



## COVERSHEET

<b>Ministers</b>	Hon Nicola Willis	<b>Portfolio</b>	Finance
	Hon Paul Goldsmith		State Owned Enterprises
	Hon Judith Collins KC		Science, Innovation and Technology
<b>Title of Cabinet paper</b>	Weather Forecasting System Review Recommendations	<b>Date to be published</b>	15 November 2024

### List of documents that have been proactively released

<b>Date</b>	<b>Title</b>	<b>Author</b>
September 2024	<i>Weather Forecasting System Review Recommendations</i>	<i>Office of the Minister of Science, Innovation and Technology</i>
September 2024	<i>Weather Forecasting System Preliminary Regulatory Impact Statement</i>	<i>Ministry of Business, Innovation and Employment</i>
17 September 2024	<i>Cabinet minute: EXP-24-MIN-0051</i>	<i>Cabinet Office</i>

### Information redacted

**YES / NO**-(please select)

Any information redacted in this document is redacted in accordance with MBIE's policy on Proactive Release and is labelled with the reason for redaction. This may include information that would be redacted if this information was requested under Official Information Act 1982. Where this is the case, the reasons for withholding information are listed below. Where information has been withheld, no public interest has been identified that would outweigh the reasons for withholding it.

Some information has been withheld for the reasons of confidential advice to government and legal professional privilege.

# Regulatory Impact Statement: Implementation of Change to the Weather Forecasting System

## Coversheet

Purpose of Document	
Decision sought:	<b>In-principle agreement</b> to the National Institute of Water and Atmospheric Research Limited (NIWA) acquiring the Meteorological Service of New Zealand Limited (MetService) initially as a wholly-owned subsidiary, and MetService being retained as a brand as New Zealand’s authorised meteorologist, as recommended by the Weather Forecasting System Review (WFS Review).
Advising agencies:	Ministry for Business, Innovation and Employment (MBIE) and the Treasury (Officials)
Proposing Ministers:	The Minister of Science, Innovation and Technology and the Minister for State Owned Enterprises
Date finalised:	<i>August 2024</i>
Problem Definition	
<p>The 2024 Weather Forecasting System Review (WFS Review) undertaken by the consulting firm Sapere concluded there is a compelling case for change in the current weather forecasting system and identified that the current system:</p> <ol style="list-style-type: none"> <li>1. results in uncertainty during severe weather events due to inconsistent messaging from two Crown-owned weather forecasters, which could create increased risks to public safety, infrastructure and property, and the economy;</li> <li>2. has a lack of integration between climate science, forecasting, hydrology and coastal hazards and therefore does not provide integrated weather forecasting advice;</li> <li>3. results in decisions that are not always informed by the latest information, leading to increasing risk;</li> <li>4. is inefficient and costly, as evidenced by duplicated effort and investment;</li> <li>5. results in opportunities for system improvements and technological developments being missed; and</li> <li>6. has data access and management arrangements that are restrictive and costly, and they limit innovation.</li> </ol> <p>Previous reviews in 2001, 2006 and 2018 also identified long-term risks associated with existing institutional arrangements.</p>	

Officials have considered the information, conclusions, and recommendations provided by Sapere, and the conclusions and recommendations of prior reviews, and these and other analyses are reflected in this preliminary RIS.

## Executive Summary

### Proposal

This preliminary RIS relates to the in-principle decision sought from the Cabinet Economic Policy Committee (ECO) by the Minister of Finance, Minister for State Owned Enterprises and Minister of Science, Innovation and Technology. The in-principle decision seeks Cabinet endorsement of further work on the following proposal.

*“That the National Institute of Water and Atmospheric Research Limited (NIWA) acquires the Meteorological Service of New Zealand Limited (MetService) initially as a wholly-owned subsidiary, and MetService being retained as a brand as New Zealand’s authorised meteorologist.”*

***This RIS is prepared on a preliminary basis as work on the proposal and its expected impacts is ongoing. Therefore, the information and analysis in this RIS reflects this stage of work. This RIS focuses only on the in-principle decision for NIWA to acquire 100 per cent of MetService at this point.***

In addition, officials note that policy work is underway on whether data access arrangements in the weather forecasting system also need to be amended. This has been identified by prior reviews, officials, and Sapere as an important element of the weather forecasting system. *This work is at an early stage and therefore not a part of this preliminary RIS.*

Legal professional privilege

### Options considered

Sapere considered a long-list of options in relation to funding, delivery and regulatory levers and how they would best position New Zealand to meet future weather-related needs and challenges. Five feasible options were then short-listed to for more detailed consideration. These short-listed options were:

- ***The status quo***: with the two entities operating as they do now.
- ***Option One: enhancements to the status quo*** to explicitly remove duplication, which would involve requesting that NIWA’s scope of services exclude services/functions that MetService is responsible for.
- ***Option Two: integrating NIWA and MetService alongside NIWA’s other functions involving NIWA acquiring MetService as a wholly-owned subsidiary.***
- ***Option Three: a new public weather service entity*** where the components of MetService and NIWA that fall under the weather forecasting system are placed into an entirely new entity with new governance and leadership.

- **Option Four: integrating weather forecasting system and natural hazards capabilities** which is an extension of Option Two to include hazards.
- **Option Five: integrating the weather forecasting capabilities with those held within NEMA** in relation to emergency management.

The short-listed options were assessed against a number of objectives or “principles” for an optimised system, which were derived from prior reviews, consultation from system stakeholders, and expertise and analysis. These principles are summarised later in this RIS.

**Option Two is officials’ and Sapere’s preferred option as this option is judged to best position New Zealand for future weather events and has the greatest net benefits of all the short-listed options.**

New Zealand’s future weather forecasting system needs to go beyond what existing arrangements are expected to deliver due to the increasing risks and demands of weather-related challenges and impacts in the context of climate change.

Officials consider that re-integration of meteorology services through the acquisition of MetService by NIWA will have a number of benefits, including:

- ensuring unified public weather warning messaging with ‘one authorised voice for severe weather communications and impacts’, which is more aligned to international norms;
- support a more coordinated response to any future severe weather events through better system integration (of data and information) which may help save lives, prevent damage to property and infrastructure, and reduce adverse impacts to the economy;
- provide efficiencies and cost benefits in terms of alignment of weather forecasting activities, investments and planning;
- be quicker to implement and involve less risk than is inherent in large contemporaneous structural reforms, while maintaining continuity of weather forecasting service provision; and
- Confidential advice to Government

Sapere estimated the net present value (NPV) of net monetised benefits for this option to be within a range of \$144.7 million to \$180.3 million. There would also likely be non-monetised benefits, although these are very difficult to quantify.

Note that this estimate does *not* take into account the costs of more open data access arrangements as further work is required on this and it is not a decision being sought at this time.

Officials consider Option Two achieves the greatest net benefits, can be implemented relatively quickly, and has the least amount of structural change and disruption to the weather forecasting system and service continuity risk. Confidential advice to Government

Confidential advice to Government

Officials concur with Sapere that non-structural change options (status quo and Option one) will not lead to an efficient, effective and fit for purpose weather forecasting system, and offer limited long-term benefits.

Confidential advice to Government

### Potential impacts of preferred option

In addition to the benefits noted above, the costs and risks from the proposal include:

- Restructuring costs, arising from staffing changes and professional advice (e.g. legal and commercial advice required to design and implement the proposal).
- Fiscal implications, Confidential advice to Government
- There is a risk of service interruption while the acquisition progresses, but this is considered small as NIWA and MetService would pace the timing of the acquisition to ensure continuity of service throughout the acquisition period.
- Risk of loss of capability. While individual staffing matters are for NIWA and MetService to determine, it is possible some capability would be lost in the short term if this best suited business needs and service provision.

The direct impacts will be to NIWA and MetService as they are the parties to the acquisition. There will likely be positive downstream impacts for customers as service delivery is improved over time as a result of a more coherent and integrated system operating more efficiently and at less cost. As noted above, if there are any staffing changes then those staff will be directly impacted. However, these issues are operational matters to be handled through employment contract provisions and employer-employee negotiations.

### Consultation

As part of the review, Sapere met with over fifty stakeholders involved in the weather forecasting system. Additionally, Sapere employed a survey in the review and received over 145 responses providing further input for consideration. This is in addition to the findings of consultations of previous reviews.

MetService and NIWA both recognise structural change is needed in the weather forecasting system. Both boards have indicated they will work constructively to implement the Government's decisions.

The Treasury and MBIE consulted on the short-listed options with the Department of Prime Minister and Cabinet (DPMC), the Ministry of Transport (MOT) and the Public Service Commission (PSC), who are supportive of the recommended option. While the National

Emergency Management Agency (NEMA) has indicated a preference for Option Four, NEMA supports Option Two as a step towards this. All of the above agencies have been consulted on the options briefing in which shareholding Ministers agreed to an in-principle decision on Option Two and the Cabinet paper proposing this.

## Limitations and Constraints on Analysis

### Limitations and constraints

The WFS Review was conducted in accordance with the publicly released Terms of Reference (ToR) found here: <https://www.mbie.govt.nz/science-and-technology/science-and-innovation/research-and-data/project-hau-nuku-weather-forecasting-system-review-terms-of-reference>

This link also provides access to previous officials' advice leading up to the ToR. The ToR encompassed problems raised in prior system reviews and matters officials have noted since the last review in 2018. In summary, the WFS Review focused on the following questions:

1. What are the optimal arrangements and responsibilities in the weather forecasting system that will best position New Zealand to meet future weather-related challenges and impacts in the context of climate change?
2. What are the optimal structural arrangements in the system, with respect to MetService and NIWA, based on the optimal system arrangements identified in point 1 above?
3. Should changes in access to weather data arrangements be made and, if so, what should these be?

While technically these are constraints, these questions are quite wide in ambit but were considered necessary to provide practical boundaries for the review to be conducted in a reasonable amount of time at an appropriate budget.

The scope of the review did **not** include other Crown companies or entities, the level of aggregate Crown funding and the monitoring arrangements for any new structural arrangements. The ToR also provides more detail on what the review would and would not focus on.

There are limitations in quantifying the financial implications and net monetary benefits of the in-principle proposal at this point, as the value of MetService's shares has yet to be determined and the potential restructuring costs (along with any transition costs) are difficult to determine at this early stage as policy work continues on implementation matters.

However, we note that, as at 30 June 2024, MetService's Board estimated the current commercial value of the Crown's investment in MetService to be in the range of \$51.8 million to \$62.3 million (the mid-point being \$57.1 million). This is per its most recent Statement of Corporate Intent but will need to be informed by an objective, updated valuation and the purchase negotiations.

The information used to calculate the NPV of the estimated net monetary benefits relies substantially on information by NIWA, MetService, and calculations and estimates performed by Sapere.

### Responsible Manager(s) (completed by relevant manager)

*Nicky Scott*

*Manager, Science, Innovation and Technology, Entity Performance and Monitoring  
Ministry of Business, Innovation and Employment*

*[Signature]*

*[Date signed out]*

### Quality Assurance (completed by QA panel)

Reviewing Agency:	Ministry of Business Innovation and Employment
Panel Assessment & Comment:	The panel's view is that the RIS meets requirements.

## Section 1: Diagnosing the policy problem

### What is the context behind the policy problem and how is the status quo expected to develop?

The significance of weather forecasting has grown substantially over time, driven by the increasing frequency, severity, and impacts of extreme weather events. Climate projections indicate a continued increase in extreme weather events in New Zealand, with heightened risks and impacts to people and safety, infrastructure, property and the economy. The links between the weather forecasting system and emergency management will become even more critical in terms of informing a timely and effective response to future weather events.

The recent WFS Review noted that public weather forecasting in New Zealand provides considerable net benefits to society, including for building and infrastructure and public safety. Due to its positive externalities and public good nature, there is a role for the government in ensuring the provision of public good weather forecasting, which the market is unwilling or unable to provide.

MetService is a State-owned enterprise (SOE) focused on forecasting and warnings services and NIWA is a Crown Research Institute (CRI) that undertakes ocean, atmospheric, hydrological, and climate research which also provides weather forecasting services.

SOEs are companies wholly-owned by the Crown that are expected to be as profitable and efficient as comparable businesses that are not Crown-owned. SOEs are also required to be good employers and to act in a socially responsible manner and are generally subject to the [State-Owned Enterprises Act 1986](#) (SOE Act) and the [Companies Act 1993](#) (CA1993). They are owned on behalf of the Crown by the Minister of Finance (MoF) and the Minister for State-Owned Enterprises who may provide input into the strategy of the entity through the Statement of Corporate Intent process. SOEs, such as MetService, are monitored by the Treasury on behalf of shareholding Ministers. However, they are run by independent Boards that are accountable for performance and are appointed by shareholding Ministers.



As a CRI, NIWA is governed under the Crown Research Institutes Act 1992 (CRI Act), the Crown Entities Act 2004 (CE Act), and the CA1993. The CRI Act provides that the purpose of a CRI is to undertake research for the benefit of New Zealand, pursuing excellence in all that it does, abiding by ethical standards and operating as a good employer. CRIs are expected to promote and facilitate the application of the results of research and technological developments. A CRI must do these things while remaining financially viable, generating an adequate rate of return on shareholders' funds, and exhibiting a sense of social responsibility. While CRIs will typically generate profits to achieve these ends, they are not expected to be profit-maximisers.

CRIs are owned, on behalf of the Crown, by the MoF and the Minister of Science, Innovation and Technology, who appoint their Boards. Boards are accountable for performance and are monitored primarily by MBIE, with the Treasury as secondary monitor. Shareholding Ministers may provide input into the strategy of the entity through the Statement of Corporate Intent process. If NIWA seeks to make a large investment (such as the purchase of assets or the shares of another company), it needs to first seek the approval of shareholding Ministers beforehand, although it will be responsible for the investment. Depending on the size and nature of the investment it may also need to meet the major transactions requirements of the CA1993 and possibly seek cabinet approval.

The current weather forecasting system is fragmented, with two separate and competing Crown-owned companies, leading to confusing public service weather forecasting messaging, inefficiencies and inconsistencies in service delivery, duplicate investments, and missed opportunities for technological developments. Further, the WFS Review found that New Zealand's future system needs to go beyond what existing arrangements are expected to deliver. This is discussed further below.

Despite a prior Memorandum of Understanding between NIWA and MetService, these problems have continued and the relationship between the two organisations has, at times, been both tense and duplicative. Based on the experience over the last 20 years the status quo will likely continue to result in competition between NIWA and MetService over weather forecasting activities.

## What is the policy problem or opportunity?

### Problems with Weather forecasting System

Officials set out below the following problems with the weather forecasting system. Many of these were discussed in the publicly released ToR for the WFS Review and further underlined by the work of the review.

#### ***Research-to-operations pathway is needed in the weather forecasting system***

##### *Benefits of providing public good weather forecasting*

Weather forecasting provides social, cultural, and economic benefits to society and it is an input to many of the goods and services we enjoy. For example, weather forecasting allows more informed farming decisions about sowing irrigation, fertilization, pesticide application, harvests, and drying processes. It also allows for safer travel (e.g. used by airlines and shipping to ensure timing and route selection). It is also used for simple, everyday activities such as when to hang clothes out to dry and whether to take an umbrella with you to work.

A weather forecasting system will likely involve a public good element. Sapere found that there is a role for government in ensuring the provision of a "public good" weather forecasting. This is because the private sector cannot capture the benefits from public good



investments and is therefore less willing to invest in providing it, resulting in a lower than socially optimal level of provision if left to the market. This is particularly so in markets involving large capital investments (e.g. extensive national weather and hydrological monitoring networks, access to complex weather prediction and downstream models, high performance computing technology, large data storage, and sensor technology), which create very high barriers to entry.

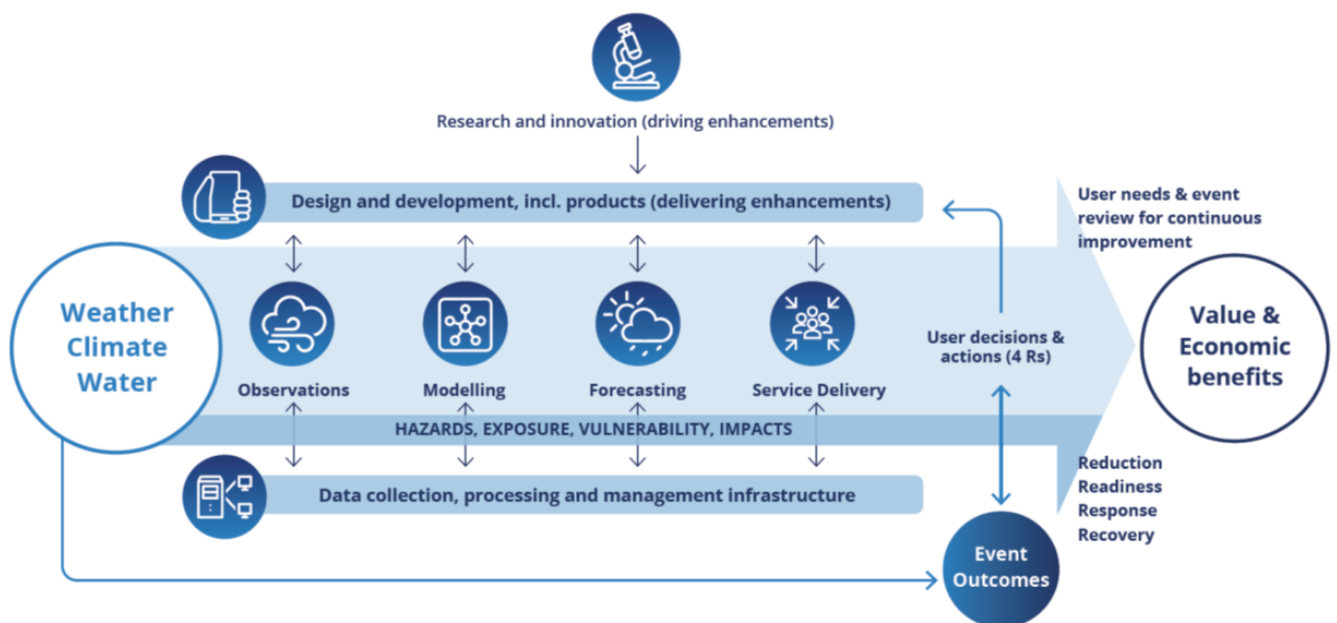
Sapere noted that research suggests public weather forecasting delivers considerable net benefits to society noting that these benefits can be a large multiple of cost.

Sapere also found that there is also a place for private actors in the weather forecasting system, especially where weather data and information can be packaged and delivered according to the specific needs and budgets of firms, communities, and individuals. In cases where the barriers to entry are not high, a level of competition in the delivery of downstream products and services can also provide societal benefits. An example of this might be in the insurance/re-insurance industry, where insurers use weather and hydrological data to estimate risks associated with natural hazards, resulting in the better allocation and pricing of risk (which could affect insurance premia for certain locations).

Research-to-operations pathway

Weather, hydrology and climate forecasting are used to produce products and applications, provide advice, and be communicated with the public and other stakeholders. Underpinning these processes is data infrastructure and research. Each process should inform research—thereby enabling research to flow back into the operational process to improve weather, hydrology and climate forecasts. This is known as *the research-to-operations pathway*. The pathway allows the progressive improvement of weather forecasting and other processes as better information is brought to bear over time in relation to the natural environment.

The diagram below<sup>1</sup> provides an overview of New Zealand’s weather and climate forecasting value chain:



<sup>1</sup> Source: MetService (2023)

Currently, there is no clear research-to-operations pathway to integrate the climate and weather research outputs produced by NIWA into operational weather forecasting undertaken by MetService.

Collaboration between NIWA and MetService under current institutional settings is challenging due to the mandates and requirements of each entity under their respective Acts, competitive tensions between the two, and the application of competition law. This is resulting in a lack of collaborative input into research to improve the accuracy of weather predictions and warnings therefore limiting the effectiveness of the forecasts and potentially resulting in reduced socioeconomic benefits.

The Crown provides funding to NIWA for weather forecasting research but there are no incentives to share research outcomes with MetService or any other weather researchers or forecasting providers. Under current institutional arrangements, both NIWA and MetService are incentivised to generate income from their activities, which is not always conducive to collaboration (even if collaboration did not create Commerce Act 1986 concerns). This lack of integration may create risks for public safety as information is withheld, restricted or charged for, where the information could have otherwise more freely flowed to inform communications on severe weather events.

Officials consider that we need a more connected weather forecasting system that allows a better integration between forecasting, hydrology, coastal hazards, and climate science. This will enable a more cohesive understanding of weather impacts and hazards and improve our planning for, and resilience to, severe weather events.

National weather forecasting systems should integrate processes and sub-systems that connect long-term climate science and research through to short-term forecasting and public communications - enabling effective decisions and actions across the nation. The processes should follow global standards and practices and rely heavily on observational data processed through atmospheric, ocean and earth systems models (and through advances such as the application of artificial intelligence and machine learning).

### ***Duplication, cost and efficiency***

NIWA and MetService have, over time, increasingly competed with one another over weather forecasting services. Sapere noted that NIWA started its weather division in 2013, coinciding with the launch of a public-facing weather forecasting website and that it competes with MetService for weather forecasting work.

In 2017 NIWA won the contract (held by MetService) to provide forecasting services to Fire and Emergency New Zealand (FENZ). Further, in 2020, NIWA won the contract (held by MetService) to provide the Department of Conservation's weather forecasting services. In 2014, MetService acquired a partial stake in MetOcean, a company focused on oceanography (which it later fully acquired in 2017).

As both entities are providing weather forecasting services the existing system results in an element of investment duplication, additional cost, and inefficiency, such as:

- The purchase of weather stations and weather observation equipment and sensors in the same areas by both NIWA and MetService.
- Staff both in NIWA and MetService generating weather forecasts for the same time periods and locations.

- Separate investment by both NIWA and MetService in facilities to house staff that provide weather forecasting activities (either through ownership or leasing arrangements) that could otherwise be combined, resulting in a lower combined facilities footprint. The status quo can therefore result in additional facilities costs and overheads to support them. This is exacerbated by the fact that both NIWA and MetService have, individually, been in the process of considering new facilities investments.

While it is difficult to put a dollar value on the cost associated with this duplicative investment, the examples above are clear the magnitude is likely to be unnecessarily high. The section summarising the marginal costs and benefits of the preferred option highlight an estimate of the net monetised benefits of the savings from a business combination.

### ***Conflicting narratives on weather forecasts could lead to Public Safety risk***

Implicit in the notion of ‘social contract’ is that government agencies will act in a way that support public safety. This is also the expectation on both NIWA and MetService. Clarity in public communications is therefore critically important to ensure clear and timely messaging is provided, especially in cases of severe weather. The World Meteorological Organisation (WMO) highlights the importance of the ‘single authoritative voice’ for public safety during hazardous weather events. However, as both NIWA and MetService provide communications on weather forecasts, that is not the case. This is compounded by the WMO recognising MetService as the nation’s official meteorological organisation and NIWA as the nation’s official hydrological organisation. Forecasting the impacts of severe weather events (such as flooding or storm surge) invariably requires a combination of meteorological and hydrological analysis and modelling.

MetService, in particular, has expressed concern that competition and media commentary from NIWA during severe weather events may increase risks to public safety through conflicting narratives on weather activity and impacts.

An example of this is the lack of coordination between NIWA and MetService, and differing narratives in respect of the significant flood and wave hazards, that resulted in damage to property in Wellington’s south coast between two events occurring in 2020 and 2021. The underlying system allowing conflicting narratives remains, and we consider this could give rise to public safety risks.

We consider that the risks of confusing or conflicting communications from two state-owned weather forecasters also extend to the protection of infrastructure and the economy. The WFS Review confirmed the importance of a single authoritative voice for public safety purposes and noted, as did prior reviews, that this the norm internationally.

Officials concur that a single authoritative voice is the best means of ensuring clarity in public weather forecasting messaging and will bring New Zealand into alignment with international practice.

### ***The weather forecasting system’s increasing importance given severe weather and climate change impacts***

Weather forecasting is becoming increasingly important given the impacts of severe weather and climate change. A connected and integrated weather forecasting system where intelligence between entities can be shared and effectively communicated to agencies and communities is critical to support emergency management agencies and communities in their decision-making during severe weather events. At present the system is fragmented and

does not result in seamless information and communication on climate science, forecasting, hydrology and coastal hazards transfers to those that need them.

Sapere noted that climate change is anticipated to result in more extreme weather in New Zealand, with increased risks and impacts of weather events. There are several drivers of need for a better weather forecasting system, including:

- increased weather events and the need for resilience given climate change.
- increased severity of those weather events and the increasing needs of emergency management (discussed in section 2.2 of Sapere's appended interim report).
- international stability risks and New Zealand's role in the Pacific.
- connections between hazards and reduced boundaries across sciences (floods, landslides, and weather-climate, etc).
- expanding demands for accurate and localised weather forecasts - for instance, management of energy demand and supply as renewable energy supply increases.

The Inquiry into the North Island Severe Weather Events (NISWE) found that New Zealand's emergency management system is not fit-for-purpose and there are some significant gaps we need to address. In particular, NISWE found that the system does not have the capacity or capability to deal with significant, widespread events that impact multiple regions concurrently. NISWE found the need for greater information sharing at the national and local levels and one of its recommendations included requiring timely and enhanced weather and hydrological forecasting to be provided to and used by all councils and government agencies.

The current separation of NIWA and MetService, and the requirements and incentives of the institutional arrangements under which they operate are, according to Sapere and a prior review, at the heart of the reasons why the existing system is as fragmented as it is and why it is unlikely to change under the settings of the status quo. This and a prior review have found that what is needed is a means to bring these functions and processes together in a way that allows for the integration referred to above.

### ***The system needs appropriate arrangements for access to weather data***

Existing access to weather data arrangements do not provide visibility or market discipline on whether data, products, or services are being appropriately given away, priced, charged for, or enabled via markets. Views on access to weather data are evolving in response to severe weather events, including NISWE, and due to climate change, and it is likely that in future greater importance will be placed on freely available, real time weather data.

One of NISWE's recommendations included endorsing the WFS Review to (among other matters) identify changes in access to weather data.

### **Sapere's review findings**

Sapere's interviews, surveying, workshops, and research highlighted several potential barriers to meeting future system needs and demands, stemming largely from the current institutional arrangements, which (among other things) lead to potential issues around the: efficiency and prioritisation of what is delivered from government spending; integration of information produced from that spending; and availability of information to support decision-making relating to the impacts of weather.

Sapere found that current institutional arrangements are associated with the following potential barriers to the system meeting future needs and demand in that it:

1. lacks integration between climate science, forecasting, hydrology and coastal hazards;
2. creates public uncertainty during severe weather events as a result of the inconsistent weather-related messaging arising under current institutional arrangements;
3. results in decisions that are not always informed by the latest information, leading to increasing risk to the public;
4. is inefficient, evident by duplicated effort and investment;
5. results in opportunities for system improvements being missed; and
6. has data access and management arrangements that are restrictive.

These are consistent with the findings of previous reviews and with officials' previous advice on the problems with the system.

### **Stakeholders affected by identified problems**

Affected stakeholders within the existing system are wide ranging, and include NIWA, MetService, NEMA, local councils, other weather forecasters, other government agencies and monitors, individuals, and firms that may be expected by severe weather events. More is provided within this RIS on stakeholder consultation. The WFS Review also sets out the views of consulted parties. They are generally supportive of the need to resolve institutional problems within the system.

## **Optimal weather forecasting system state sought**

The optimal state of the weather forecasting system that Sapere outlined is based on consultation with stakeholders, prior reviews, and their analysis. It can be summarised in terms of the expected future needs and demands of the system:

1. Access to global observations, modelling and capabilities with an increased coverage of the South Pacific.
2. Prioritised investment targeted at New Zealand's highest value and needs.
3. The ability to leverage computing capabilities, artificial intelligence and machine learning and increasing data to better understand and link with risks across hazards; impacts from weather events; and research, operations, applications and consumer demands.
4. Clear communications and engagement that are understood and trusted; accessible to relevant communities, and clear on actions needed from different parties.
5. Customer choice, input and engagement, and innovation products/application, and advice that is supported by open data access.
6. A changing role of the meteorologist, linking more with computer modelling and relevant environmental sciences.

As noted above these desired system outcomes have been informed by successive reviews, including the WFS Review.

## Section 2: Deciding upon an option to address the policy problem

### What criteria will be used to compare options to the status quo?

The shortlisted options noted above were assessed against the status quo using a number of principles. These principles were:

- **Optimising use of resources** including financial resources and different capabilities and inputs to deliver fit-for-purpose public forecasting services.
- **Improving understanding/prediction of impacts, risks and necessary actions** to drive effective planning and emergency response and management.
- **Reinforcing trust in the weather forecasting system** including providing one authoritative voice on severe weather communications and recognising the diverse needs of users.
- **Building strong international links and alliances** and supporting access to relevant global systems, data, infrastructure/models, and expertise.
- **Encouraging innovation** within the system including an openness to private competition and closeness to user demands.
- **Being realistic**, including the management of any transition and the level of disruption involved.

The extent to which each option demonstrated these principles was graded as was the extent to which each option met the optimal future system needs set out earlier above.

### What scope will options be considered within?

A long list of options was considered and from this a short-list of options was generated for more detailed analysis. The feasible short-list options were considered in the context of the optimal system state and the principles identified above. This is shown in more detail below.

We do not consider the scope of options has been unreasonably limited. As noted above WFS Review focused on determining the optimal future weather forecasting system and the optimal institutional arrangements within that system with respect to the two public weather forecasters, being NIWA and MetService. It also considered whether or not data access arrangements need to be changed. We consider this is an appropriate scope as informed by prior reviews of the system.

### What options are being considered?

A long list of options was considered against their ability to address identified potential barriers (stemming largely from the current institutional arrangements as discussed earlier above) to meeting future system needs and demands.



This longer list was as follows:

Options	Limited funding, prioritisation & duplication	Data access limitations	Complex links & collaboration issues
Restricting the ability to comment on weather warnings until after the warning period.	✓		
Removing weather forecasting from NIWA's scope of services.	✓		
Requiring open access to data and research that is publicly funded.		✓	
Splitting off NIWA's weather forecasting services (with access agreements to joint systems).	✓		
Merging the two organisations.	✓	?	?
Incorporating public weather forecasting under an existing department, such as NEMA, MBIE, MFE or MOT.	✓	✓	?
Procuring public good weather services (or observations and data services) from market & MetService potentially partially/fully privatised or existing entities being focused on research or value-added services.	✓	✓	?
Collaboration arrangements/agreements (e.g. MOUs, co-location).	✓?		✓
Joint ventures for non-public forecasting services.	✓?	?	
Natural monopoly regulatory arrangements for weather forecasting infrastructure.	✓	✓	?
Integrated hazard management with shared data & communication platforms.	?	✓	✓
International collaborations and/or mergers.	✓	✓	
Integrated local and central government purchasing of services.	✓	✓	✓
Complaints and/or disputes resolution processes for disputes over pricing or access.		✓	
Licensing or qualification requirements in order to provide weather forecasting services.	✓		

The vast majority of these were found to be entirely inadequate in terms of addressing the identified barriers (problems with the existing system).

From this longer list a short-list of feasible options was identified and considered in more detail (as discussed below). The RIS focuses on these (defined) shorter list options, and in particular, on the preferred option.

Across options 1 through 5, we would expect there would be coordination and prioritisation of funding for delivery of core weather forecasting services and warnings.

### **Option One – *Status Quo***

This option is the current situation as outlined earlier above. It is not considered tenable for the reasons outlined above, in the ToR to the review, and based on Sapere’s conclusions and recommendations in their final report.

We have considered non-structural enhancements to the status quo to remove duplication and found: underlying risks of the system would remain; minimal long-term benefits would be realised compared to the current arrangements; and that they would provide significantly fewer benefits when compared to structural change options.

MetService’s submission to the WFS Review also considered an enhanced status quo through legislative change concluding that structural change configured to meet future needs was required, and that an enhanced status quo could not deliver this.

Previous reviews in 2001, 2006 and 2018 identified long-term risks associated with existing institutional arrangements. Non-structural changes to improve collaboration between the entities failed. For example, in 2007 MetService and NIWA entered a Memorandum of Understanding, which failed to address these issues and has since been abandoned by both entities.

Taking into account these factors, officials concur with Sapere that non-structural change options will not lead to an efficient, effective and fit for purpose weather forecasting system, and that they offer limited long-term benefits. The status quo (or even a modified status quo) therefore are not considered tenable options, and experience has borne this out.

### **Option Two – *integrating NIWA and MetService involving NIWA acquiring MetService as a wholly-owned subsidiary***

This option involves NIWA acquiring 100 per cent of the shares of MetService, and MetService being retained as a brand as New Zealand’s authorised meteorologist.

This is the preferred option of both officials and Sapere. It is also consistent with the findings of a prior review for the bringing together of NIWA and MetService.

This option would likely include NIWA and MetService assessing the entities’ system requirements, retention of critical capability, the consolidation of weather monitoring equipment, and business continuity. MetService’s capability and responsibilities would be retained as a wholly-owned subsidiary, but duplicated functions would no longer be required. There would be the ability to draw on different capabilities and systems across the two organisations, and to coordinate communications and messaging.

The estimated monetised costs and benefits of this option (being the “preferred option”) are discussed further below.

### **Stakeholders affected by this option**

The stakeholders most directly affected would be NIWA and MetService, as parties to the acquisition that would be permitted under the proposal. However, we expect both direct and indirect benefits to flow to many parties from a more integrated weather forecasting system providing better information, including government agencies and private sector firms. This may be through more integrated and timely information on weather forecasts and impacts, and at lower cost through a lower cost structure and less investment duplication, and due to the synergies arising from the two organisations acting more collaboratively. We note that both NIWA and MetService are supportive of the preferred option (i.e. Option Two) and have agreed to work collaboratively together in the event Cabinet agrees to proceed.

Section 9 of the State-Owned Enterprises Act 1986 requires the Crown to act in a manner that is consistent with the principles of the Treaty of Waitangi. Legal professional privilege

It is too early to be specific about the magnitude and distribution of impacts across society of the proposal at this point, other than the estimate of net benefits discussed further below.

### **Option Three – a new public weather service entity encompassing weather forecasting elements of both NIWA and MetService**

This option involves the creation of an all-new public weather forecasting service entity that includes the components of MetService and NIWA that fall under the weather forecasting system.

This option would involve combining weather and climate capabilities, with the incorporation of hydrology and oceanography. This entity would be less commercial than an SOE which may impact its funding parameters in the event commercial income is unable to be replaced. This entity would be set up as a wholly Crown-owned Public Finance Act 1989 Schedule 4A company (PFASch4A).

While there would be a number of benefits similar to Option Two, this option would involve significantly more structural change, disruption, and cost as this option involves the creation of an entirely new entity within a different institutional framework than either NIWA or MetService is currently subject to.

It is difficult to see any significant additional benefits over Option Two relative to the risk, disruption, and cost involved in such a fundamental structural change. It would also likely take substantially longer to implement as all the relevant weather forecasting system assets and capability from both NIWA and MetService would need to be transferred to the new entity along with the sourcing of entirely new governance and management. This would be a more substantial exercise and create greater risk to service continuity. Consequently, officials do not prefer this option due to the relative risk, cost and time involved in implementing it given any marginal benefits that may arise relative to Option Two.

### **Option Four – integrating both capabilities in relation to the weather forecasting system as well as natural hazards capabilities**

This option involves integrating both NIWA's and MetService's capabilities in relation to the weather forecasting system as well as capabilities relating to other natural hazards. This would essentially be an extended version of Option Two and including the relevant hazard system elements of GNS. This could include the GeoNet capabilities and RiskScope as well as GNS's research and understanding in relation to impacts. The WFS Review noted that

this would be similar to the approach adopted in Japan. They also noted that this option was outside of the ToR for the review and therefore limited investigation of this option occurred.

While this option has merit in terms of joining up relevant parts of the wider system into the one entity, it would also come with greater risk, time, and cost relative to Option Two because of the scale of the restructure involved. Chief among risks is disruption to service continuity given the scale of change required during one restructure event. There would also be financial and operational impacts on GNS that would require addressing, which could create financial solvency issues for GNS.

Officials consider that Option Two is preferable to Option Four as it will help resolve identified weather forecasting system problems sooner, while preserving optionality for a future integration of elements of GNS at a later time Confidential advice to Government

Option Two will allow a less significant restructuring process and therefore be easier to manage while providing a stable entity group to be established before any more significant restructure takes place, if that is decided upon later. Officials consider this incremental approach to be less risky and less likely to result in service disruption while expediting the realisation of system benefits.

### ***Option Five – integrating the weather forecasting capabilities with those held within NEMA***

This option involves integrating the weather forecasting capabilities with the emergency management capabilities held within NEMA, the agency providing leadership in responding to, and recovering from, emergencies. This would involve the relevant weather and climate capability components as with Option Three, but instead sitting within NEMA. The expanded NEMA would be assigned the existing contracts and responsibilities of MetService and NIWA that fit within the weather forecasting system.

This option has the potential advantage of providing a more connected and holistic emergency management leadership role for NEMA, which could provide benefits particularly in severe weather emergencies. However, if the weather forecasting research functions remained with NIWA, the system would still be fragmented, which is one of the existing problematic system features the reform is trying to address in the weather forecasting system. Further, NEMA would not appear to have a competitive advantage in terms of performing weather forecasting and climate-related research activity relative to NIWA.

The WFS Review noted that this option was also outside of the TOR for the review and therefore had limited investigation.

### **Concluding comments**

We note that there are a range of organisational form options for options two, three and four, including a departmental agency, CRI or other Crown Entity company, Public Finance Act 1989 Schedule 4A company (PFAs4A), and an Autonomous Crown Entity.

Substantial further information in relation to GNS would be required to more fully assess Option Four and also in relation to NEMA for Option Five. Importantly, there are likely to be scale and capacity constraints at play. For example, the WFS Review noted that GNS had a headcount of around 507 (GNS Science, 2023) and NEMA of around 153 FTE (NEMA, 2023). This indicates the likelihood of significant challenges for NEMA in terms of taking on large capability complements from three other entities. NEMA did not support Option Five, among other reasons, due to the impact on its primary business for emergency response and

recovery activities and the lack of capacity and funding to absorb significant new roles and functions which could divert focus from its primary function.

Officials and Sapere discounted the option of setting up a new departmental agency under either MOT or MBIE on the basis that this would:

- involve many of the risks and problems of Option Three;
- not preserve the option for commercial operations and the financial incentives of a company model; and
- likely involve additional structuring costs.



How do the options compare to the status quo when considered against the features of the optimal system sought?

	Status Quo	Option 1: ESQ	Option 2: Integrate	Option 3: New	Option 4: Cross hazard focus	Option 5: Integrated with EM
<b>Optimises resource use, fit for purpose</b>	0	+ Through reducing direct overlaps, we expect an improvement in resource use through reduced duplication plus more coordinated purchasing. However, still likely to be less than optimal if coordination challenges remain.  Expect any reduction in market opportunities for NIWA (and any impact on its investments) to be offset by reduced friction in the market and more coordinated and longer term purchasing.	++ Expect to coordinate capability better in delivery and purchasing, risk may be in relation to efficiency without the same commercial incentive  Should improve efficiency, resilience, and potential long term to improve capability through integration.	++ Expect to coordinate capability better in delivery and purchasing, risk may be in relation to efficiency without commercial incentive. Whether it is able to take into account the needs of New Zealand more easily will depend on it not being an SOE.  Should improve efficiency, resilience, and potential long term to improve capability through integration.	++ Expect to coordinate capability better and allow broader skills to be applied, risk may be in relation to efficiency and internal coordination.  Should improve efficiency, resilience, and capability.	+ Through reducing direct overlaps, we expect an improvement in resource use through reduced duplication plus more coordinated purchasing.  Doesn't achieve as well as others as there may be too great a focus on emergency management rather than science and applications.
<b>Understanding of impacts, risks and actions and improved effectiveness</b>	0	+ Increased access and reduced direct competition as well as investments should support improvement.	++ Increased access and removed direct internal competition as well as investments should support improvement as well as bringing together broader key capabilities. Communications will need to clarify relevant roles/functions.			++ As with options 2-4, but with a risk in terms of focus beyond EM.
<b>Trust and social capital</b>	0	+ Improved clarity of voice would increase trust.	++ Increased ability to leverage different relationships and expertise; to channel and coordinate communications is expected to improve trust, social capital, and engagement.			++ As with options 2-4, but with a risk to independence of scientific expertise.
<b>International links</b>	0	0	+ Dealing with one organisation may simplify international relationships and enable these to be leveraged over different applications.			
<b>Innovation &amp; access</b>	0	+ There is a risk that with reduced publicly owned competition in weather forecasting that there is less innovation. We suggest this is likely to be more than offset by clarity of roles and flow-through to leveraging human capabilities and improved integration from research to operations.	++ There is a risk that with reduced publicly owned competition in weather forecasting and less commercial focus that there is less innovation. We suggest this is likely to be managed through focus on consumers, and data being available to private providers and offset by clarity of roles and greater agglomeration benefits and building of human capabilities.  The removal of significant competition within government and revised focus on public good, together with monitoring and investment cases should support this.			+ As with option 1 with some agglomeration, but potential for reduced focus on the science means not the extent of options 2-4.
<b>Practical</b>	0	0 It is assumed that committed services would not be impacted as these would be run through and re-tendered.	- There will be a level of organisational change and uncertainty during this period. While the change is realistic and possible, and service disruption should be manageable, there is some risk relative to the SQ short term.	- There will be a level of organisational change and uncertainty during this period. While the change is realistic and possible and service disruption should be manageable, there is some risk relative to the SQ short term.	- There will be a level of organisational change and uncertainty during this period. While the change is realistic and possible and service disruption should be manageable, there is greatest risk relative to the SQ in the short term.	- There will be a level of organisational change and uncertainty during this period. While the change is realistic and possible and service disruption should be manageable, there is greatest risk relative to the SQ in the short term.
<b>Overall assessment</b>	<b>0</b>	<b>4+</b>	<b>8+</b> (Potentially less disruption and greater integration across skills but risk of reduced access relative to option 3)	<b>8+</b> (Potentially more disruption but could be better access relative to option 2)	<b>8+</b> (Potentially most disruption but better access relative to option 2 and greatest access to skills and visibility across hazards)	<b>5+</b> Expect a number of improvements but a risk that applications beyond emergency management receive less attention

Scale: ++ much better than the status quo, + better than the status quo, 0 about the same as the status quo, - worse than the status quo, -- much worse than the status quo.

The table above shows Sapere’s qualitative assessment of options against the optimal system’s objectives, which was completed as part of the WFS Review. Sapere’s overall initial assessment is a finely balanced one where options two, three and four are the best choices among the five short-listed options. Officials generally agree with this qualitative assessment but consider that Option Two is faster to implement, has distinctively more advantages, and fewer risks and costs than the other options (see further below).

**What option is likely to best address the problems, meet the policy objectives, and deliver the highest net benefits?**

Option Two is MBIE’s, Treasury’s and Sapere’s preferred option. There is also support from DPMC, MOT and PSC.. While NEMA has indicated a preference for Option Four, it supports Option Two as a step towards this.

Combining NIWA and MetService could provide benefits in terms of the quality of research outputs and/or commercialisation of ideas, and reduced costs of collaborating. Research has suggested that there are significant benefits for researchers and firms undertaking similar activities in closer proximity<sup>2</sup>, but there is also evidence of positive externalities (i.e. spill over benefits) between researchers in different academic fields or commercial sectors.

Sapere estimated the NPV of net monetised benefits of Option Three to be within a range of \$67.5 million to \$91.7 million, which was far less than the estimated NPV of net monetised benefits of Option Two (see further below). Option Three also has a greater risk of service disruption and a longer timeframe to implement due to the more intensive activity resulting from the creation of an entirely new entity with new governance and management.

Sapere estimated the NPV of net monetised benefits for Option Two to be within a range of \$144.7 million to \$180.3 million. There would also likely be non-monetised benefits which are difficult to quantify (such as a more holistic and connected stakeholder engagement strategy). We note that this estimate does not take into account the costs of more open data access arrangements as further work is required on this and it is not a decision being sought at this time. It would be the subject of a later RIS if Ministers take that decision to Cabinet.

In the event Cabinet agrees to the proposal, any fiscal and appropriation implications of the acquisition would be set out in the coming months, once more policy and implementation detail has been worked through (e.g. following a valuation of MetService and preliminary purchase negotiations).

Officials consider Option Two achieves the greatest net monetised benefits, can be implemented relatively quickly compared to the other shortlisted options and with the least amount of cost, structural change and disruption to the weather forecasting system. This is particularly so if both entities undertake to work together to act consistently with the stated aims of the acquisition in the interim (i.e. while the legislation passes and the acquisition occurs), as they have both undertaken to shareholding Ministers to do.

Confidential advice to Government  
[Redacted text block]

<sup>2</sup> For example: Lee, Brownstein, Mills, & Kohane, 2010; Catalini, 2018; Mairesse & Turner, 2005; Siegel, Westhead, & Wright, 2003.



## What are the marginal costs and benefits of the preferred option?

A summary of the costs and benefits of the preferred option (i.e. Option Two) as noted by Sapere are set out below:

Affected groups	Comment	Impact (PV \$millions)	Evidence Certainty
<b>Direct benefits</b>			
MetService, NIWA and ultimately the Crown	Operating cost savings for MetService and NIWA	173.7 - 194.0	Medium
	Reduced collective capital investment needs and increased resilience from joint network and systems	0.6	Low
Customers and stakeholders	Reduced search, transaction and coordination costs for those using weather information	Medium	Low
<b>Total monetised benefits</b>		174.3 - 194.6	Medium
<b>Transition costs</b>			
Government/ NIWA and MetService	Detailed option design and change management	2.1 - 5.9	Low
	Moving, and other establishment costs	0.2 - 0.4	Low
	Changes in Legislation	0.1 - 0.3	Low
	Redundancies	1.2 - 1.8	Low
	Investments in systems	1.5 - 2.8	Medium
	Investment cases	0.7 - 1.4	Low
Deadweight loss	Deadweight loss accounts for the distortionary impact of activities funded by taxation	9.3 - 12.5	Medium
Total monetised costs		14.2 - 29.5	Low
Non-monetised costs		Low	Low
<b>NPV of Net Monetised Benefits</b>		<b>144.7 - 180.3</b>	<b>Low-Medium</b>

## Section 3: Delivering an option

### How will the new arrangements be implemented?

As section 11 of the State-Owned Enterprises Act 1986 (SOE Act) does not permit a shareholding Minister to sell or otherwise dispose of the shares of an SOE, MetService (being an SOE) will first need to be removed from the SOE Act, before any acquisition of its shares by NIWA would be permissible. Legal professional privilege

However, it is likely that other matters may arise as the work on implementation issues associated with this proposal progresses. These matters may require legislation, consultation, and/or specific processes to resolve. They could potentially include, for example, competition issues, superannuation issues, and the implications of section 9 of the SOEs Act in relation to the Treaty of Waitangi. If Cabinet agrees in-principle to the acquisition, work will progress on implementation matters and further advice will be provided to shareholding Ministers in the months to come.

At this point we consider there is a low risk that the matters noted above will be insurmountable problems. Legal professional privilege

Legal professional privilege

Legal professional privilege

Once the acquisition of MetService is legally permissible an acquisition process could progress. This process would involve, *inter alia*, NIWA performing a due diligence process in advance of any acquisition to understand the benefits, costs and risks, and following approval by NIWA's Board, a proposal could be made to shareholding Ministers for the acquisition of MetService's shares.

The purchase price and sale and purchase conditions will need to be worked through, but will likely flow from the due diligence process, a commercial valuation of MetService's shares, and a negotiation on the price for the acquisition.

While the decision to acquire MetService once legally permissible is ultimately a decision for NIWA's Board, we understand that NIWA is interested in pursuing the acquisition as they have a sound understanding of MetService's business, they see the synergies and efficiency benefits that could be achieved through greater integration, and of the additional value a business combination with MetService can provide to the wider weather forecasting system.

Work on the number and nature of potential implementation issues is underway and at this point we are not able to be more definitive. However, this is not unusual for a policy choice at a relatively early stage where Cabinet is being asked, in-principle, to allow further work to be undertaken by officials to develop it.

As noted above, further advice will be provided in the first half of 2025 on these matters in the event Cabinet agrees, in-principle, to the acquisition.

### **How will the new arrangements be monitored, evaluated, and reviewed?**

If Cabinet agrees, in-principle, to the proposal, Officials would be involved in advising on any policy issues that need addressing and on the drafting of legislation to achieve the implementation of the acquisition.

Officials would also be advising on any proposal by NIWA to acquire MetService once a due diligence and preliminary negotiations had concluded. At that point there will be a clearer picture of the full impacts and net benefits of the proposal and their magnitude.

If Cabinet agrees to the final proposal and associated implementation detail in the months to come officials would support Ministers in taking forward legislation through the House and in any other matters that require addressing (e.g. any consultation required).

The entity-monitoring and funding arrangements would also be determined as part the implementation detail to be worked through.