Reform Agreement (NIRA) building blocks as endorsed by COAG. Detail on NIRA building blocks considered in MCA are included in Appendix F.

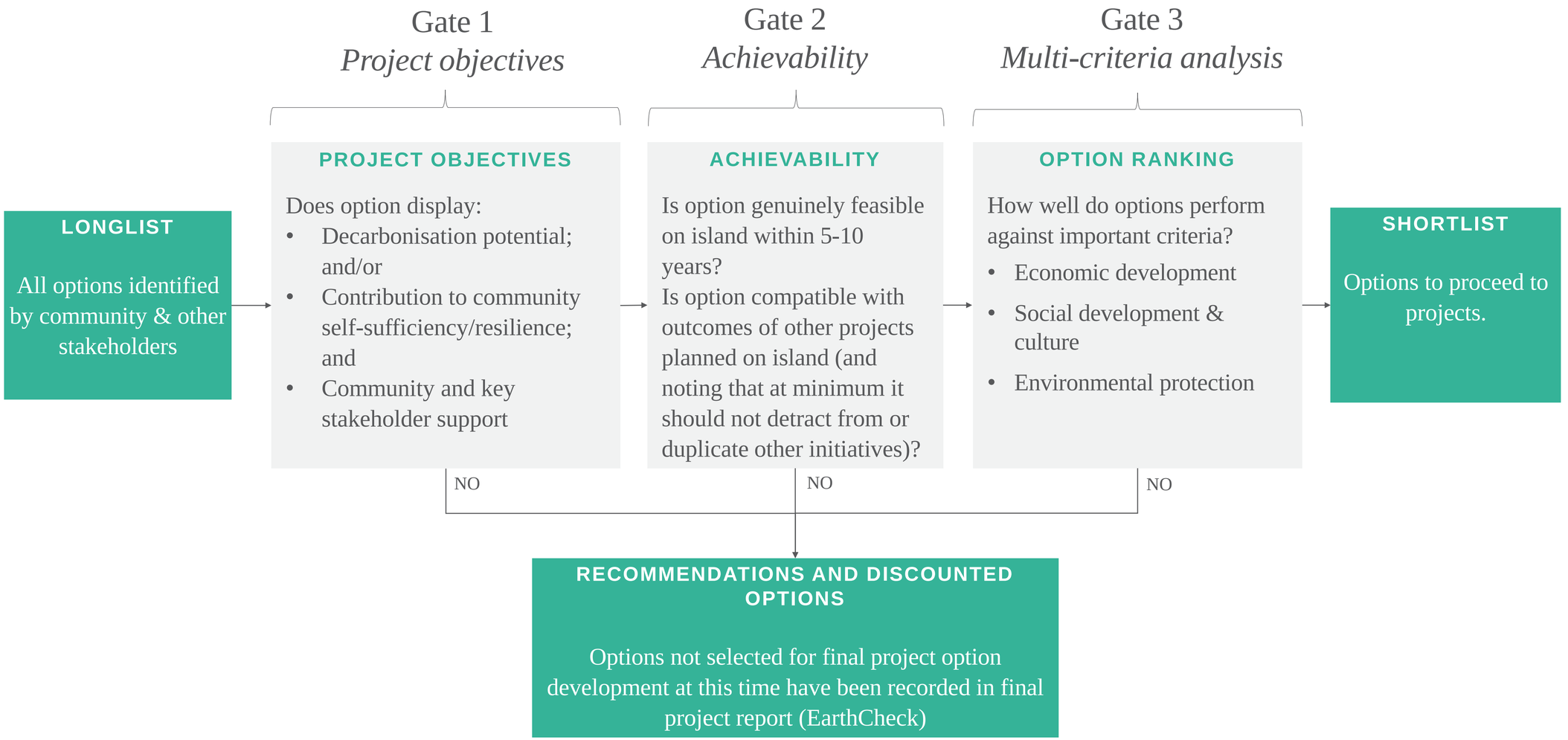
Recommendations and Discounted Options: Options which did not progress to the shortlist were collated, summarised and documented for reference purposes within the final report. Those identified through consultation with strong merit, but did otherwise not fit within the scope and bounds of the project were documented as ‘recommendations’.

The options assessment gateway process is presented in the figure overleaf.

2.0 Options assessment

2.1 Overview

ARUP



2.0 Options assessment

2.2 Gateway approach: Gate 1

Gate 1 provides an initial, high-level screening to ensure options align with the project objectives and intended outcomes.

GATE 1A: PROJECT OBJECTIVE – DECARBONISATION & RESILIENCE

The ability of the option to reduce baseline carbon and other greenhouse gas emissions was determined qualitatively at a high level (*yes/no*). This assessment was made through consideration of both direct and indirect emissions. This includes: opportunities where the emission sources were generated on-island; where emission sources were not owned or controlled directly by the Island's businesses or residents (e.g. commercial transport to/from island); or where emissions were generated off-site such as connected mainland electricity[2].

In addition, options were assessed according to their potential to improve Island self-sufficiency and community resilience to severe weather and the effects of climate change.

For the purpose of this project, self-sufficiency has been defined as: *A form of resilience which enables the community to reduce reliance on the mainland for important goods and services, particularly in the context of severe weather events, pandemic and climate change (includes stand-alone systems)*

The ability of the option to contribute to self-sufficiency in this respect was determined qualitatively at a high level (*yes/no*).

GATE 1B: COMMUNITY AND KEY STAKEHOLDER SUPPORT

As finalised final project options will be handed back to the community and/or key stakeholders (such as Councils, business and utility providers) to champion next steps, support is vital for the successful outcomes of the project.

The community and key stakeholders were consulted in the development of longlisted options during the first project team site visits. An additional round of community input and feedback was sought on options through the second site visits. Here, the community and stakeholders were able to indicate their level of support for options through conversations with the project team and via surveys.

The project team also engaged with Operational Working Groups throughout the duration of the project[2]. Views and feedback received by these group members was also documented and will be considered throughout the options assessment process.

Where there is deemed to be insufficient or inconclusive information regarding the extent of community and stakeholder support, professional judgement was employed by the project team.

GATE 1 SUMMARY

Options which were deemed to have either a decarbonisation and/or self-sufficiency benefit and community and stakeholder support were progressed to Gate 2.

1. This approach broadly aligns with NGER Framework emission scope classifications.

2. Engagement with the Palm Island Operational Working Group was more limited, being established towards the end of Phase 2

2.0 Options assessment

2.3 Gateway approach: Gate 2

ARUP

GATE 2: ACHIEVABILITY

Options progressing through the Gate 1 assessment were then tested against key viability constraints. This approach recognised that whilst an option has merit, there may exist significant constraints which ultimately make it untenable. Considerations included:

1. Compatibility with other initiatives/programs occurring on or planned for the island

It is acknowledged that a range of existing and planned initiatives are, or will be implemented on island through programs led by other organisations or government agencies. Such initiatives may include changes to policy, infrastructure development projects, service changes and other investments. It is critical that the options taken to final project option do not:

a) Unnecessarily duplicate efforts; or

b) Conflict with the objectives of, or negate the intended outcomes of other initiatives. However, it should be noted that where an initiative may have improved the sustainability outcomes of an existing or planned project, this was investigated.

Each longlisted option was therefore considered within this context. This process was informed by desktop research and stakeholder and community consultation sessions, both on-island and in meetings with the project team. The professional knowledge held by the project team regarding existing and planned State Government initiatives also informed this process.

2. Timeframes

It is preferable that shortlisted options are those which can be effectively implemented within up to a maximum 5 – 10 year timeframe. This may occur where, for instance, the option incorporates untested technology which is not market-ready, or where critical supply chains are underdeveloped or non-existent.

3. Feasibility

Where the successful implementation of an option requires excessive and unacceptable physical resource use it is not considered feasible. For instance, an option which requires more land than is physically or practically available on the island would not be feasible.

Similarly, an option will not be feasible where the conditions or resources required to successfully build, implement, or operate it are unavailable or non-existent. However, the absence of required local expertise was not necessarily considered a barrier, as the project also seeks to build capacity and capability.

GATE 2 SUMMARY

Options for which a significant constraint as outlined above was identified did not progress through Gate 2. The outputs of the Gate 2 assessment can be seen in Appendix C.

2.0 Options assessment

2.4 Gateway approach Gate 3

GATE 3: MULTI-CRITERIA ANALYSIS

Options which progressed through Gate 2 were then analysed through a MCA. Here, the relative performance of options were compared, according to weighted economic, social and environmental criteria. Criteria were developed to reflect core project objectives which fell into the three broad objective categories of:

- Economic development
- Social development & culture
- Environmental protection

The intention of an MCA is to objectively assess each option's merit in achieving positive outcomes in line with these criteria, and with community expectations.

It was recognised that there are numerous criteria of importance to the community. However, the number of criteria considered in the MCA needs to be carefully considered. As more criteria are included in an MCA, their respective weightings become lower, diluting the value of the assessment.

The economic development criteria reflected the importance of enhancing economic opportunity and associated issues such as job creation and capacity building.

To align with project objectives and counter the often negative social and environmental by-products of economic growth, criteria were included that would prioritise the wellbeing and celebration of the community and its environmentally sensitive location.

Each criterion was assigned a weighting with the intention of reflecting a balanced and sustainable basis for development.

Each option was then assigned a score on a linear scale (1 to 5) to indicate its relative performance against a criterion. 5 being the highest, 3 neutral and 1 poor. Refer to Appendix B.

The weighted average score for each option was then calculated, enabling options to be ranked. As previously outlined, if there were in excess of 30 options, only the 30 which had the highest rankings would progress to the shortlist for final project option.

Please refer to Appendix B for the MCA assessment criteria and weightings.

2.0 Options assessment

2.5 Final Shortlist

FINAL OPTIONS SHORTLIST

The output of the options assessment was the final shortlist of options to be taken forward to final project option.

As noted previously, care was taken where possible to promote a balanced representation of top-performing options in each of the six key themes of Energy Generation, Energy Efficiency, Water, Waste, Transport and Resilience.

The final options shortlist can be found in Appendix D.

ARUP

3.0 Assumptions and drivers

3.0 Assumptions and drivers

ARUP

OPTIONS ASSESSMENT METHODOLOGY

A bespoke approach was taken in the development of the options assessment methodology. It was developed collaboratively and in consideration of a range of key drivers and desired outcomes of the community and DES.

- The project is underpinned by a desire for stakeholder /community-led, and community-supported outcomes. The longlist and the options assessment process have endeavored to reflect this value.

- The options longlisting process was led by EarthCheck, in consultation with DES, RES, QTIC and Arup, based primarily upon community and stakeholder consultation findings and the outputs of the Sustainability Assessment from project Phase 1.

- The options assessment methodology is a bespoke process reflecting the value of community involvement, and reflecting the diverse nature of longlisted options. The methodology was developed iteratively, and in collaboration with the project team - DES, RES, QTIC and EarthCheck, as well as with feedback from the stakeholders and community during the second round of Island visits and engagement.

- The methodology was developed in recognition of the project objectives of decarbonisation, self-sufficiency and for community and stakeholder support. It also recognised the importance of options not replicating or detracting from other initiatives already underway including the NIRA Building Blocks for closing the gap.

CONTEXT AND LIMITATIONS

It must be noted that there exist limitations to this analysis of strategic options.

Imperfect information is a key limitation; at the strategic level there are always many unknowns and reasonable assumptions must be developed.

Examples of unknowns include the expected demand for a service; size and scalability of an initiative; maturity of supply chains; site conditions and technical feasibility; and cost.

Options were assessed robustly according to the outlined methodology, however, this must be understood within the context of unknowns and uncertainties.

Reasonable assumptions were developed as a basis for assessing the potential scope, impact and merits of each option and best professional judgement was employed in drawing conclusions.

ARUP

4.0 Next steps

4.0 Next steps

ARUP

4.1 FINAL PROJECT OPTION DEVELOPMENT

The output of the options assessment process is a shortlist of options to be taken forward to final project option.

It should be noted that for the purposes of this project, ‘final project options’ are:

- short summary documents to describe the potential scope, benefits (carbon and/or resilience/self sufficiency), co-benefits such as job creation, as well as challenges and risks associated with the identified opportunities. The final project options are based on high level qualitative assessments and assumptions using information available to the project team at the time. Where feasible and robust, quantified benefits are included.
- intended to support stakeholders and community in applications for grant funding to progress next steps in project development, such as undertaking feasibility studies. Consideration of potential funding sources is also included in the final project options.
- it should be noted these are not detailed final project options, and are not suitable for investment decisions to be made upon. Further assessment of feasibility, design, planning, cost and benefits etc. is required before progressing. It is envisaged that grant funding will support the progression of options from opportunities to an investment ready project.

final project options are developed for the purpose of being handed over to the stakeholder and/or community to champion and progress next steps.

4.2 COMMUNITY CONSULTATION AND FINALISATION

The project team will continue to engage with the community and key stakeholders on the draft final project options remotely due to COVID-19 restrictions.

Feedback will be sought to confirm any gaps in the project team’s understanding. Feedback will be documented and used to inform final project option finalisation.

The final reporting for the project will be led by EarthCheck with support from the project team.

ARUP

Appendices

ARUP

Appendix A

Options longlist

Appendix A | Masig Island options longlist

ARUP

LONGLIST

The longlist options identified by the community, key stakeholders and the project team are outlined in the table below (as provided to Arup by EarthCheck). These are grouped according to theme.

Theme	ID	Title	Description
Energy	**E1**	Community-wide energy consumption education and training	Education and training for community-wide energy consumption, including technical solar upskilling to a few key people, to encourage more efficient energy use and upskill the community through employment opportunities.
Energy	**E2**	Existing building improvements	Improvements to existing residential and commercial buildings, such as air flow, insulation and heat reflective roof paint, to increase comfort in homes and reduce energy.
Energy	**E3**	High efficiency and natural lighting for buildings	Installation of high efficiency lighting, such as LED lights, and natural lighting, such as skylights, to increase comfort and reduce energy consumption.
Energy	**E4**	High efficiency appliances and refrigeration units upgrade program	Upgrade program for the purchase and installation of high efficiency energy and water appliances and refrigeration units, to decrease energy use and associated costs.
Energy	**E5**	Solar powered or high-efficiency air conditioning for domestic use	Installation of solar powered or high efficiency air conditioning units for domestic behind the meter use as a complementary system for day-use only, to decrease energy use and associated costs.
Energy	**E6**	Smart solar cells in streetlights and solar lighting across community	Installation of smart solar cells and solar streetlights in targeted areas around island, such as the jetty, boat mooring and community hall, to create safer communal spaces. This would also look at upskilling the community through employment opportunities.
Energy	**E7**	New rooftop solar systems with battery storage	Rooftop solar panels with battery storage on residential and commercial building with peer to peer sharing, to increase community self-sufficiency, reduce energy costs and upskill the community through employment opportunities, by reducing dependence on fossil fuels.
Energy	**E8**	Wind turbines for residential or commercial energy generation	Installation of wind turbines on the Island to supplement or replace current energy supply, which could potentially provide behind the meter energy.
Energy	**E9**	Tidal or wave energy generators	Installation of wind turbines on the Island to supplement or replace current energy supply, which could potentially provide behind the meter energy.
Energy	**E10**	Heat recovery from compost	Scheme for heat recovery from compost for energy production, to reduce reliance on fossil fuels for energy generation.

Appendix A | Masig Island options longlist

ARUP

LONGLIST

Theme	ID	Title	Description
Resilience	**R1**	On-island food production	Establishment of on-island food production, such as hydroponic and aquaponic farms, community gardens, and livestock, to sell produce to local community and increase self-sufficiency.
Resilience	**R2**	Traditional knowledge and culture keeping and transferring	Implementation and facilitation of Traditional Knowledge and culture keeping and transfer, such as stories, boat building knowledge and skill training, to value and share this knowledge and culture.
Resilience	**R3**	On-island sustainability officer	Creation of an on-island paid position for a sustainability officer/project manager responsible for overseeing the development and progression of final project option initiatives, to encourage on-island sustainability and promote project success.
Resilience	**R4**	Revegetation and blue carbon sequestration	Implementation of revegetation and blue carbon sequestration initiatives, such as coral, dune grass, terrestrial, mangrove and seagrass, to reduce erosion which impacts surrounding water quality and therefore availability of food harvested from surrounding seas, increasing island resilience.
Resilience	**R5**	Additional communication systems	Incorporation of additional communication systems, such as emergency, internet, GPS and mobile communication, to improve telecommunications coverage on the island for both residents and businesses.
Resilience	**R6**	Masig Island long term vision and plan	Development of a Masig Island long term vision, incorporating resilience, tourism, development planning, fire, land and sea, and erosion management, to ensure sustainability and resilience planning into the future.
Resilience	**R7**	Island-specific public housing design code	Involvement of the community in the development of an island-specific public housing design code, to ensure housing is suited to the conditions and needs on the Island as well as be sustainable into the future.
Resilience	**R8**	Jetty design upgrade/replacement	Upgrade/replacement of Island’s jetty, to reduce sand accumulation and increase capacity to operate with rising sea levels.
Resilience	**R9**	Rock wall installation and upgrades	Upgrade and installation of rock walls at key areas around the island based on a feasibility study outlining the key issues and challenges.
Resilience	**R10**	Wind wall installation	Installation of wind wall at key areas on the island, to reduce the speed of winds potentially causing erosion and damage.
Resilience	**R11**	Establish banking services on the island	Implementation of banking services on the island with full time position, to reduce need for individuals and business to travel to the mainland or Thursday Island for these services.

Appendix A | Masig Island options longlist

ARUP

LONGLIST

Theme	ID	Title	Description
Transport	**T1**	Bicycles and active transport	Scheme to promote the use of bicycles and other modes of active transport, such as e-bikes, bike-cabs or solar powered tuk-tuks, to lower the carbon footprint from transportation and provide alternative and lower cost options to vehicles, while improving community health benefits.
Transport	**T2**	On-island shuttle bus	Introduction of on-island shuttle bus for council and public transport use, powered either as an electric vehicle or by alternative fuels, to increase community development, reduce the price of transport and reduce fossil fuel consumption.
Transport	**T3**	Flight school on Masig	Promotion of flight school on Masig, to encourage the Indigenous population to become pilots for the TS region.
Transport	**T4**	Alternative fuels for vehicles	Introduction of alternative fuels for land, marine and air vehicles, to reduce the carbon footprint of current Island transportation.
Transport	**T5**	Increase size and capacity of planes	Increase size and capacity of planes to island, to decrease trip frequency and therefore reduce emissions.
Transport	**T6**	Fuel efficient personal vehicles and upgrades	Upgrades to fuel efficient personal vehicles, such as EV, biodiesel or hydrogen, to reduce fuel emissions and dependency on fossil fuels.
Transport	**T7**	Community-run barge	Introduction of a community-run barge using high efficiency diesel or alternative fuel, to increase Island self-sufficiency and reduce carbon emissions.
Waste	**WS1**	SeaSwift and School container collection program	Development and promotion of SeaSwift and School container collection program, to reduce plastic waste incinerated and sent to landfill on Island.
Waste	**WS2**	Whole of island composting scheme	Development of a composting scheme for the whole of island, such as worm farms, biowaste, household waste and mulcher, to offer a better use of these waste resources, contribute to an enhanced environment and support self-sufficiency in conjunction with initiatives to grow food on island.
Waste	**WS3**	Waste management scheme	Improvement of waste management, involving phasing out single use items, metal waste removal, white goods/e-waste recycling, comingled waste and efficient incinerators, to reduce the amount of waste produced and sent to landfill.
Waste	**WS4**	Community bin building campaign	Community bin building campaign, encouraging art and design as well as actively involving the community in waste management.
Waste	**WS5**	Bulk purchasing and selling	Encouragement of bulk purchasing and selling for organisations, to reduce amount of plastic waste related to packaging produced and sent to landfill.

Appendix A | Masig Island options longlist

ARUP

LONGLIST

Theme	ID	Title	Description
Waste	**WS6**	Modify procurement practices	Modification of procurement practices to replace single use plastic and other disposable waste forms from the supply chain, to reduce plastic waste sent to landfill and carbon emissions.
Waste	**WS7**	Waste management optimisation	Optimisation of waste management including the upgrade of dump site with crushers or bailers, waste separation and white goods recycling, shipping waste off island, smart bins, more efficient incineration practices, to reduce the volume of waste send to landfill and carbon emissions.
Waste	**WS8**	Sewage plant effluent to create fertiliser	Use of sewage plant effluent to create fertiliser for use on the island and for or use in garden irrigation, to reduce potable water usage and increase effective water reserves.
Waste	**WS9**	Waste education and communication campaign	Education and communication campaign around waste, such as green waste or organics reduction and removal of recyclable materials from the island, to divert waste from landfill and reduce pollution.
Waste	**WS10**	Upgrade of Sewage Treatment Plant	Upgrade of sewage treatment plant with solar generation and possible battery integration, to significantly reduce the Island’s carbon footprint through a reduced reliance on diesel-powered electricity generation.
Water	**WT1**	High efficiency pumps for desalination and water distribution	Introduction of high efficiency pumps for desalination and water distribution, to reduce dependence on fossil fuels and overall carbon footprint of the island.
Water	**WT2**	Increase water harvesting for homes	Increase in water harvesting for homes, such as wells, rainwater tanks, maintenance and education/upskilling, to enhance water security and increase water reserves.
Water	**WT3**	Water efficiency education	Introduction of water efficiency education and communications including a school kids water testing program, water management education and plumbing upskilling for community members.
Water	**WT4**	Water filters for rainwater tanks and bore wells	Installation of water filters for rainwater tanks and bore wells for residents as well as community buildings, to enhance water security and increase effective potable water reserves.
Water	**WT5**	Water stations chilled with solar PV system	Introduction of water stations with a fountain and bottle filling tap, chilled with solar PV system, to promote clean drinking water as the beverage of choice in community and reduce costs from purchasing less bottled water which contributes to waste.
Water	**WT6**	Small scale desalination units for individual wells	Commission a small-scale desalination units for individual wells, to improve quality and reliability of water supply for community and complement the current water supply in times of drought.
Water	**WT7**	Kids' water testing science program	Introduction of kids' water testing science program which could potentially be extended to wider community, to increase awareness around water quality, supply and management.

ARUP

Appendix B

Gate 3: Multi-criteria analysis criteria and weightings

Appendix B | Multi-criteria analysis overview

ARUP

PURPOSE

A Multi-Criteria Analysis (MCA) is a decision-making tool which can be used to compare options that differ across several dimensions. It is typically used to assess aspects of options which cannot (or cannot easily) be quantified or monetised for conclusive comparison. It can be used as a filter to identify which options likely have the most merit (according to the defined criteria). This removes the need for time-consuming and in-depth analysis which is not feasible at the strategic level. An MCA was selected as the Gate 3 sifting mechanism for these reasons.

However, the nature of this project resulted in a longlist of options which are very different to each other, making direct comparisons of merit more challenging. For instance, a water resilience project differs in intent and function to an energy generation project. To ensure the MCA is meaningful in this context, criteria were developed to enable the assessment to focus on how well each option aligned with the core project objectives. The selected criteria are outlined on the next page.

SCORING

The logic behind the scoring mechanism is demonstrated in the table below. However, it must be noted that there exist limitations to this (and any other) analysis. Imperfect information is one; at the strategic level there are always many unknowns and reasonable assumptions must be developed. Examples of unknowns include the expected demand for a service; size and scalability of an initiative; maturity of supply chains; site conditions and technical feasibility; and cost. Scoring was undertaken within this context of uncertainty, using reasonable assumptions and best professional judgement.

Performance against each criterion was assessed on a scale of 1 to 5, as outlined in the table below.

There is a need to recognise the potential subjectivity of the scoring process, to manage the to manage the "excessive specificity“. Arup sought to minimise this subjectivity by the review and challenge of the wider project team (including Masig Operational Team). For example, an option may ‘support economic opportunity’ in a variety of ways (i.e. through job creation; enabling the development of new services or creation of a new business; by increasing consumer or investor confidence; by promoting tourism opportunities; by removing barriers to individuals’ economic progression or wellbeing).

Arup’s team delivered an individual score against each criterion for each project option, along with a statement of underlying rationale. These outputs were presented to the wider project team.

Performance	Score
Option likely to generate a strong positive impact	5
Option likely to generate a positive impact	4
Option likely to generate a neutral or no impact	3
Option likely to generate a negative impact	2
Option likely to generate a strong negative impact	1

The following slide outlines the weightings applied to each criterion.

Appendix B | Multi-criteria analysis criteria

ARUP

MULTI-CRITERIA ANALYSIS CRITERIA

The multi-criteria analysis criteria and weightings for Masig Island are presented in the table below.

Objective category	#	Draft criteria	Proposed weighting
Economic development	1	Potential to support economic opportunity	15%
	2	Potential to support local job creation, skills development and/or capacity building (including consideration of NIRA objectives)	15%
		Total (economic development)	*30%*
Social development & culture	3	Promotion of community self-sufficiency and/or resilience (including consideration of NIRA objectives)	15%
	4	Protection of cultural heritage and assets	15%
		Total (social development & culture)	*30%*
Environmental protection	5	Extent of decarbonisation potential	25%
	6	Preservation of environmental, ecological and/or natural resources	15%
		Total (environmental protection)	*40%*
		TOTAL	**100%**

ARUP

Appendix C

Gateway assessment outputs

Gate 1: Project objectives
Gate 2: Achievability
Gate 3: Multi-criteria analysis

Appendix C | Gateway assessment outputs

ARUP

SIMILAR AND COMPLEMENTARY OPTIONS

In early stages of project development, it was identified that some of the longlist options contained similarities or other complementary aspects that may enable them to be ‘bundled’ together for final project option development purposes.

As the longlist development process continued, some of these options were consolidated into a single (but broader) option where this was considered the most appropriate and logical approach. Other complementary options were kept separate. This process was led by EarthCheck and the intent was to enable more effective and targeted stakeholder engagement on key aspects of these options.

As part of the options assessment process (led by Arup), options were assessed individually through each of the Gateways. This enabled the individual merits of these options to be assessed, and a separate weighted ranking to be returned.

After options passed through Gate 3, Arup consolidated those remaining shortlisted options which were considered to be complementary, and which would benefit from being packaged together into a single final project option. Where this has occurred, it is noted in the Gate 3 assessment outputs in the following pages. Options which failed to progress to final project option are discussed further in Appendix E.

PROGRESSION TO FINAL PROJECT OPTION

A maximum of 30 final project options were to be delivered. The output of the Gate 3 assessment was a ranked listing of the options which had progressed through Gate 2.

If, after consolidation, there were in excess of 30 options, only the 30 which had the highest ranking would progress to the shortlist for final project option development. As the number of final consolidated options was less than 30, all of these options were deemed to have merit and were progressed to final project option.

Appendix C | Gateway assessment outputs

ARUP

GATEWAY ASSESSMENT

Theme	ID	Title	Gate 1	Gate 2	Gate 3	Outcome
Energy	**E1**	Community-wide energy consumption education and training	Pass	Pass	Pass (consolidated)	Shortlist: “Sustainability and environmental traditional knowledge sharing and education”
Energy	**E2**	Existing building improvements	Pass	Pass	Pass (consolidated)	Shortlist: “Energy efficiency improvements for buildings”
Energy	**E3**	High efficiency and natural lighting for buildings	Pass	Pass	Pass (consolidated)	Shortlist: “Energy efficiency improvements for buildings”
Energy	**E4**	High efficiency appliances and refrigeration units upgrade program	Pass	Pass	Pass (consolidated)	Shortlist: “Energy and water efficient appliances”
Energy	**E5**	Solar powered or high-efficiency air conditioning for domestic use	Pass	Pass	Pass (consolidated)	Shortlist: “Energy and water efficient appliances”
Energy	**E6**	Smart solar cells in streetlights and solar lighting across community	Pass	Pass	Pass	Shortlist: “Smart solar cells in streetlights and solar lighting across the Community”
Energy	**E7**	New rooftop solar systems with battery storage	Pass	Pass	Pass	Shortlist: “Rooftop solar systems with battery storage”
Energy	**E8**	Wind turbines for residential or commercial energy generation	Pass	Fail		Recommendation
Energy	**E9**	Tidal or wave energy generators	Fail			Recommendation
Energy	**E10**	Heat recovery from compost	Pass	Fail		Discounted

Appendix C | Gateway assessment outputs

ARUP

GATEWAY ASSESSMENT

Theme	ID	Title	Gate 1	Gate 2	Gate 3	Outcome
Resilience	**R1**	On-island food production	Pass	Pass	Pass	Shortlist: “On-island food production”
Resilience	**R2**	Traditional knowledge and culture keeping and transferring	Pass	Pass	Pass (consolidated)	Shortlist: “Sustainability and environmental traditional knowledge sharing and education”
Resilience	**R3**	On-island sustainability officer	Pass	Pass	Pass	Shortlist: “On-island sustainability officer”
Resilience	**R4**	Revegetation and blue carbon sequestration	Pass	Pass	Pass	Shortlist: “Land restoration and blue carbon sequestration”
Resilience	**R5**	Additional communication systems	Fail			Recommendation
Resilience	**R6**	Masig Island long term vision and plan	Pass	Fail		Recommendation
Resilience	**R7**	Island-specific public housing design code	Pass	Pass	Pass	Shortlist: “Community led housing design code”
Resilience	**R8**	Jetty design upgrade/replacement	Pass	Fail		Recommendation
Resilience	**R9**	Rock wall installation and upgrades	Pass	Fail		Recommendation
Resilience	**R10**	Wind wall installation	Pass	Fail		Recommendation
Resilience	**R11**	Establish banking services on the island	Fail			Recommendation

Appendix C | Gateway assessment outputs

ARUP

GATEWAY ASSESSMENT

Theme	ID	Title	Gate 1	Gate 2	Gate 3	Outcome
Transport	**T1**	Bicycles and active transport	Pass	Pass	Pass	Shortlist: “Low-cost active transport”
Transport	**T2**	On-island shuttle bus	Pass	Pass	Pass	Shortlist: “On island shuttle bus for public transport”
Transport	**T3**	Flight school on Masig	Pass	Fail		Recommendation
Transport	**T4**	Alternative fuels for vehicles	Pass	Fail		Recommendation
Transport	**T5**	Increase size and capacity of planes	Pass	Fail		Discounted
Transport	**T6**	Fuel efficient personal vehicles and upgrades	Pass	Fail		Recommendation
Transport	**T7**	Community-run barge	Pass	Fail		Recommendation
Waste	**WS1**	SeaSwift and School container collection program	Pass	Pass	Pass (consolidated)	Shortlist: “Sustainability and environmental traditional knowledge sharing and education”
Waste	**WS2**	Whole of island composting scheme	Pass	Pass	Pass	Shortlist: “Whole-of-island composting scheme”
Waste	**WS3**	Waste management scheme	Pass	Pass	Pass (consolidated)	Shortlist: “Waste management optimisation”
Waste	**WS4**	Community bin building campaign	Pass	Pass	Pass (consolidated)	Shortlist: “Sustainability and environmental traditional knowledge sharing and education”
Waste	**WS5**	Bulk purchasing and selling	Pass	Pass	Pass (consolidated)	Shortlist: “Waste management optimisation”
Waste	**WS6**	Modify procurement practices	Pass	Pass	Pass (consolidated)	Shortlist: “Waste management optimisation”
Waste	**WS7**	Waste management optimisation	Pass	Pass	Pass (consolidated)	Shortlist: “Waste management optimisation”

Appendix C | Gateway assessment outputs

ARUP

GATEWAY ASSESSMENT

Theme	ID	Title	Gate 1	Gate 2	Gate 3	Outcome
Waste	**WS8**	Sewage plant effluent to create fertiliser	Pass	Fail		Discounted
Waste	**WS9**	Waste education and communication campaign	Pass	Pass	Pass	Shortlist: “Sustainability and environmental traditional knowledge sharing and education”
Waste	**WS10**	Upgrade of Sewage Treatment Plant	Pass	Pass	Pass	Shortlist: “Solar panels with battery integration on Sewage Treatment Plant”
Water	**WT1**	High efficiency pumps for desalination and water distribution	Pass	Pass	Pass	Shortlist: “Upgrade to high efficiency water distribution pumps”
Water	**WT2**	Increase water harvesting for homes	Pass	Pass	Pass (consolidated)	Shortlist: “Energy and water efficient appliances” and “Residential rainwater harvesting” and “Water demand management trial”
Water	**WT3**	Water efficiency education	Pass	Pass	Pass (consolidated)	Shortlist: “Sustainability and environmental traditional knowledge sharing and education”
Water	**WT4**	Water filters for rainwater tanks and bore wells	Pass	Pass	Pass (consolidated)	Shortlist: “Residential rainwater harvesting” and “Water demand management trial”
Water	**WT5**	Water stations chilled with solar PV system	Pass	Pass	Pass (consolidated)	Shortlist: “Water demand management trial”
Water	**WT6**	Small scale desalination units for individual wells	Fail			Discounted
Water	**WT7**	Kids' water testing science program	Pass	Pass	Pass	Shortlist: “Sustainability and environmental traditional knowledge sharing and education”

ARUP

Appendix D

Options shortlist

Appendix D | Masig Island options shortlist

ARUP

SHORTLIST

The options which progressed through the Gate 3 assessment and will progress to final project option are outlined in the table below. These are grouped according to theme.

Theme	ID	Component ID	Title	Description
Energy	**1**	E2, E3	Energy efficiency improvements for buildings	Scheme to provide financial assistance to fund building audits, identify the highest priority upgrade(s) which could include insulation, heat reflective roof paint, awnings, glazing, skylights and natural shading. This will increase comfort in homes and reduce energy costs.
Energy	**2**	E4, E5, WT2	Energy and water efficient appliances	Scheme to provide financial assistance to fund building appliance audits and fund the highest priority appliance purchase(s). This may include LED lighting, higher efficiency appliances (water and energy), energy management and alert systems to monitor electricity use and display this to the resident. Energy efficiency and demand management can decrease electricity use and reduce associated costs.
Energy	**3**	E6	Smart solar cells in streetlights and solar lighting across the Community	Installation of solar streetlights in targeted areas around island (jetty, boat mooring, community hall). This will create safer communal and work environments. This also ensures the community is upskilled in installation and maintenance of lighting in the long-term. This will create safe communal spaces and train/upskill the community (jobs).
Energy	**4**	E7	Rooftop solar systems with battery storage	Rooftop solar panels with battery storage to increase community self-sufficiency by reducing dependence on fossil fuels. This would seek funding for the purchase and installation of the systems for residential and other buildings. Residents to be upskilled to install and maintain systems. This will reduce energy costs and train/upskill the community (jobs).
Water	**5**	WT2, WT4, WT5	Water demand management trial	Develop and trial community-based water demand management approaches, based on the outcomes of Griffith University studies (RICES), consultation with TSIRC, the community and other key stakeholders. The objective of the project is to optimise cost-effective strategies to implement across all Torres Strait islands. This will reduce water consumption and make reserves last longer. This also includes potential for chilled water from via solar powered compressors.
Water	**6**	WT1	Upgrade to high efficiency water distribution pumps	Increase the energy efficiency of the Masig Island water supply system, through optimisation of the existing pump stations and desalination plant, as well as the potential installation of solar PV and/or battery storage to minimise power drawn from the grid. This will reduce dependence on fossil fuels and the overall carbon footprint of the island.
Water	**7**	WT2, WT4	Residential rainwater harvesting	Assessment of existing water harvesting capacity and fund the highest priority harvesting option(s) to meet resident needs for non-potable uses. Potential options include new rainwater tanks, upgrades to existing tanks and filters to broaden the potential uses for the water. This will enhance water security and increase water reserves.

Appendix D | Masig Island options shortlist

ARUP

SHORTLIST

Theme	ID	Component ID	Title	Description
Waste	**8**	WS3, WS5, WS6, WS7	Waste management optimisation	Waste management optimisation involving an upgrade of landfill site with crushers/bailers, waste separation and white goods recycling, shipping waste off island, smart bins and more efficient incineration practices. This will reduce the volume of waste sent to landfill and carbon emissions.
Waste	**9**	WS10	Solar panels with battery integration at Sewage Treatment Plant	Solar panels and battery storage for the sewage treatment plant to significantly reduce the island's carbon footprint through less reliance on diesel-powered electricity generation.
Waste	**10**	WS2	Whole-of-island composting scheme	This involves a composting scheme for the whole island, where both the community and businesses dispose organic waste to generate compost which can be used on gardens. This can reduce the waste going to landfill and instead provide high quality fertiliser to the community.
Transport	**11**	T1,	Low-cost active transport	Bicycles, electric bicycles or pedicabs/tuk tuks for the community. This will lower the carbon footprint from transportation and provide alternative and lower cost options to vehicles. This will reduce the expenses associated with cars on the island, increase community health and reduce carbon emissions.
Transport	**12**	T2	On island shuttle bus for public transport	Accessible and regular on-island public transportation system using electric or hybrid vehicle(s). This can increase community development (jobs and access), reduce the price of transport and reduce fossil fuel consumption.
Resilience	**13**	R1	On-island food production	Develop an on-island farm or market garden for the community. Gradual diversification of produce over time. This can enhance community self-sufficiency and has the potential to provide job opportunities for the community.
Resilience	**14**	R3	On-island sustainability officer	On-island sustainability officer/project manager responsible for overseeing the development and progression of final project option initiatives. The position would also have the responsibility of championing the progression of other sustainability initiatives identified through future programs. This role is intended as a position to advocate for the community in the roll out of projects and initiatives; to champion and coordinate key activities; to assist in identifying barriers to project progression; and to take responsibility for finding solutions to enable projects to be delivered.
Resilience	**15**	R4	Land restoration and blue carbon sequestration	Develop and implement land and sea regeneration projects (carbon sequestration in terrestrial, estuarine and marine environments). This may include revegetation of terrestrial habitats, erosion prone areas as well as the reef. This can increase the island's resilience by reducing erosion which will have an impact on surrounding water quality and therefore availability of food harvested from surrounding seas. Reducing erosion will help conserve sand on the island as well as reduce the loss of land and damage to cultural/sacred sites.

Appendix D | Masig Island options shortlist

ARUP

SHORTLIST

Theme	ID	Component ID	Title	Description
Resilience	**16**	R7	Community led housing design code	Involve the community in the development of a housing design code, to ensure housing design is suited to the conditions and needs on the Island as well as be sustainable into the future. This will ensure homes are contextually appropriate and adapted.
Resilience	**17**	E1, R2, WS1, WS4, WS9, WT3, WT7	Sustainability and environmental traditional knowledge sharing and education	Development of sustainability and environmental traditional knowledge sharing and education. The purpose is to value and share cultural knowledge while upskilling the community. This will contribute to community, culture and economic development (jobs).

ARUP

Appendix E

Recommendations and discounted options

Appendix E | Masig Island option recommendations

ARUP

RECOMMENDATIONS

Recommendations are options that have not progressed through to the options shortlist, but which have merit and potentially represent areas for future consideration. These do not include options which were not supported by the community, or were found to be infeasible. Recommendations may not progress for a variety of reasons, including:

- Where work is already planned through initiatives external to the project
- Where it is considered to be out of scope of this project
- Where the required technologies are not likely to be market ready in the short- to medium-term
- Where the existence or maturity of required supply chains represent a barrier to option success

Theme	ID	Title	Rationale
Energy	**E8**	Wind turbines (large or small) for residential or commercial energy generation	Work is already being conducted under the ARENA program
Energy	**E9**	Tidal or wave energy generators	This technology is considered to be costly to install and maintain and may disrupt marine life. The effectiveness of the technology in this location is also not clear. This option was not supported by the community.
Transport	**T3**	Flight school on Masig to promote indigenous pilots for the Torres Strait region	Captured in the current Master Plan and also unlikely to be feasible within 5 to 10 years
Transport	**T4**	Alternative fuels for vehicles (land, marine and air)	Market readiness of marine / aircraft and medium-term supply chain constraints
Transport	**T6**	Fuel efficient personal vehicles and upgrades (such as EV, biodiesel or hydrogen – as applicable)	Not likely to represent value for money for personal use, especially given focus to prioritise increased walking and cycling
Transport	**T7**	Community-run barge	There is an existing barge service operated by SeaSwift which would be displaced by a new service. It is also unclear if there is sufficient demand or capacity to maintain an additional service. The addition of a new service would increase carbon emissions.

Appendix E | Masig Island option recommendations

ARUP

RECOMMENDATIONS

Theme	ID	Title	Rationale
Resilience	**R5**	Additional communication systems (emergency, internet, GPS, mobile communication)	This option is an enabler to others. Digital connectivity can remove barriers to community resilience.
Resilience	**R6**	Develop a Masig Island long term vision and plan (resilience, tourism, development planning, fire, land and sea, erosion management)	This recommendation falls somewhat outside project scope and is also reflected in work already underway through the Master Plan.
Resilience	**R8**	Jetty design upgrade/replacement to reduce sand accumulation and increase capacity to operate with rising sea levels	Considered out of scope, and action may already be undertaken through other programs.
Resilience	**R9**	Rock wall installation and upgrades	Work is already underway through QCoast2100 that will help inform decisions around this recommendation.
Resilience	**R10**	Wind wall installation	This recommendation is not feasible on the island within 5-10 years but should be considered in future planning.
Resilience	**R11**	Establish banking services on the island (office)	This recommendation is outside the scope of this project.

Appendix E | Masig Island discounted options

ARUP

DISCOUNTED OPTIONS

Other options put forward by the community and stakeholders were assessed, but ultimately not determined to constitute a viable final project option or recommendation. These discounted options are presented in the table below. An option may have been discounted for reasons including:

- Low levels of community support for the option
- The strong likelihood that an option would be infeasible in a technological, technical or physical sense
- The strong likelihood that an option would consume or divert significant resources from other critical uses

Theme	ID	Title	Rationale
Energy	**E10**	Heat recovery from compost	This is considered to be a technically complex solution to energy generation for an isolated community which also requires specific capacity, resourcing and expertise. Other energy initiatives would deliver better outcomes.
Transport	**T5**	Increase size and capacity of planes to island to reduce trip frequency	This would require an extended and upgraded runway, which is highly unlikely to be technically feasible given the physical land constraints on the island. Commercial aviation operators run the commercial transport service to/from the Island. Vertical flight technology, electric and/or low emission fuels may be available in the future to enable decarbonisation opportunities in the aviation sector.
Water	**WT6**	Small scale desalination units for individual wells	This is considered to be a high-cost and complex project which would be both energy and carbon intensive and may pose a risk to public health. The provision of safe and reliable drinking water supply is a complex undertaking, and without proper management can introduce serious human health risks. Further decentralising the water supply in this challenging environment also introduces more operational complexity and cost.
Waste	**WS8**	Sewage plant effluent to create fertiliser	This option is considered to pose potentially serious health risks to the community. It is a complex solution which is not considered suitable in the Masig context.

ARUP

Appendix F

Gate 3 Multi-Criteria Analysis: Summary of interpretation of NIRA Building Blocks for project

NIRA Building Blocks

Considerations for Gate 3 Multi-criteria analysis

ARUP

THE NATIONAL INDIGENOUS REFORM AGREEMENT

The National Indigenous Reform Agreement (NIRA) implements intergovernmental reforms to close the gap in Indigenous disadvantage. In December 2007, the Council of Australian Governments (COAG) agreed to a partnership between all levels of government to work toward this goal.

Given the high populations of Indigenous persons on Masig Island (which is operated by an Indigenous Council), it was considered vital that all longlisted options be considered in the context of compatibility with the NIRA Building Blocks framework. These Building Blocks represent strategic platforms across which major reforms must be directed in order to meet the specific targets to close the gap, as outlined in the NIRA. These Building Blocks are:

1. Early Childhood
2. Schooling
3. Health
4. Economic Participation
5. Healthy Homes
6. Safe Communities
7. Governance and Leadership

COAG acknowledge that strategies aimed at achieving improvements in any area will not work in isolation and that the integration of policy and considerations for strategic implementation must occur together.

INCORPORATING NIRA INTO OPTIONS ASSESSMENT

A range of key terms and definitions were developed to guide the scoring of options within the Gate 3 multi-criteria analysis (MCA) in a consistent manner.

The interpretation of the NIRA Building Blocks for the purpose of the MCA is presented in the following section.

NIRA Building Blocks

Building Blocks outlined in NIRA

ARUP

The following paragraphs are taken directly from the NIRA, and outline the seven key Buildings Blocks deemed critical to improving outcomes for Indigenous people in Australia.

EARLY CHILDHOOD

For an equal start in life, Indigenous children need early learning, development and socialisation opportunities. Access to quality early childhood education and care services, including pre-school, child care and family support services such as parenting programs and supports, is critical. Appropriate facilities and physical infrastructure, a sustainable early childhood education and health workforce, learning frameworks and opportunities for parental engagement are also important and require attention. Action in the areas of maternal, antenatal and early childhood health is relevant to addressing the child mortality gap and to early childhood development.

SCHOOLING

Human capital development through education is key to future opportunity. Responsive schooling requires attention to infrastructure, workforce (including teacher and school leader supply and quality), curriculum, student literacy and numeracy achievement and opportunities for parental engagement and school/community partnerships. Transition pathways into schooling and into work, post school education and training are also important.

HEALTH

Indigenous Australians' access to effective, comprehensive primary and preventative health care is essential to improving their health and life expectancy, and reducing excess mortality caused by chronic disease. All health services play an important role in providing Indigenous people with access to effective health care, and being responsive to and accountable for achieving government and community health priorities. Closing the Indigenous health gap requires a concerted effort in the prevention, management and treatment of chronic disease. Indigenous children and their parents need to access programs and services that promote healthy lifestyles.

NIRA Building Blocks

Building Blocks outlined in NIRA

ARUP

ECONOMIC PARTICIPATION

Individuals and communities should have the opportunity to benefit from the mainstream economy – real jobs, business opportunities, economic independence and wealth creation. Economic participation needs to extend to disadvantaged job seekers and those outside of the labour market. Access to land and native title assets, rights and interests can be leveraged to secure real and practical benefits for Indigenous people. Other financial assets, capacity building, employment and training programs, incentive structures and social and physical infrastructure, including communications and transport, are needed to foster economic participation and community engagement. Through this participation, parents and other adults can become effective role models for their families and community. The design and delivery of welfare (both transfer payments and services) needs to promote active engagement, enhanced capability and positive social norms. Ensuring that communities have support to address factors that are a barrier to engagement such as problem gambling is critical. Life-long learning is important and attention is also needed regarding adult literacy and numeracy skills.

HEALTHY HOMES

A healthy home is a fundamental precondition of a healthy population. Important contributors to the current unsatisfactory living conditions include inadequate water and sewerage systems, waste collection, electricity and housing infrastructure (design, stock and maintenance). Children need to live in accommodation with adequate infrastructure conducive to good hygiene and study and free of overcrowding.

SAFE COMMUNITIES

Indigenous people (men, women and children) need to be safe from violence, abuse and neglect. Fulfilling this need involves improving family and community safety through law and justice responses (including accessible and effective policing and an accessible justice system), victim support (including safe houses and counselling), child protection and also preventative approaches. Addressing related factors such as alcohol and substance abuse will be critical to improving community safety, along with the improved health benefits to be obtained.

GOVERNANCE AND LEADERSHIP

Strong leadership is needed to champion and demonstrate ownership of reform. Effective governance arrangements in communities and organisations as well as strong engagement by governments at all levels are essential to long term sustainable outcomes. Indigenous people need to be engaged in the development of reforms that will impact on them. Improved access to capacity building in governance and leadership is needed in order for Indigenous people to play a greater role in exercising their rights and responsibilities as citizens.

NIRA Building Blocks

Considerations for Gate 3 Multi-criteria analysis

ARUP

CONSIDERATIONS FOR MULTI-CRITERIA ANALYSIS

The MCA's intent is to assess option alignment or non-conflict with the intended outcomes of the NIRA (in reference to the seven building blocks). The points outlined below are intended to guide this assessment.

1. Early Childhood
    a. Access to existing early childhood education and care services for anyone in the community.
    b. Development of new facilities and infrastructure for early childhood education and care.
    c. Opportunities for employment in early childhood education and health.
    d. Early childhood education and health workforce from providing sustainable and quality service to community.
    e. Parental engagement with early childhood education and health issues.
2. Schooling
    a. Development of new schooling facilities and infrastructure.
    b. Opportunities for employment in schooling.
    c. The schooling workforce (including teachers and school leaders) providing sustainable and quality service to the community.
    d. Parental and community engagement with schooling.
    e. Opportunities for school/community partnerships
    f. Transition pathways into school
    g. Transition pathways from school into work and post-school education/training

NIRA Building Blocks

Considerations for Gate 3 Multi-criteria analysis

ARUP

CONSIDERATIONS FOR MULTI-CRITERIA ANALYSIS

Options which do not comply with the following statements will not be progressed to Gate 3 of the short-listing process:

3. Health
    a. Access to effective, comprehensive primary and preventative health care.
    b. Development of new facilities and infrastructure for primary and preventative health care.
    c. Children and parents accessing programs and services that promote healthy lifestyles.

4. Economic Participation
    a. Opportunities for individuals and the community to benefit from the mainstream economy
    b. Access to jobs, including for disadvantaged job seekers and those outside the labour market.
    c. Business opportunities in the community.
    d. Economic independence of individuals and the community.
    e. Access to land and native title assets, rights and interests.
    f. Access to employment and training programs.
    g. Promotion of active engagement, enhanced capability and positive social norms.
    h. Addressing factors that are a barrier to engagement such as problem gambling.
    i. Opportunities for life-long learning and adult literacy and numeracy.

NIRA Building Blocks

Considerations for Gate 3 Multi-criteria analysis

ARUP

CONSIDERATIONS FOR MULTI-CRITERIA ANALYSIS

Options which do not comply with the following statements will not be progressed to Gate 3 of the short-listing process:

5. Healthy Homes
    a. Access to adequate water and sewerage systems, waste collection, electricity and housing infrastructure
    b. Development of new water and sewerage systems, waste collection, electricity and housing infrastructure
    c. Children's permanent access to accommodation which is conducive to good hygiene and study, and which is free of overcrowding.
6. Safe Communities
    a. Members of the community being safe from violence, abuse and neglect.
    b. Law and justice responses to community safety issues across policing and the justice system.
    c. Members of the community from accessing victim support services such as safe houses, counselling and child protection.
7. Governance and Leadership
    a. Development of effective governance arrangements in the community and organisations.
    b. Indigenous people in the community being engaged in the development of reforms which affect them.
    c. Access for Indigenous people in the community to capacity building programs in governance and leadership.

ARUP

We shape a better world