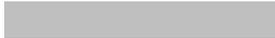


Reference: 20190692



31 October 2019



Thank you for your Official Information Act request. Your request was transferred to the Treasury on 25 September 2019. You requested:

“1. 20 August 2019 - Earthquake Commission and Treasury Briefing: Meeting with Munich Re Executives on 22 August 2019.”

Information being released

I have decided to release the relevant parts of this document subject to information being withheld under one or more of the following sections of the Official Information Act, as applicable:

- section 9(2)(ba)(i) – to protect information which is subject to an obligation of confidence or which any person has been or could be compelled to provide under the authority of any enactment, where the making available of the information would be likely to prejudice the supply of similar information, or information from the same source, and it is in the public interest that such information should continue to be supplied,
- section 9(2)(f)(iv) – to maintain the current constitutional conventions protecting the confidentiality of advice tendered by Ministers and officials,
- section 9(2)(i) – to enable a Minister of the Crown or any department or organisation holding the information to carry out, without prejudice or disadvantage, commercial activities,
- section 9(2)(k) – to prevent the disclosure of information for improper gain or improper advantage.

Direct dial phone numbers of officials have been redacted under section 9(2)(k) in order to reduce the possibility of staff being exposed to phishing and other scams. This is because information released under the OIA may end up in the public domain, for example, on websites including Treasury’s website.

1 The Terrace
PO Box 3724
Wellington 6140
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tel. +64-4-472-2733

<https://treasury.govt.nz>

In making my decision, I have considered the public interest considerations in section 9(1) of the Official Information Act.

Please note that this letter (with your personal details removed) and enclosed documents may be published on the Treasury website.

This reply addresses the information you requested. You have the right to ask the Ombudsman to investigate and review my decision.

Yours sincerely

Shelley Hollingsworth
Manager, Commercial Performance

OIA 20190692

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Earthquake Commission and Treasury Briefing: Meeting with Munich Re Executives on 22 August 2019

Date	20 August 2019	
Reference Number	BNR 18-19 020 T2019/2543	
EQC Priority	High	
Confidentiality Classification	Commercial in confidence	
Ministerial Action Sought	<p>Minister Responsible for the Earthquake Commission (Hon Grant Robertson)</p> <p>Action sought: Note the contents of this briefing</p> <p>Forward this briefing to your colleagues attending the meeting with Munich Re on 22 August 2019</p> <p>Deadline: Nil</p>	
Earthquake Commission Contact	<p>Sid Miller Chief Executive Earthquake Commission s9(2)(k)</p> <p>Primary contact: ✓</p>	<p>Robbie Taylor Acting Manager, Financial Market and International Treasury s9(2)(k)</p>
Enclosures	Munich Re Briefing Document: <i>Meeting with New Zealand Ministers Thursday, 22 August 2019</i>	

Briefing

Purpose

1. You are meeting with senior executives from Munich Re, a global reinsurer, on Thursday 22 August 2019. The meeting is an opportunity for Munich Re to provide you and your colleagues with its perspectives on the role of reinsurance, its view of New Zealand risk, including natural hazard and climate change risks and practical examples of insurance-linked solutions for public sector.
2. This paper provides you and your colleagues with Treasury and the Earthquake Commission's (EQC's) perspectives on a number of the points that are likely to be raised by Munich Re. In addition we have also provided you with a short summary of:
 - a. EQC's commercial relationship with Munich Re and its role as part of EQC's reinsurance programme;
 - b. EQC's reinsurance programme and the protection it provides to the Crown's balance sheet;
 - c. developments in the evolution of EQC's reinsurance programme; and
 - d. work being led by the Treasury examining the New Zealand property insurance market.
3. We have prepared a set of talking points (Appendix 1) and short biographies of Munich Re's senior executives (Appendix 2) to support you and your colleagues' engagement with Munich Re.
4. We have also attached a short briefing paper prepared by Munich Re in advance of the meeting.
5. During their visit to New Zealand Munich Re senior executives will also meet separately with officials from each of EQC, the Treasury and the Reserve Bank of New Zealand to discuss reinsurance.

Background

The Role of Insurance in a Comprehensive Risk Management Framework

6. Governments, businesses and individuals have a range of options open to them to manage the financial risk associated with specific events, including natural hazards. As noted in Munich Re's briefing note, there are some risks that are potentially too large to be retained by governments, business or individuals either due to the overall size or volatility of the risk. This includes large scale natural hazard events.
7. New Zealand's risk management framework is based on the "4 Rs" of resilience, readiness, response and recovery. In a direct manner, insurance and other forms of financial risk transfer form important components of the **readiness** for governments, businesses and individuals. As we have seen following the Canterbury and Kaikōura events, access to reinsurance payments in a prompt and timely manner is a critical component for recovery.
8. Indirectly, the analytical tools and techniques that are utilised by reinsurance markets to assess hazards and the ex-post financial risks they pose can also be utilised to assess the benefits of mitigation or adaptation measures as part of **resilience**, i.e., "a resilience dividend".

9. In its 2018 paper *The Contribution of Reinsurance Markets to Managing Catastrophe Risk*, the Organisation for Economic Co-operation and Development (OECD) recognises the role that reinsurance provides as a key form of funding to deal with volatility caused by natural peril events. The paper notes that, amongst other things, reinsurance contributes to risk management by:

- increasing primary insurance market capacity;
- managing catastrophe risk; and
- reducing economic disruption in the aftermath of catastrophe events.

Comment

Munich Re

10. Munich Re Group is a major global insurance and reinsurance business. Munich Re has been active in the New Zealand insurance market since the early 1970s and covers both the general and life insurance markets. Munich Re is a member of the Insurance Council of New Zealand and services its New Zealand market operations from its offices in Sydney where it has a staff of approximately 270.

11. In 2018 the overall group wrote premiums totalling \$84.8 billion (€49.1 billion), employed over 41,000 people and at 31 December 2018 had a market capitalisation of \$49.2 billion. With premium income of \$54.1 billion (€31.1 billion) from its reinsurance business, Munich Re is one of the world's leading reinsurers. Munich Re offers a full range of products, from traditional reinsurance to alternative, situation specific solutions for risk assumption.

Munich Re's Participation on EQC's Reinsurance Programme

12. Munich Re is a long term supporter of EQC's reinsurance programme. ^{s9(2)(i)}

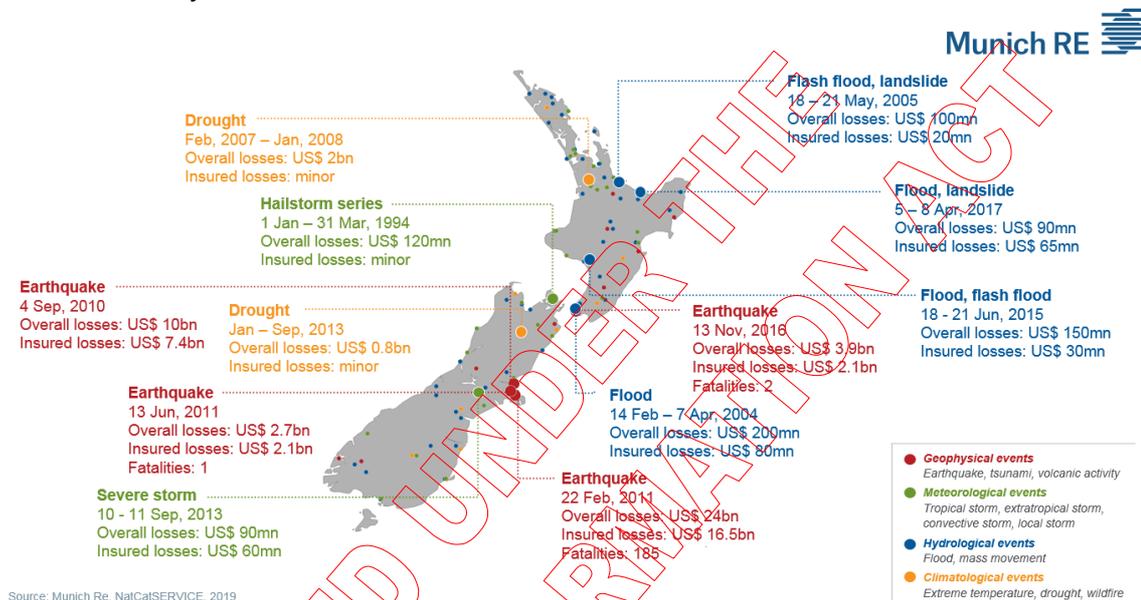
13.

Munich Re's Assessment of New Zealand Hazard Risk

14. Munich Re undertakes hazard and risk analysis and modelling utilising its in-house proprietary software and databases. Munich Re has estimated that 80 percent of New Zealand's natural hazard losses between 1980 and 2018 arose from earthquakes (Canterbury, Kaikōura, Seddon) with the remaining 20 percent from weather-related

events (storms, flooding and droughts). Munich Re estimates that since 2009 New Zealand has suffered economic losses from natural catastrophes totalling US\$43 billion with around US\$29 billion of these losses (62 percent) covered of EQC, private sector insurance and reinsurance.

Figure 1: Summary of New Zealand's Natural Hazard Losses since 1980



EQC's Risk Financing Strategy and its Reinsurance Programme

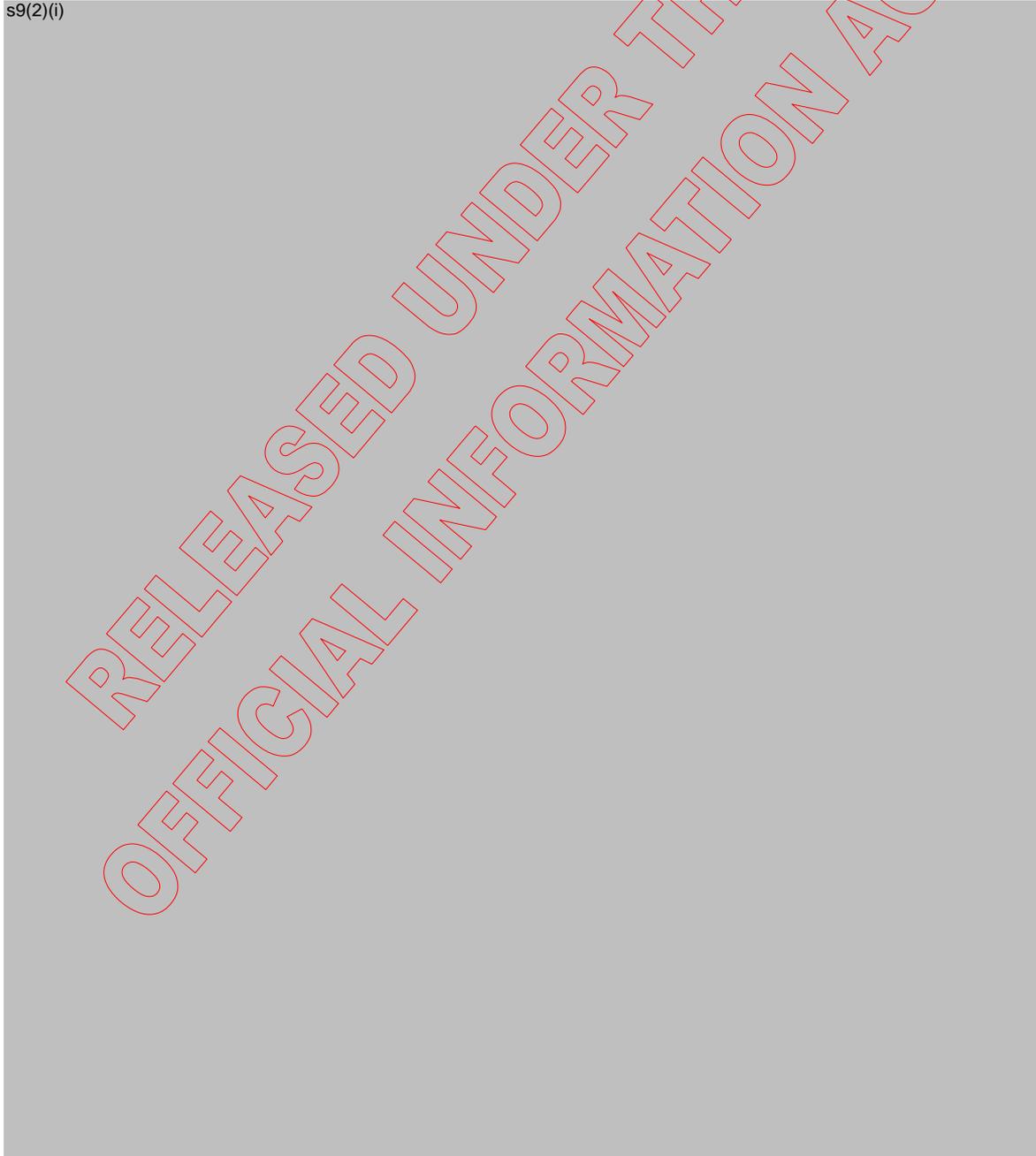
15. EQC's risk financing strategy is aimed at ensuring EQC has access to the necessary financial resources to meet the potential liabilities arising from the scheme and to support its remit to inform better management of New Zealand natural disaster risk.
16. EQC manages a significant proportion of its potential financial risk by purchasing reinsurance in the international insurance market. Reinsurance – insurance for insurers – enables insurance companies to share risk. Through its reinsurance programme, EQC transfers a proportion of the Crown's contingent liability to international financial markets. This means that additional financial resource is available to EQC for settling claims in the event of a major natural disaster.
17. Since 1988, reinsurance has been a core component of EQC's overall risk management strategy. EQC looks to balance a number of factors to ensure that its reinsurance programme:
 - a. takes account of the Crown's views on risk;
 - b. is affordable and provides value for money for the premium paid; and
 - c. is placed with counterparties that meet a high threshold for financial security.
18. The reinsurance programme has played a significant role in meeting the claims arising from the Canterbury earthquakes. As at the end of February 2019, EQC has received more than \$4 billion from its reinsurers which has in turn been used to settle Canterbury claims.
19. EQC's reinsurance programme has continued to successfully expand since the Canterbury earthquakes. EQC's reinsurance programme is made up of a number of

different layers of cover. Each layer is priced differently, based on the expected risk to the reinsurers. A number of EQC's reinsurers participate across multiple layers of the programme.

20. In the recently completed renewal for 2019/20, EQC has secured \$6.2 billion in reinsurance, an increase of \$640 million on the previous year. ^{s9(2)(i)}

The figure below provides a comparison between EQC's 2019/20 programme and the previous year.

s9(2)(i)



21. The continued renewal of EQC's reinsurance programme provides a clear signal of the confidence placed by the global reinsurance market in its understanding of New Zealand natural hazard risk.

22. A fundamental underpinning of this is the continued investment by EQC and others in high-quality applied research and modelling, including GeoNet, to better understand the impact of New Zealand natural hazards.

Developments in the evolution of EQC's reinsurance programme

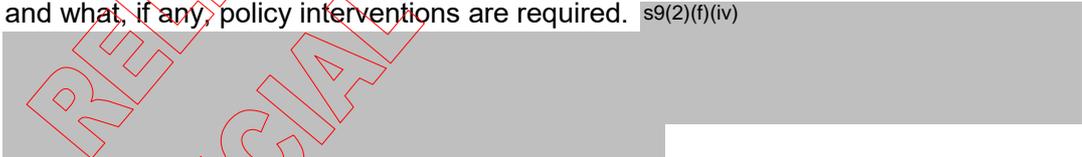
23. EQC has periodically looked at a range of different financing options that might be applicable for EQC or the wider Crown. These options have included **parametric insurance products**, including catastrophe bonds (cat bonds) and insurance linked securities (ILS). These are sometimes referred to as "alternative capital" as they are typically funded from a different pool of investors compared to EQC's traditional reinsurance products. These investors have provided substantial capital to support the development and placement of a range of parametric products.
24. Parametric products are designed with a simple trigger/threshold and pay-out based on measured physical phenomena (e.g., earthquake shaking intensity or rainfall over a certain period). The amount of loss paid for by a parametric product is not tied to the size or scale of the financial losses suffered by the policy holder, as is the case for EQC with its current reinsurance programme.
25. There is considerable flexibility in the design of the triggers for the insurance provided that can be customised to suit the needs of both parties involved. In addition, the types of perils being covered are also expanding. Natural hazard perils such as earthquake, flood and wildfire have been joined by terrorism, cyber and business interruption or economic losses from events.
26. EQC's broker, Aon, has estimated that in 2018 alone, \$9.5 billion of property-related catastrophe bonds were issued across 28 transactions. Notable purchasers of catastrophe bonds include the California Earthquake Authority, the Texas Windstorm Insurance Association and the Mexican government's natural hazard agency, FONDEN.
27. A key advantage of a parametric product is speed and certainty of payment, as there is no need for the policy holder or the finance provider to assess and quantify the financial losses suffered. Another benefit of parametric products is the diversification the capital sources and credit risks assumed by the Crown, away from traditional reinsurance markets.
28. A risk with this type of cover is that the clear definition of the covered parameters automatically introduces **basis risk**, as the potential exists for a financial loss to occur outside of scope of coverage, resulting in no payment or in a payment that falls substantially below the financial loss experienced.
29. As a result policy holders may be underinsured, this means that costs associated with actual loss may not be covered. This type of insurance scheme may not necessarily reduce the direct cost to customers, as the products are generally designed to provide a specific level of financial protection rather than reduce price.
30. As an example, at a recent Commonwealth Small States Conference in Apia, it was reported that following Cyclone Gita in 2018, Tonga received the maximum payout from

its parametric placement of US\$3.5 million,¹ whilst suffering losses of around US\$160 million.

Parametric insurance have a role in managing overall Crown risks

31. EQC's reinsurance programme remains the cornerstone of EQC's risk financing strategy. Parametric products such as cat bonds and ILS products could provide increased diversification from counterparty risk and provide additional capacity should constraints emerge in traditional reinsurance markets.
32. Parametric products could have wider applicability for the Crown when considering correlated risks to the Crown's balance sheet from natural hazards, such as the loss of overall economic productivity following a significant natural hazard event. However, this would only be the case if these instruments are more cost efficient than other risk management mechanisms, including self-insurance by the Crown.
33. For example, the Crown also protects against a wide range of fiscal shocks and risks by maintaining public debt at prudent levels, allowing headroom for borrowing in the event of a large natural disaster. The Treasury and EQC will continue to assess these products as part of the Crown's overall risk management framework.

Recent changes to New Zealand's property insurance markets

34. There have been a number of recent reports of issues with insurance pricing becoming unaffordable for some properties, and insurers being unwilling to insure some properties. Since the Canterbury earthquakes, risk modelling and our understanding about earthquake loss and damage has developed, including gaining a better understanding of the potential losses across different types of properties such as commercial, residential and mixed use buildings.
35. The Treasury is investigating pricing and access issues in property insurance markets and what, if any, policy interventions are required. s9(2)(f)(iv)

36. As part of this work, the Treasury will be seeking to gain a better understanding of the dynamics at play in the New Zealand property insurance market. This will include examining:
 - a. the commercial drivers of domestic insurers in specific property markets;
 - b. the impact of regulatory settings on the pricing and availability of insurance;
 - c. the impact of competition on specific subsections of the property insurance market; and
 - d. the availability and pricing of reinsurance to support the New Zealand insurance market.
37. As part of this work programme, officials from the Treasury, the Reserve Bank and EQC will be meeting with Munich Re senior executives ahead of the Ministerial meeting. We

¹ The placement was with the Pacific Catastrophe Risk Insurance Company (PCRIC), a World Bank-led initiative.

are looking forward to a set of constructive discussions to help shape further advice to the Minister of Finance.

Recommended Action

The Earthquake Commission and the Treasury recommend that you:

Note the contents of this report.

Noted

Forward a copy of this report to:

Forwarded

- Hon Dr Megan Woods
- Hon David Parker
- Hon Jenny Salesa
- Hon Kris Faafoi
- Hon Peeni Henare
- Hon James Shaw

Signature

Sid Miller
Chief Executive
Earthquake Commission

Signature

Robbie Taylor
Acting Manager
Treasury

Signature

Hon Grant Robertson
Minister Responsible for the Earthquake Commission

Date

RELEASED UNDER THE OFFICIAL INFORMATION ACT

APPENDIX 1: TALKING POINTS TO SUPPORT MINISTERIAL DISCUSSION

Understanding Munich Re's view of natural hazard risk and the availability of reinsurance

- Munich Re has been a significant and active participant in the EQC reinsurance programme and this support is very much valued by EQC and the New Zealand Government.
- The New Zealand Government values the critical role insurance plays for businesses and households to manage risk.
- Your briefing notes that hazard information systems can help educate the public about their individual exposure situation and are tools to help make informed decisions about prevention and risk reduction measures. How are these systems used to do this? What are examples of best practice from other countries?
- I am interested in understanding Munich Re's perspectives on the ongoing availability of reinsurance for New Zealand
- What do you see as the opportunities for or impediments to Munich Re taking on New Zealand risk.
- EQC invests in natural hazard research and modelling capabilities. From your perspective, when looking to assess New Zealand risks, how important is it for Munich Re to be able to source a credible local view of risk.

Understanding Munich Re's view of climate change risk and the role of reinsurance

- The New Zealand Government is taking an active approach to climate change. More than 15,000 New Zealanders and organisations have provided comment the Zero Carbon Bill, which looks to ensure we meet our 2015 Climate Change commitments by 2050.
- The availability and price of insurance and reinsurance is a key contributor to society making informed choices about investment decisions and risk mitigation around climate change.
- The Government is interested in understanding what Munich Re sees as the opportunities for the reinsurance industry to support countries like New Zealand in dealing with climate change.
- How is Munich Re taking climate change into account when making pricing decisions, and how will this affect which regions see a reduction in available coverage?

Understanding Munich Re's view of alternative capital products and their application to New Zealand

- Could cat bonds or parametric insurance assist private property owners to obtain more affordable insurance without the Crown being exposed to residual risk?

APPENDIX 2: BIOGRAPHICAL DETAILS OF MUNICH RE SENIOR EXECUTIVES

John Shewan, Chairman, Munich Re Australasia



Mr Shewan is an independent director operating in New Zealand and Australia, and an Adjunct Professor in the Business School at Victoria University of Wellington. He was Chairman of PwC New Zealand from 2003 to 2012, and a partner and staff member there for 35 years. During that time was heavily involved in tax policy and practice. He was awarded a CNZM in 2012 for services to business.

Ernst Rauch, Chief Climate & Geo Scientist, Munich Re Munich



Mr Rauch is responsible for the strategic positioning of Munich Re with respect to climate and natural catastrophes related topics. His work covers risk management solutions for climate and natural catastrophes risk and energy transition related technologies. Mr Rauch has worked for Munich Re for over 30 years. His work initially focused on earthquake risk analysis and the development of earthquake simulation models but since the 90s shifted to the analysis and modelling of meteorological risks. He has an MSc in Geophysics.

Dr Marcus Winter, Head of Central Division, Munich Re Munich



Dr Winter has worldwide responsibility for strategy, innovation, data analytics and targeted business development. He is currently based in Munich but has previously worked in Munich Re's Sydney office (2005-2008). Dr Winter has a PhD in Economics and Game Theory from Ulm University, Baden-Württemberg, Germany and an Executive MBA in Financial Services and Insurance from the University of St Gallen, Switzerland.

Scott Hawkins, Head of Non-Life, Munich Re Australasia



Scott Hawkins is the Head of Munich Re's Non-Life reinsurance business with responsibility for the Australasian region. This role encompasses Underwriting, Client Management, Claims and Data Analytics functions. Mr Hawkins has previously held several roles within Munich. Prior to joining Munich Re, Mr Hawkins worked in both direct insurance and reinsurance companies. He has a Master of Business (Finance) degree.

Briefing Document

Meeting with New Zealand Ministers Thursday, 22 August 2019

PARTICIPANTS

Grant Robertson	Minister for Finance, Sport and Recreation, EQC
Megan Woods	Minister Energy and Resources, Greater Christchurch Region, Housing, Research, Science and Innovation
Jenny Salesa	Minister for Building and Construction, Customs, Ethnic Communities
Kris Faafoi	Minister for Communications, Commerce and Consumer Affairs, Government Digital Services
James Shaw	Minister for Climate Change, Statistics
Peeni Henare	Minister for Civil Defense, Youth
Sir Michael Cullen	Chairman, EQC
Sid Miller	Chief Executive Officer, EQC
John Shewan	Chairman, Munich Re Australasia
Ernst Rauch	Global Head Climate & Public Sector Business Development Chief Climate & Geo Scientist, Munich Re Munich
Dr Marcus Winter	Head of Reinsurance Development, Munich Re Munich
Scott Hawkins	Head of Non-Life, Munich Re Australasia

Brief introduction Munich Re

The Munich Re Group was founded in Germany in 1880 and has been active in the New Zealand insurance market since the early 1970's. Munich Re is a leading reinsurer in Australasia and covers both the general and life insurance markets. The New Zealand market is serviced by the Sydney Office with a staff of approximately 270. The 2018 gross reinsurance premium income from the Life and Non-Life business serviced from Australia was A\$3,123 bn.

Our business model is based on the combination of primary insurance and reinsurance under one roof. We take on risks worldwide of every type and complexity, and our experience, financial strength, efficiency and first-class service make us the first choice for all matters relating to risk. Our client relationships are built on trust and cooperation.

Munich Re stands for exceptional solution-based expertise, consistent risk management, financial stability and client proximity. In the financial year 2018, Munich Re (Group) achieved a profit of €2,275m on premium income of €49.1bn. It operates in all lines of insurance, with more than 41,000 employees throughout the world.

Reinsurance

With premium income of €31.3bn from reinsurance alone, Munich Re is one of the world's leading reinsurers. We offer a full range of products, from traditional reinsurance to innovative solutions for risk assumption. Our core clients are both in the public and private sector domains: primary insurers, corporates, governments and supranational organizations. Especially when clients require solutions for complex risks, Munich Re is a much sought-after business partner. Our roughly 12,000 staff in reinsurance possess unique global and local knowledge. Munich Re attaches great importance to its client service, which regularly receives top ratings.

ERGO

Our primary insurance operations are mainly concentrated in the ERGO Group AG. Worldwide, the Group is represented in over 30 countries and concentrates on Europe and Asia. ERGO offers a comprehensive spectrum of insurance, provision and services. In Germany, ERGO Versicherung AG is one of Germany's largest providers of property and legal protection insurance. As a specialist in capital-market-oriented insurance, ERGO Vorsorge Lebensversicherung AG is shaping change in the area of private provision and biometric risk products. About 40,000 people work for the Group, either as salaried employees or as full-time self-employed sales representatives. In 2018, ERGO recorded a premium income of €17.8bn.

Asset management

MEAG is the asset manager of Munich Re and ERGO. With EUR 268bn assets under its management (31 March, 2019), MEAG is one of the world's major asset management companies. It manages all the main asset classes such as interest-bearing securities, equities, real estate, renewable energies and infrastructure. The quality of our asset management proved its worth during the recent financial crisis, which Munich Re weathered with continued financial strength.

In addition, MEAG also offers its expertise to private and institutional clients.

Role and principles of reinsurance

For governments, businesses and individuals there are some risks that are too large to be retained either due to the overall size of the risk or volatility of the risk. As an example governments diversify their funding by using not only local providers of funds but by using overseas providers of funds. Likewise Insurers use other forms of capital providers to fund their operations. This can take the form of the Capital Markets providing debt and equity or other forms of contingent capital.

Diversification plays a leading role in the management of volatility either in terms of funding diversification or the spreading of risks to reduce the likelihood of a severe loss depleting capital. The spreading of risk is fundamental to insurance as the losses of the few are spread across the many. The expected loss of any individual risk cannot be diversified (i.e. the annual expected loss remains the same regardless of how many parties share this). What can be diversified is the volatility of these losses over a defined period of time. The assuming of non-correlated risks is essential to create diversification whether this comes from pooling different types of risks or pooling of similar risks but from different geographies.

Reinsurance provides a key form of funding to deal with volatility caused by natural peril events. The OECD in their 2018 paper "The Contribution of Reinsurance Markets to Managing Catastrophe Risk" noted that reinsurance contributes to risk management in the following areas:

- Increasing primary insurance market capacity
- Managing catastrophe risk
- Reducing economic disruption in the aftermath of catastrophe events, and
- Reducing primary insurance market disruption from catastrophe events
- Enabling insurers to expand premium volume beyond their normal capabilities

I. Managing natural catastrophe risk in New Zealand

Munich Re's experience with geophysical and weather-related risks in New Zealand

1. Risk identification and risk measuring

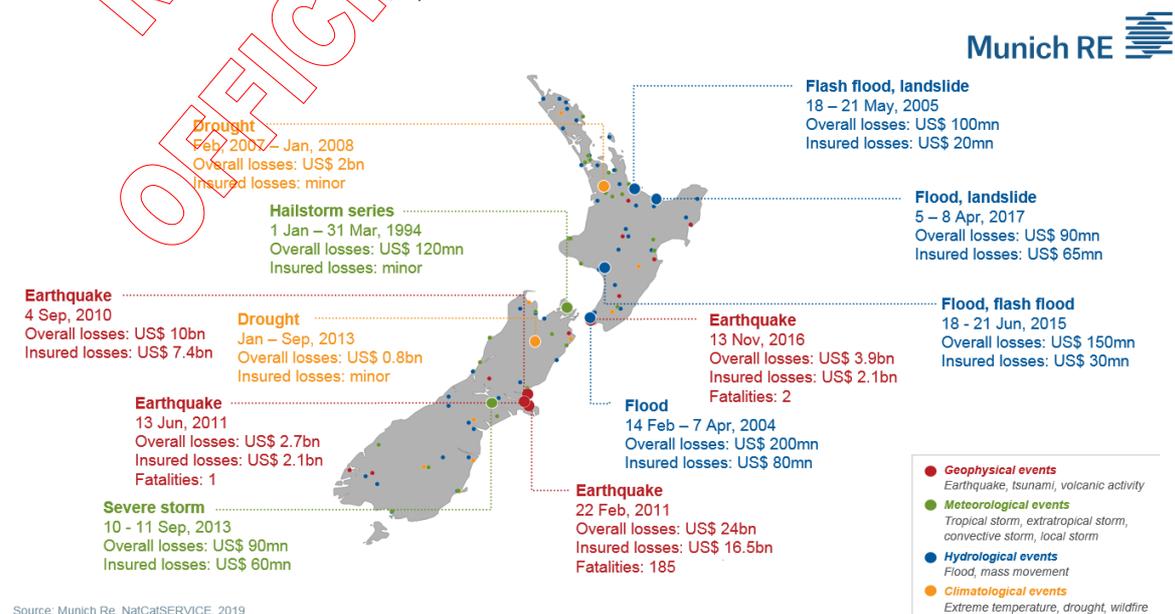
Hazard and risk analysis for individual locations based on Munich Re's proprietary NATHAN (natural hazard assessment network) software and NatCatService loss database

s9(2)(ba)(i)



2. Risk transfer

Relevant natural catastrophe events 1980-2018 (overall losses and insured losses: Munich Re NatCatService loss database).



The map above shows relevant natural catastrophes that have occurred in NZ since 1980: 5 events with overall losses > US\$ 1bn and 2 events > US\$ 10bn

In the period 1980-2018, 80% of losses from natural catastrophe events that have occurred in New Zealand were caused by earthquakes. The remaining 20% were caused by weather-related events: tropical storms, extratropical storms, convective storms, local storms, flooding, and droughts.

The total economic losses from natural catastrophes in NZ during the last 10 years (2009-2018) amounted to US\$ 43bn (annual average: US\$ 4.3bn). During the same period US\$ 29bn of these losses (67%) were paid through a combination of the EQC and private sector insurance and reinsurance companies.

Private insurers and the EQC have used reinsurance as a means of reducing the volatility of the Earthquake risk faced by New Zealanders.

Compiling data from the Insurance Council of New Zealand's Insurance Statistics for Earthquake shows that since 2000 (the 19 years to March 2019) insurers have:

- Received premiums of NZ\$6.7bn from Policyholders
- Paid to Reinsurers premiums of NZ\$4.0bn
- Incurred claims from Policyholders of NZ\$24.6bn
- Recovered from Reinsurers claims of NZ\$21.1bn

The Net Cost (before their expenses) to New Zealand insurers has been NZ\$1bn. Global reinsurers have provided a Net recovery of NZ\$17.1bn. Reinsurance has been an effective economic stabilizer.

If the large Earthquake Risks faced by New Zealanders were fully retained within New Zealand this increased volatility would require additional capital to be held by the Nation's people, businesses, insurers and Government. The cost of this capital would need to be funded by the economy which in turn reduces economic activity and growth.

Natural Catastrophes Events as drivers of fiscal risk

The role of reinsurance in ensuring sustainability

The four dimensions of fiscal risk:

	Damages	Losses
Public Assets	If uninsured: Property, Content & Infrastructure (Reconstruction & Replacement)	Recovery
Private Assets Personal, Commercial and Industrial	If state backed: Property, Content & Infrastructure (Reconstruction & Replacement)	Relief Payments Social Transfers Economic support Reduced Income

Source: World Bank Sovereign Climate and Disaster Risk Pooling, World Bank & OECD Fiscal Resilience to Natural Disasters, Munich Re

We identify four dimensions of natural catastrophes translating into fiscal risk by differentiating between damages and losses and between public and private assets.

- Damages = replacement value of physical assets
- Losses = foregone economic flows

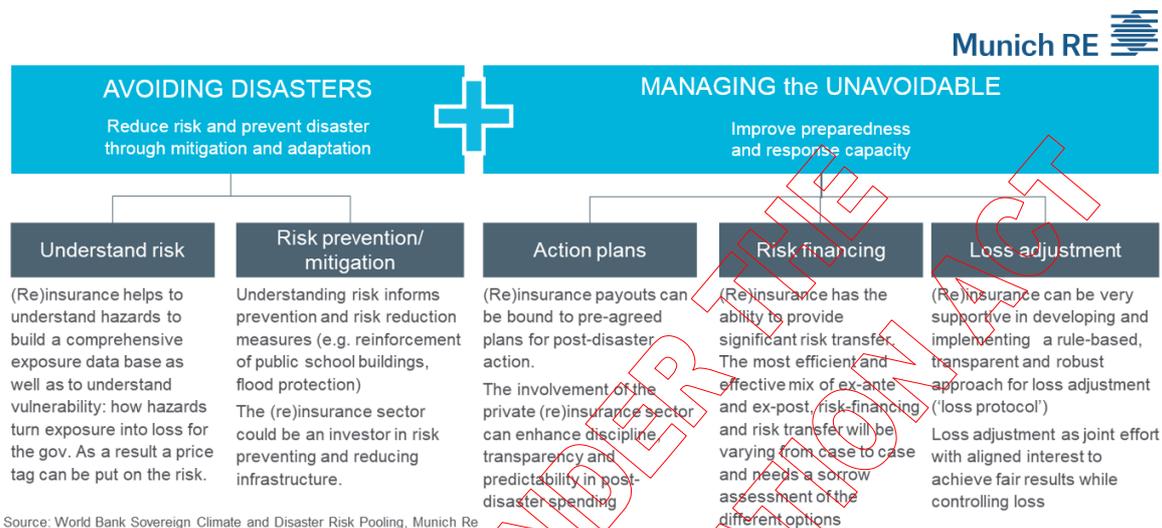
Damages and losses due to natural catastrophes represent contingent liabilities and income reductions and consequently pose a fiscal risk to sovereign and sub-sovereign governments.

Uninsured public assets, including major infrastructure such as water, electricity, schools and health facilities will typically be reconstructed using government funds.

Private assets also result in contingent liabilities if explicit (or also implicit) government guarantees are in place or if a government feels obliged to bail out affected households and enterprises.

Losses include relief payments to affected people, unemployment support, debt or tax relief. . If a natural catastrophe occurs in a community with limited resilience, further losses from a downturn of the economy and reduced tax income can occur.

Embedding insurance into an integrated disaster risk management approach and the value proposition of insurance



The Government and the private sector each play key roles in managing disaster risks in a comprehensive manner:

1. avoiding disasters, i.e. reducing risks and preventing disasters through mitigation and adaptation and
2. managing the "unavoidable" by improving preparedness and response capacity.

Avoiding disasters requires a thorough understanding of the risk. The insurance sector has developed for this purpose hazard information systems and probabilistic risk models. The later are simulation models to determine the expected average annual loss and probable maximum loss by calculating probabilities of certain perils as well as their impact (geophysical and hydro-meteorological) on a given exposure (e.g. public asset stock) by taking their individual damage-vulnerability into account. The expected average annual loss of a given exposure acts as the base line for calculating the risk premium.

Hazard information systems (e.g. Munich Re's NATHAN geographical information tool) provide for any given location data on earthquake intensity probabilities, flood zones and probabilities of other natural perils. Such digital systems can equally help educating the public about their individual exposure situation and are tools to help making informed decisions about prevention and risk reduction measures.

Managing the unavoidable entails the availability and implementation capacity of action plans, loss adjustment and also planning the financing for the implementation of action plans to cover the reconstruction of damaged assets and other losses such as the reduction in Crown revenue due to lower tax revenue. To organize ex-ante the necessary financial capacity to be able to respond to disasters is central to the value proposition of the international (re)insurance industry.

This value proposition goes far beyond the risk financing. It also helps to understand risk, and motivate prevention and reduction by putting a price tag on risks. The risk management expertise of the insurance industry can support governments to assess overall loss costs from potential natural disasters to take appropriate political and fiscal budget measures to manage the rapid reconstruction of destroyed assets.

Examples of Governments in different countries / regions addressing the fiscal risk by applying different strategies



Internationally, a number of insurance strategies can be observed to have been used to respond to the different dimensions of fiscal risk. The selection of the insurance strategy is driven by political priorities.

Example 1: Mexico – FONDEN (Fondo Nacional de Desastres Naturales)

In **Mexico** the government is focusing on protecting its public assets stock in order to reduce the adverse fiscal impact of natural disasters. However, the government supports FONDEN also as a means to enhance the efficiency of the loss adjustment by cooperating with the private sector. Hence not only the risk financing but also good governance in loss adjustment are the priority of the Mexican government.

To ex-ante finance the emergency response and relief costs of the Mexican government in the case of a major natural disaster, Mexico has issued with the support of the World Bank a catastrophe bond. Triggers are the intensity of hurricanes making landfall or the intensity of

earthquakes in predefined geographical areas. Capacity for quake and tropical cyclones in Mexico is tight from an insurance / reinsurance perspective and is coming hence at a price. Using international capital markets can be a way to access cheaper capital from investors not facing any accumulation of disaster risk as insurers do. Such a solution could be equally considered for New Zealand. Munich Re could support the New Zealand Government (e.g. Treasury) as a structurer of a capital market transaction (cat bond) and/or reinsurer of a tailor-made NZ specific solution.

FONDEN = Mexico's natural disaster program

- **Comprehensive risk management approach** beyond risk financing, incl. prevention and loss control
- **Dedicated fixed federal budget** (regularly review of objectives and whether program meets those)
- **Significantly reduction of loss costs due to improved governance in claims management**

Overview of risk transfer approach

- **Combination of indemnity and parametric solutions**
- **Insured assets (> US\$ 250bn):** Roads, bridge, schools, hospitals, low income households, water installation / infrastructure points
- **Insured risks:**

Geophysical	Weather-related
Avalanche, volcanic eruption, collapse, seaquake, landslide, tsunami, earthquake, subsidence	Severe hailstorm, hurricane, tropical storm, tornado, rainwater flood, river flood, severe rain, severe snow, severe drought, forest fire

Munich Re acts as reinsurer (contributed to structuring the program, incl. premium calculation, contract wording and claims management) and acts on behalf of World Bank as arranger of cat bond

Source: Munich Re

Example 2: Parametric Earthquake Solution Californian Public Entity

In California a regional government had the objective to strengthen its response capacity by accessing quick liquidity to cover disaster management related costs. The solution: a “cat in the box” parametric earthquake trigger with payouts depending on the magnitude and location (“box”) of the event and a three-tier payout structure. In order to have a sufficient correlation with losses incurred (often requested by regulators to be considered an insurance and not a derivative product) the insurance contract was supplemented by a secondary “proof of loss” trigger.

Client motivation / pain points

Public entity exposed to earthquakes:

- harming property
- additional disaster management costs
- need to meet civil obligations

Parametric trigger solution

Insurance contract with a double trigger:

- parametric trigger (eq magnitude within a predefined geographical box) for a three-tier payout structure (30% / 60% / 100%)
- proof of loss by the public entity (within 365 days after the event)

General challenges / lessons learned / success factors

Disaster relief despite „proof of loss“ clause:

- Munich Re pays out immediately on basis of parametric trigger; proof of loss can be provided later by client

Munich Re has the knowledge, experience and financial capacity to deliver such a solution

Example 3: UK – Flood Re

In the **UK** the penetration of flood insurance among residential property is historically very high. Some years back the insurance sector became more cautious in insuring flood risks in certain highly exposed geographies in the UK. As a solution Flood Re – a UK insurance industry owned and UK Government sponsored insurance scheme - was set-up as an entity financed by a levy and premiums from the property insurance policies throughout the country. The levy is used to cross subsidize the premium levels in highly exposed areas, thus keeping insurance affordable for residential property in that area. A similar approach could be taken for insuring commercial property against losses stemming from earthquakes in the most exposed areas in New Zealand.



Example of a Public Private Partnership to improve affordability of nat cat insurance

Potential Options for the New Zealand Government addressing fiscal risk and affordability of insurance

1. Focus on a pure parametric solution to cover public assets and disaster management costs

Similar to example #2 (parametric earthquake solution Californian public entity): protecting public assets and fiscal stability through a “cat in the box” solution with payout depending on earthquake parameters and identified financial obligations.

- ➔ inventory of public (and private) assets and assessment of disaster management costs / social protection needs
- ➔ definition of parametric trigger(s) and analysis of trigger probabilities

2. Focus on a more holistic risk financing and management solution

Similar to example #1 (Mexico/FONDEN): protecting public assets and fiscal stability and increasing efficiency of loss adjustment and emergency response. Requires an in-depth and long-term approach towards public-private cooperation.

- ➔ inventory of public assets and development of a comprehensive risk management approach
- ➔ combination of indemnity and parametric payout

II: Tackling Climate Change by enabling 100% electricity from renewable energies in New Zealand

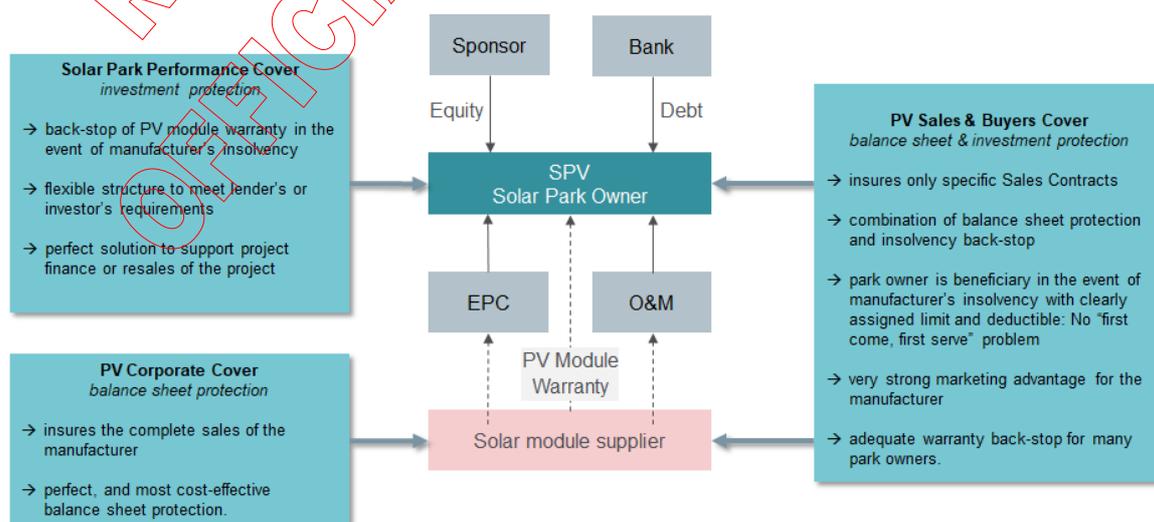
Munich Re’s expertise and solutions improving bankability and investability of new green technologies

A dedicated team of technology and risk management experts with Munich Re develops and underwrites new risk transfer solutions for green technologies. Our ambition is to enable banks, lenders and financial institutions to engage in new technologies by mitigating the long term performance risk.

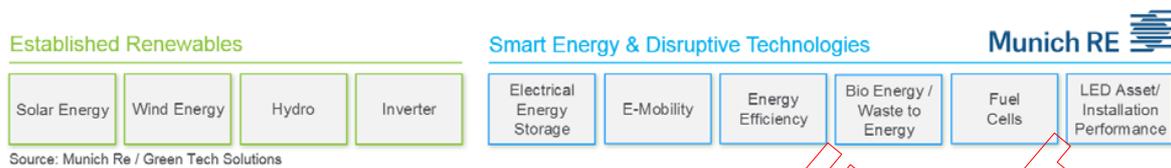
Within the last 10 years, we have successfully introduced several covers to the market in order to protect the long term investment in Wind, Storage Fuel Cell or Waste to Energy technology to name a few.

Example: Solar energy (photovoltaic modules) long-term performance warranty

In Photovoltaic for example, Munich Re protects the module performance up to 25 years – as a balance sheet protection for the manufacturer as well as an investment protection for the owner in case the manufacturer becomes insolvent and the warranty disappears.



Other innovative risk management solutions for green technologies:



Our enabling solutions create value on various aspects and help our insured to increase new technology deployment. Making investments more stable, releasing warranty reserves, attracting conservative investors or improving financing situations have been proven in the market.

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