Southland Murihiku Regional Energy Strategy 2022-2050: Summary

Prepared for: **GREAT SOUTH Southland Regional Development Agency**
Prepared by: **Beca Ltd**
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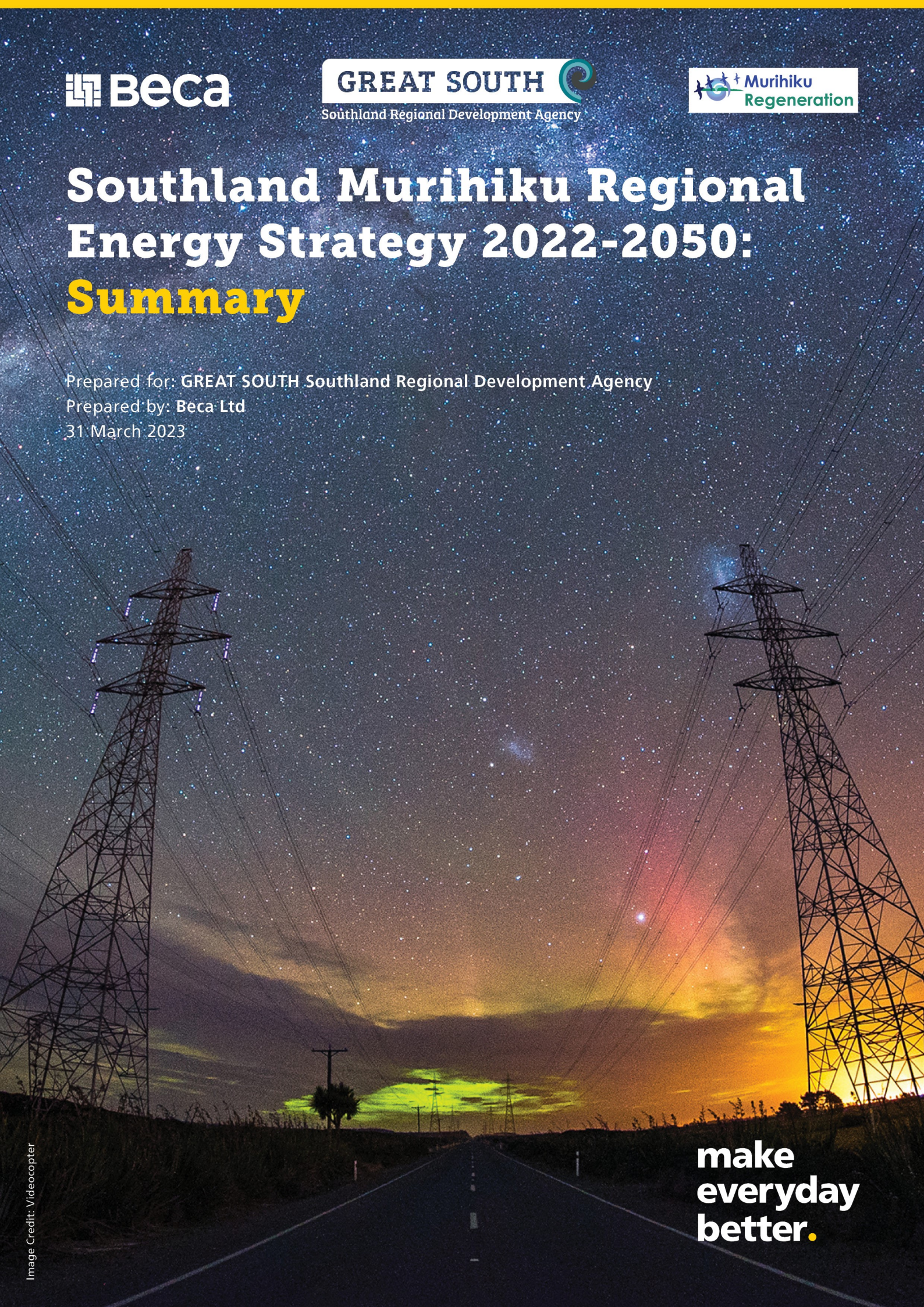

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make everyday better.

Revision History

Revision Nº	Prepared By	Description	Date
A	Michael Flyger	Draft for client review	24 Feb 2023
B	Michael Flyger	Incorporating changes from final report	20 Mar 2023
C	Michael Flyger	Final changes incorporated	24 Mar 2023
D	Mike Pond	Updated with advisory group feedback	31 Mar 2023

Document Acceptance

Action	Name	Signed	Date
Prepared by	Michael Flyger		31 Mar 2023
Reviewed by	Mike Pond		31 Mar 2023
Approved by	Jorge Martinez		31 Mar 2023
on behalf of	Beca Limited		

1 Summary of the Strategy

This summary document has been prepared by Beca to provide an overview of the Southland Murihiku Regional Energy Strategy 2022 – 2050. The full strategy is available to view on the Great South website.

The Project Advisory Group is seeking your feedback and views on the Draft Strategy. Please click here to share your thoughts.

Southland Regional Development Agency (Great South) has partnered with Murihiku Regeneration to develop the Southland Murihiku Regional Energy Strategy 2022 – 2050. This Strategy is the fourth to be carried out by Great South (and its predecessor Venture Southland) with previous energy strategies completed in 2003, 2005 and 2011.

The vision for the Strategy is: **"Energy in Southland Murihiku is clean, resilient and affordable, supporting a thriving community".**

Its purpose is to outline demand and supply of energy in Southland Murihiku, both now and into the future, while considering the challenges and opportunities this brings.

The Southland Murihiku Regional Energy Strategy aligns with the renewable energy focus of the Clean Energy workstream within the Southland Just Transition Work Plan, which was released in January 2022. It will also be a key input into the long-term planning of the Just Transitions work plan, Beyond 2025 Southland.

One of the key aspects of the work is how, and how quickly we can transition from our current state, into a net zero, renewable future across the region.

When considering this, the following parts of the energy trilemma (*right*) must be considered:

- Energy security: keeping the lights on and minimising exposure to global swings in energy markets
- Energy equity: cost for consumers, enabling a just transition
- Environmental sustainability: protecting the local environment and minimising the effects of climate change

Moving from where we are now to a net zero economy by 2050 is a once in a generation investment. It's a big change which must happen quickly, if we're to limit global warming and meet New Zealand's obligations under the Paris Agreement[1]. This is an exciting time and presents both risks and opportunities for our region. In building this Strategy we have identified:

- The current users of fossil fuels in the region
- Where are they located
- What are the fossil fuels used for, and what are the practical renewable alternatives
- When is it feasible to transition to renewable energy
- The expected demand for energy (predominantly electricity and biomass) to support decarbonisation, new business investment and electricity-based transport

[1] https://environment.govt.nz/what-government-is-doing/international-action/about-the-paris-agreement/

- The energy balance within the region. This is the balance or deficit between available energy and future demand, which indicates the scale of new renewable energy required.

One of the key objectives of the strategy is to ensure that consumers and industry have access to affordable energy and that Southland Murihiku's exporters can be globally competitive in a New Zealand setting. Balancing energy supply and demand is critical to achieving this outcome.

2 Energy Strategy Scenarios and Implications

The future of New Zealand's Aluminium Smelter at Tiwai Point (NZAS) and the planned Southern Green Hydrogen (SGH) will have a significant impact on Southland Murihiku's net zero vision.

We've mapped out three scenarios relating to these facilities. It should be noted that these are for planning purposes only, and no likelihood or probability should be read into them.

- **Scenario 1: *Baseline Scenario* – NZAS closes at the end of 2024 and SGH does not proceed**. This will likely mean the region will have a net surplus of electricity generation.
- **Scenario 2: *Transition Scenario* – There is a managed transition of load between NZAS closing and the commissioning of the SGH plant in 2030**. Due to the additional electricity demand from decarbonisation, there is currently insufficient generation available in Southland Murihiku to meet the likely demands of this scenario.
- **Scenario 3: *Green Energy Growth Scenario* – NZAS remains open until 2050, production of SGH commences in 2030.** To an even greater extent than Scenario 2, there is currently insufficient generation available locally to meet the demands of this scenario.

The investigations undertaken as part of the Strategy development show that to advance Scenarios 2 and 3, substantial investment in new renewable energy is essential to meet the energy balance.
Southland Murihiku has a wide range of new **renewable** energy opportunities available to meet energy demand for decarbonisation, new industry investment and electricity-based transport (battery electric vehicles and hydrogen fuelled vehicles).

Regardless of the potential futures outlined above, there are several other challenges and opportunities:

- Onshore wind farms are likely to provide the bulk of new generation in Southland Murihiku. If both NZAS and SGH operate simultaneously, offshore wind or a new hydroelectric development should be considered as part of new renewable energy generation options.
- Whilst solar shouldn't be considered a major contributor to grid scale generation, embedded solar, (close to electricity loads) can make a key contribution to the overall energy entering the grid and can provide energy in areas that are hard to serve through the existing grid or power networks.
- Biomass (from forestry) has an important role in phasing out coal. Increasing demand in this area is likely to put pressure on the local biomass supply chain.
- Biogas is an underutilised resource in Southland Murihiku that has the potential to replace the current LPG demand in the region.
- The areas around Makarewa, Awarua, Mataura and Edendale need infrastructure upgrades to help industry on their decarbonisation journey
- Network investment will also be required to support new generation; initially in areas such as Kaiwera Downs, Blackmount, Kaihiku Range and other areas as new generation develops.
- Network investment will be continuous, particularly in urban areas and adjacent to areas requiring new supply and/or load.
- The decarbonisation of the Edendale dairy factory will require a significant amount of renewable energy both electricity and biomass and early planning to accommodate this load is critically important.

3 The way forward

This is a complex, wide-ranging issue which will require input and collaboration from everyone: the general public, industry, business, the rural sector, education, local and central government, tourism – we all have a part to play. There are opportunities and challenges for everyone, which we've grouped under three themes:

3.1 Market Leadership and Engagement

- Continue to work with the region's major coal users to help them decarbonise their businesses.
- Encourage landlords to publicly disclose the energy performance of non-residential buildings, to encourage progressive improvement in energy efficiency, innovation and design improvement.
- Encourage energy planning to be incorporated into the proposed amendments to the relevant sections of the NZ Building Code
- Work with the energy market to understand how consumers can better manage their use, particularly during periods of high demand
- Promote early engagement with community and iwi around the development of new, renewable energy opportunities within the region.

3.2 Policy and Process

- Provide consenting expertise to our regional leadership, including Murihiku's four Papatipu Rūnaka.
- Use all available information to ensure the development of renewable generation and transmission infrastructure is as low-risk and efficient as possible.
- Advocate for changes to electricity network providers are regulated nationally, to allow fast tracking of electricity grid and network upgrades where they will enable decarbonisation to occur. This change will allow the electricity network providers to lead the way and upgrade ahead of demand, rather than demand being the trigger for upgrades. This will effectively allow the network service providers to 'build it and they will come', which should support more rapid decarbonisation.
- The colocation of complementary industries (and potentially energy generation) is an opportunity to realise numerous efficiencies. Consider ways to incentivise and co-ordinate this development.
- The Strategy has identified a range of new generation opportunities, and it is important that these are considered and incorporated within the proposed new Resource Management Act frameworks and individual Council Spatial Plans. This will help to reduce both the time and costs associated with developing and implementing new projects.
- Work alongside the biomass industry to ensure it is achieving maximum value and efficiency. The industry should also advocate for favourable government policies to increase domestic wood processing and minimise forest floor waste, including forestry slash, to channel surplus biomass into the wood fuels market.
- Ensure our energy infrastructure and key assets are resilient to the impacts of climate change. This includes making sure their location doesn't place the network's resilience at risk in the event of severe weather events, natural disasters, or inundation due to storm surge impacts or sea level rise.

3.3 New Energy

- Southland Murihiku has significant potential in the new renewable energy space, with over 100 potential sites for wind farms identified in the Strategy.
- Locating generation close to demand is the most efficient use of infrastructure. It's possible that Southland Murihiku's entire future energy demand can be met through local renewable generation and storage.

- Southland Murihiku could become self-sufficient, or a net exporter of renewable energy, but new generation investment is required. The Strategy prioritises wind farms, followed by one or a mix of: hydro generation in Otago, large solar development north of Te Anau, Mossburn, and possibly Fairlight, or off-shore wind farms.
- Rakiura Stewart Island's reliance on diesel generation is not sustainable from a cost, environmental or visitor expectation perspective. It is recommended that distributed/roof-top solar generation and storage is installed to supplement diesel generation in the short term. To achieve net zero, a combination of wind and solar generation, paired with energy storage solutions should be explored. These energy storage solutions could be a combination batteries and hydrogen fuel cells supported by locally-produced green hydrogen. It is recommended that Rakiura Stewart Island's electricity be provided through renewable energy by 2030.
- To enhance resilience for Piopiotahi Milford Sound, a comprehensive evaluation of energy needs should take place, with a view to upgrading the current hydroelectrical power system with backup battery or hydrogen storage. It is also recommended that Piopiotahi Milford Sound should transition away from diesel generators to be supported entirely by renewable energy by 2030.
- Conduct a more detailed study looking into a region-wide EV fast charger network, and any infrastructure bottlenecks which may affect this.
- The Southern Green Hydrogen project would represent a major boost to the local economy so supporting this project's success is a significant opportunity for the region. It would allow Southland Murihiku to assist in the production of zero emissions renewable transport fuels, and potentially support the production of green ammonia as a clean fuel substitute for large boilers and an input for fertiliser manufacturing
- Investigate green hydrogen production, storage and use within the region regardless of the future of the Southern Green Hydrogen project to support the decarbonisation of heavy transport.
- Biogas capture technology needs further investigation: this has real potential to help our region reach our broader decarbonisation goals by capturing emissions from dairy ponds, metropolitan and industrial waste treatments plants, and historic landfill sites
- Infrastructure – the rapidly increasing demand for renewable electricity is placing significant pressure on the national grid operator and local power supply networks to be more agile and responsive to new demand. This is a nationwide issue, and we would recommend that the regulations are reviewed to consider how they can enable grid and network providers to invest in a timelier manner. This will enable electrification to happen at the pace required to meet national decarbonisation targets.

Southland Murihiku

Energy Strategy

2022-2050

Key energy investments in the region

Piopiotahi Milford Sound

Add Renewable Energy Storage & Increase in Renewable Generation

Decrease diesel use

Hawea Hydro

Underwood

Makarewa

Invercargill

Awarua Plains

Bluff

Hydrogen Facility Target Area

Biomass

Mataura

Biomass

Edendale

Rakiura Stewart Island

Key

Locations where electricity infrastructure upgrades are required

Add Renewable Generation & Energy Storage

Decrease diesel use

Beca

Murihiku Regeneration

GREAT SOUTH
Southland Regional Development Agency

Murihiku Region

Energy in Southland Murihiku is clean, resilient & affordable, supporting a thriving community

Short to medium term:

Promote and provide support with:

- On site industrial solar and storage
- Domestic Solar
- Smart vehicle charging
- Conversion of industrial process heat to electricity, biomass, biogas and green hydrogen
- Identification of clusters of energy users where co-ordinated capacity development benefits can be actioned
- Development of onshore wind resource near Edendale and Mataura i.e. the medium growth centres

Long term:

Promote and provide support with:

- Onshore and offshore wind to support major loads (SGH)
- Consider new hydrogeneration and storage

Our Future Network

Renewable Energy Generation Sites

Grid scale energy storage near renewables

Electricity Flow

Transmission Lines

Public Charging Stations

Small Scale Hydro

Greenhouse taking waste heat

Smart Appliances In Homes, Rooftop Solar, Smart Housing Developments, Smart Car Clusters

Energy storage hubs in communities

4 We want to hear from you

A key part of adopting the Strategy is ensuring we capture and incorporate public sentiment. We've developed a short consultation document where you can provide your thoughts on the Strategy and its direction. Are we heading in the right direction, or have we missed anything?

Consultation on the Strategy is open for three weeks – from Tuesday 4 April to Wednesday 26 April 2023. You can click here (or use the QR code below) to participate; we'd love to know your thoughts on our energy future.

Public hui events are planned to be held in the following locations:

17 April, 4pm: Croydon Lodge, Gore

18 April, 4pm: Victoria Room, Civic Theatre, Invercargill

20 April, 4pm: Te Anau Club, Te Anau

You are welcome to attend RSVP and venue details contained in the link below

https://forms.office.com/r/3eN0VyJnBj


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