TE KAUNIHERA Ā ROHE O WHAKAAHURANGI
STRATFORD DISTRICT COUNCIL

Our reference
F19/13/03-D21/26182

8 March 2023

Audit and Risk Committee and Ordinary Meeting of Council

Notice is hereby given that the Audit and Risk Committee and Ordinary Meeting of Council will be held in the **Council Chambers, Stratford District Council, 63 Miranda Street, Stratford** on ***Tuesday 14 March 2023*** beginning at 1.00pm.

Timetable for 14 March 2023 as follows:

10.00am	Section 17a Review Group
1.00pm	Audit and Risk Committee
2.45pm	Afternoon tea for Councillors
3.00pm	Public Forum - Judy Drummond, Stratford Croquet Club - Taranaki Trails Trust – Dave Taylor, Charlotte Littlewood and Darryl Gaudin
3.30pm	Ordinary Meeting of Council
4.30pm (approx.)	Workshop for Councillors - Annual Plan

Yours faithfully

Sven Hanne
Chief Executive

2023 - Agenda - Audit and Risk - March

14 March 2023 01:00 PM

Agenda Topic — Page

AGENDA
Audit and Risk Committee

TE KAUNIHERA Ā ROHE O WHAKAAHURANGI
STRATFORD DISTRICT COUNCIL

F22/55/05 – D22/46131

Date: Tuesday 14 March 2023 at 1.00PM
Venue: Council Chambers, 63 Miranda Street, Stratford

1. Welcome

1.1 Opening Karakia
D21/40748 Page 7

1.2 Health and Safety Message
D21/26210 Page 8

2. Apologies

3. Announcements

4. Declarations of members interest

Elected members to declare any real or perceived conflicts of interest relating to items on this agenda.

5. Attendance Schedule

Page 9

Attendance schedule for Audit and Risk Committee meetings.

6. Programme of Works

D21/42807 Page 10

Recommendation

THAT the Audit and Risk Committee's rolling programme of works up to the end of 2023 be received.

/
Moved/Seconded

7. Confirmation of Minutes

7.1 Audit and Risk Committee – 6 December 2022
D22/47533 Page 11

Recommendation

THAT the minutes of the Audit and Risk Meeting of Council held on Tuesday 6 December 2022 be confirmed as a true and accurate record.

/
Moved/Seconded

8. Matters Outstanding

D18/27474 Page 19

Recommendation

THAT the matters outstanding be received.

/
Moved/Seconded

9. Information Report – Health and Safety

D23/7845 Page 20

Recommendation

THAT the report be received.

/
Moved/Seconded

10. Information Report – Internal Audit 2021/22 – Update

D23/7299 Page 24

Recommendation

THAT the report be received.

Recommended Reason
The Audit and Risk Committee is tasked with reviewing and monitoring the internal audit activities of Council on behalf of elected members.

/
Moved/Seconded

11. Information Report – Capital Works Programme – Key Projects Update – February 2023

D23/6964 Page 34

Recommendation

THAT the report be received.

Recommended Reason
To present an update on the progress of our key capital projects in the 2022/23 financial year.

/
Moved/Seconded

12. Information Report – Annual Plan Update

D23/7919 Page 43

Recommendation

THAT the report be received.

Recommended Reason
This report provides the Committee with an update on the status of the draft Annual Plan 2023/24, and an opportunity to comment on associated risks.

_______/_______
Moved/Seconded

13. Information Report – Section 17a Reviews

D22/45421 Page 49

Recommendation

THAT the report be received.

Recommended Reason
To give an update to the Committee on the status of the Service Delivery (Section 17a) Reviews.

_______/_______
Moved/Seconded

14. Information Report – Risk Management

D23/8365 Page 63

Recommendation

THAT the report be received.

Recommended Reason
To provide an update to the Audit and Risk Committee of any significant risks and any incidents or threats in relation to significant risks on Council's risk register from the previous quarter.

_______/_______
Moved/Seconded

15. Correspondence

15.1 LGFA Half Yearly Report
15.2 LGFA Statement of Intent

16. General Business

17. Questions

18. Closing karakia

D21/40748 Page 220

TE KAUNIHERA Ā ROHE O WHAKAAHURANGI
STRATFORD DISTRICT COUNCIL

Our reference
F19/13/03-D21/40748

Karakia

Kia uruuru mai	I draw in (to my being)
Ā hauora	The reviving essence
Ā haukaha	The strengthening essence
Ā haumāia	The essence of courage
Ki runga, Ki raro	Above, Below
Ki roto, Ki waho	Within, Around
Rire rire hau Paimārire	Let there be peace.

63 Miranda Street, PO Box 320, Stratford 4352
Phone. 06 765 6099 | stratford.govt.nz

TE KAUNIHERA Ā ROHE O
WHAKAAHURANGI
STRATFORD
DISTRICT COUNCIL

Our reference
F19/13/03-D22/17082

Health and Safety Message

In the event of an emergency, unless guided to an alternative route by staff, please exit through the main entrance. Once outside the building please move towards the War Memorial Centre congregating on the lawn area outside the front of the council building.

If there is an earthquake, please drop, cover and hold where possible. Remain indoors until the shaking stops and you are sure it is safe to exit or remain where you are until further instruction is given.

Stratford District
In the heart of Taranaki

63 Miranda Street, PO Box 320, Stratford 4352
Phone. 06 765 6099 | stratford.govt.nz

5. Attendance schedule for 2022/23 Audit and Risk Committee meetings.

Date	14/03/23	16/05/23	18/7/23	19/09/23	21/11/23
Meeting	**A**	**A**	**A**	**A**	**A**
Neil Volzke					
Steve Beck					
Grant Boyde					
Annette Dudley					
Jono Erwood					
Ellen Hall					
Amanda Harris					
Vaughan Jones					
Min McKay					
John Sandford					
Clive Tongaawhikau					
Mathew Watt					
Philip Jones (External Chair)					

Key	
A	**Audit and Risk Meeting**
D	**Meeting deferred**
	Non-committee member
✓	**Attended**
A	**Apology/Leave of Absence**
AB	**Absent**
S	**Sick**
(AV)	**Meeting held, or attended by, Audio Visual Link**

Audit and Risk Committee - Programme of Works (D21/42807)

	Mar-23	May-23	Jul-23	Sep-23	Dec-23	Mar-24	May-24	Jul-24
Standing Items	-Correspondence Received -Health and Safety Report -Risk Management Review - LTP Capital Projects status update	-Auditor Correspondence Received -Health and Safety Report -Risk Management Review - LTP Capital Projects status update	-Auditor Correspondence Received -Health and Safety Report -Risk Management Review -Audit matters raised - Deloitte - LTP Capital Projects status update	-Auditor Correspondence Received -Health and Safety Report -Risk Management Review - LTP Capital Projects status update	-Auditor Correspondence Received -Health and Safety Report -Risk Management Review -Audit matters raised - Deloitte - LTP Capital Projects status update	-Auditor Correspondence Received -Health and Safety Report -Risk Management Review -Financial Report -Audit matters raised - Deloitte - LTP Capital Projects status update	-Auditor Correspondence Received -Health and Safety Report -Risk Management Review -Financial Report -Audit matters raised - Deloitte - LTP Capital Projects status update	-Auditor Correspondence Received -Health and Safety Report -Risk Management Review -Financial Report -Audit matters raised - Deloitte - LTP Capital Projects status update
Annual Items	- Internal Audit 2021/22 update - Annual Plan 2023/24 update	-Civil Defence Readiness - Internal Audit 2022/23 - Plan -Cyber Risk prevention update	- Review of Insurances	-Internal Audit Report (outcomes)	-Committee Self-Review (workshop) - Annual Report 2022/23 (final draft for approval)	- Internal Audit (Plan for 2024, and status report on previous year audit) - Annual Plan 2023/24 update	- Internal Audit (Plan for 2024, and status report on previous year audit) - Annual Plan 2023/24 update	- Review of Insurances
One-Off Items	- Section 17a Reviews final project plan and templates	- Climate Change resilience, strategic risk - deep dive - 3 Waters Reforms - update	- Risk 32 - Lone Worker - deep dive - 3 Waters Reforms - update	- 3 Waters Reforms - update	- 3 Waters Reforms - update	- 3 Waters Reforms - update	- 3 Waters Reforms - update	

MINUTES
Audit and Risk Committee

TE KAUNIHERA Ā ROHE O WHAKAAHURANGI
STRATFORD DISTRICT COUNCIL

F22/55/05 - D22/47533

Date: Tuesday 6 December 2022 at 2pm
Venue: Council Chambers, 63 Miranda Street, Stratford

Present

Mr P Jones (the Chair), the District Mayor N C Volzke, the Deputy Mayor M McKay, Councillors: G W Boyde, J M S Erwood and V R Jones

In attendance

Councillors: S J Beck, W J Sandford and A K Harris (*via audio visual link*)

The Chief Executive – Mr Sven Hanne, the Director – Community Services – Ms K Whareaitu, the Director Assets – Mrs V Araba, the Director – Corporate Services – Mrs T Raich, the Director Environmental Services – Mr B Sutherland, the Committee Advisor and Executive Assistant – Mrs E Bishop, the Health & Safety/Civil Defence Advisor – Mr M Bestall (*part meeting*), the Corporate Accountant – Mrs C Craig (*part meeting*), the Projects Manager/Engineer – Mr S Taylor (*part meeting*), the Roading Asset Manager – Mr S Bowden and one member of the media (Stratford Press).

Via audio visual link: Pam Thomson and Yan Oon (Deloitte (part meeting))

1. Welcome

The opening karakia was read.

The Chair welcomed the District Mayor, Councillors, staff and the media to the meeting.

The Chair reiterated the health and safety message and emergency procedures.

2. Apologies

Apologies were noted from Councillor A M C Dudley and C M Tongaawhikau.

Recommendation

THAT the apologies be noted.

VOLZKE/ERWOOD
Carried
A&R/22/45

3. Announcements

The Chairman welcomed the auditors from Deloitte. He noted that approval had been given to move item 15 – Correspondence to be considered now. This was to allow representatives of Deloitte to present on the Annual Report and audit process.

Item 15 – Correspondence.

Pam Thomson of Deloitte presented to the Audit and Risk Committee, the auditors report was tabled as correspondence and had been circulated to the Committee. The following points were noted:

- The audit is largely completed, however there are minor points that are still being worked through such as the substantive testing, financial reporting and regulatory matters.
- The Financial Statement Disclosure in regard to the three waters will still be included, however it is awaiting the Auditor General to release the proposed changes.
- The highlighted areas of focus have not changed since the original planning document. The significant risk around property, plant and equipment has been one of the key focuses with increasing costs, supply chain issues and disruptions. Valuations were completed for roading and water assets and discussions held with the valuers with no concerns identified. It is recommended in the future to align the valuations with the year-end especially given the significant movement in prices and inflation over the past 12 months. Not aligning these requires additional procedures to be undertaken by auditors and management to ensure nothing has changed materially.
- It was noted the area of focus – Management's ability to override controls was not something specific to this council but to do with auditing standards. It is about understanding key controls around reporting processes and following general testing from set and detailed criteria there were no identified material issues.
- Revenue recognition is always considered an important focus, there were no issues that were found.

Questions/Points of Clarification:

- The District Mayor questioned if there was any advice for looking to plan ahead with the Annual Plan with the unknown outcomes of the three waters reform. Ms Thomson noted that auditors appreciated the challenges that councils have and will continue to liaise with the Auditor General on all issues faced by the sector to understand what needs to be done going forward, this can only be done once the bill is accepted and it is known what the various amendments are.

Yan Oon noted the following points in completing the presentation:

- The area of focus relating to the public sector specific procedures is largely determined by the Auditor General and where there are concerns around good practice guidance, specifically around sensitive expenditure, conflicts of interest and severance payments. There were no identified matters or issues but there were a couple of improvement points which will be communicated with management and some best practice examples to refer to.
- The impact of Covid-19 has been an area of focus of for a couple of years now and there are areas that will continue to be impacted, such as the valuation of assets or whether there are changes required for internal controls. There were no identified matters of issue.
- The area of focus for the Statement of Service performance is where council is required to include a statement around the performance framework including in the Long Term Plan. It is important to record performance to ensure council is meeting legislative requirements and that they are consistent with the 2021-2031 Long Term Plan. There were no identified matters of issue.
- The area of focus relating to Climate Change and Natural Hazards relates specifically to the Long Term Plan and if there is a need to consider these in the financial provisions. This has been discussed with management to see what they have done in terms of the long term plan. There were no identified matters of issue.

Ms Thomson concluded the presentation:

- A separate report will be provided to management post signing the financial statements. Based on the report to date there is nothing identified that will have a material impact.
- There is one unadjusted difference relating to the fair value of Percy Thomson Trust investments to be revalued for consolidation purposes to be carried to cost in council's statements.
- It was confirmed that the Annual Report was on track for adoption by Council on 13 December 2022 and that it was expected an unmodified opinion would be issued.

4. Declarations of Members Interest

The Chair requested councillors to declare any real or perceived conflicts of interest relating to items on this agenda.

There were no declarations of interest relating to items on this agenda.

5. Attendance Schedule

The attendance schedule for Audit and Risk Committee meetings was attached.

6. Programme of Works

D21/42807 Page 10

Recommendation

THAT the Audit and Risk Committee's rolling programme of works up to the end of 2023 be received.

BOYDE/VOLZKE
Carried
A&R/22/45

7. Confirmation of Minutes

7.1 Audit and Risk Committee – 20 September 2022

D22/36176 (open) D22/36102 (PE) Page 11

Recommendation

THAT the confirmed minutes of the Audit and Risk Meeting of Council held on Tuesday 20 September 2022 be received.

P JONES/ERWOOD
Carried
A&R/22/45

8. Matters Outstanding

D18/27474 Page 19

Recommendation

THAT the matters outstanding be received.

ERWOOD/McKAY
Carried
A&R/22/45

9. Information Report – Health and Safety

D22/45592 Page 20

> **Recommendation**
>
> THAT the report be received.
>
> V JONES/P JONES
> Carried
> A&R/22/45

The Health and Safety/Civil Defence Advisor noted there had been a further four incidents at the pool to the end of November.

Questions/Points of Clarification:

- Mr Bestall noted that the lockdown at the library had highlighted the need for an actual procedure for this sort of event to be added to council's emergency procedures.
- The District Mayor noted his concern regarding the situation with Puniwhakau Bridge and Worksafe entering the discussion. He felt if the bridge was deemed as a workplace then would a road be considered a workplace? Mr Hanne noted that subsequent statement had been received from Worksafe requesting progress before the logging company needed to cross over the bridge again. Council was in discussion with Waka Kotahi regarding a legal opinion on worksafe's directive. The District Mayor requested that this issue also be raised with Local Government New Zealand. It was noted that there had been damage made to the bridge in February from the logging company. Additional scaffolding has been added to raise the handrail and consultants had undertaken an inspection of the bridge who have stated in their opinion it is still ok to carry 44 tonne loads as it was strengthened for in 2012. A status update was requested to be added to the matters outstanding. The immense concern over the precedent this complaint could take was noted.
- Councillor Boyde noted that council had not been advised of the incident at the aerodrome and Mr Bestall noted that an incident of this nature should have been communicated to council.
- The Chair requested further clarification on incidents with either no further action required, remedial action proposed or remedial action undertaken.

10. Information Report – Internal Audit 2021/22

D22/45824 Page 24

> **Recommendation**
>
> THAT the report be received.
>
> P JONES/V JONES
> Carried
> A&R/22/45
>
> **Recommended Reason**
> The Audit and Risk Committee is tasked with reviewing and monitoring the internal audit activities of Council on behalf of elected members.

Questions/Points of Clarification:

- It was noted that the contractor management results were largely due to the specialist skillset required for the contracts reviewed. The Procurement Policy was not applied because it would not have delivered the desired outcome. It has highlighted that there is also a lack of contractual agreements in these cases. The Procurement Policy will be reviewed to ensure council is able to find the right source for the required work and at the same time improves its processes.
- It was noted that eye checks for staff were a recommendation from this report. The Chief Executive noted there were a number of health checks provided to staff, however eye checks were not currently on this list and would require an increased budget which could be discussed during the Annual Plan

process. He noted health checks were undertaken with staff who have regular exposure to high-risk areas. It was noted that the internal audit plan was in the programme of works and would be brought back to this committee.

The Corporate Accountant and Health and Safety/Civil Defence Advisor left the meeting at 3.09pm.

11. Information Report – Capital Works Programme – Key Projects Update – November 2022

D22/44738 Page 39

Recommendation

THAT the report be received and that the Audit and Risk Committee note their appreciation and congratulation to staff for the Transport Choices Funding allocation.

VOLZKE/BOYDE
Carried
A&R/22/45

Recommended Reason
To present an update on the progress of our key capital projects in the 2022/23 financial year.

The Project Manager/Engineer noted that since the report had been printed there had been an announcement regarding the Transport Choices Fund of which Stratford District Council was one of 46 councils to receive funding. This will go towards the town centre, school safety and connecting our community projects and means some long term plans have been brought forward. He noted one of the keys to being successful with this funding was that these projects were already in council's plans. Stratford has also been listed as a flagship project.

Questions/Points of Clarification:

- The District Mayor acknowledged and thanked the staff involved in this funding application as it had little preparation time to submit the application.
- The Chairman questioned what the Chief Executive's confidence was to complete these extra capital works. Mr Hanne noted council had achieved 80% of work in the previous year with the remaining 20% being picked up in the new financial year. He was hopeful that performance would be at a similar level.

12. Information Report – Risk Management

D22/45421 Page 47

Recommendation

THAT the report be received.

ERWOOD/P JONES
Carried
A&R/22/45

Recommended Reason
To provide an update to the Audit and Risk Committee of any significant risks and any incidents or threats in relation to significant risks on Council's risk register, since the last Committee meeting.

The Director – Corporate Services noted that councils were being encouraged to submit on the Future for Local Government Review on their accord with submissions closing on 28 February 2023.

Questions/Points of Clarification:

- It was clarified that submissions for the Resource Management Act reform closed on 30 January 2023. It was noted that the mayors at the recent Zone 3 meeting had signed a letter to the select committee regarding the timeframe and asking for an extension.

13. Information Report – Service Delivery (Section 17a Reviews) Update

D22/46483 Page 62

Recommendation

THAT the report be received.

McKAY/ERWOOD
Carried
A&R/22/45

Recommended Reason
To give an update to the Committee on the status of the Service Delivery (Section 17a) Reviews.

The Director – Corporate Services noted this report provided an update on these reviews. The first meeting will be held on 13 December 2022 and an update will be provided at each Audit and Risk Committee meeting.

Questions/Points of Clarification:

- The Chairman noted the amount of work that was currently in front of council and questioned if there was a significant benefit in undertaking these reviews? Mrs Radich noted a cost benefit by activity will be undertaken but that these reviews will help guide council through the Long Term Plan. The reviews are worthwhile but the project team will need to be selective about what is reviewed and to what depth.
- It was clarified that the inclusion of Elected Members was raised by Elected Members and would provide them with good insight and an opportunity to participate by asking the questions the community may ask. It was confirmed they will receive good guidance on the process.
- It was clarified that any consultation that arises from this process will be undertaken through the normal consultation process which will include consulting with mana whenua.

The Projects Manager/Engineer left the meeting at 3.27pm.

14. Decision Report – Three Water Reforms – Risk Management

D22/46201 Page 95

Recommendations

1. THAT the report be received.

ERWOOD/McKAY
Carried
A&R/22/45

~~2. THAT the Committee consider the discussion points listed in 7.4 of this report, and decide whether further investigation is required for each.~~

Recommended Reason
To assist and guide the Committee in managing all aspects of risk in relation to the Three Waters Reform.

The Director – Corporate Services noted the following points:

- This report was requested by Elected Members to present the financial risks to council with the three waters reforms.
- It is hoped that this committee will provide guidance towards any changes that may need to be considered in the 2022/23 Annual Plan as next year will be the last year with the three waters assets within the plan.
- The four options in 7.4 were just suggestions for the committee to consider.

Questions/Points of Clarification:

- The District Mayor noted his congratulation on this report and that it was one of the most accurate and concise reports that he had read on this subject. He noted that the report highlighted many of the deficiencies and unknowns that there are including the inability to make meaningful decisions when what the future looks like is unknown. He noted that at the recent Rural and Provincial meeting, National's Chris Bishop, had presented and noted that the repeal would very much depend on how far down the track this process was. He had stated the most likely change would be the chance to develop your own bespoke model for the region and potentially neighbouring areas. Mayor Volzke noted that a fairly conservative approach to the options presented must be taken as each of the scenarios presented would result in the assets ownership being transferred from council. He felt to stop funding depreciation would be a bold step.
- Councillor Boyde agreed with the District Mayor and noted that with so many unknowns and potential changes made it very difficult to make decisions. He noted his reservations in making big judgement calls at the moment.
- Deputy Mayor McKay noted the option to charge for the information being requested and asked if council had been charging to date. Mr Hanne noted that the information request had effectively been offset by the Better Off Funding packages which expected councils to engage in good faith with the process. The funding received well exceeds the amount that would have been charged in terms of LGOIMA charges.
- Mrs Radich clarified that with the 'no worse off' review she had presented debt to revenue and other covenants pre-reforms and post reforms under the anticipated scenario that is currently before parliament. This does show a slight worsening of some of councils ratios which may need to be looked into for council to continue to invest in capital works and investment projects. Council could either put a cap on some of its loan funded projects, or allocate some of the no worse off funding to debt but this depends on the funding to debt ratio with the three waters and future loan funded capital expenditure program.
- Mrs Radich clarified that council was still very low in its covenants and at this stage would not require these to be readjusted to borrow for further projects, but extra caution was required.
- The District Mayor noted the original intention was that debt would go to the new entity, however this will now remain on council's balance sheet with the new entity servicing the loan. The Chairman noted that there will not be further clarification until the next water services bill is passed by parliament which should be introduced before Christmas. He noted that all the was certain was that there was change coming and councils needed to prepare themselves and get into the best position possible.
- The Chief Executive noted that funding depreciation had been reduced in the last Annual Plan in light of the reforms to positively impact rates.
- It was noted that the options had been presented to give the committee the opportunity to consider them, however it was decided to not pursue these at this time.

15. Correspondence

Presented during announcements.

16. General Business

There was no general business.

17. Questions

18. Closing karakia

The closing karakia was read.

The meeting closed at 3.46pm.

P Jones
Chairman

Confirmed this 21st day of March 2023.

N C Volzke
District Mayor

Audit and Risk Committee
Matters Outstanding Index

ITEM OF MATTER	MEETING RAISED	RESPONSIBILITY	CURRENT PROGRESS	EXPECTED RESPONSE
Health and Safety Framework Review – manual review	22 June 2021	Sven Hanne/Mario Bestall	Underway	Update in item 9 – Information Report - Health and Safety
Puniwhakau Bridge – status update	6 December 2022	Sven Hanne	Complete	Update in item 9 – Information Report - Health and Safety
Health and Safety Report – further clarification to be added regarding remedial actions.	6 December 2022	Mario Bestall	Complete	Item 9 – Information Report - Health and Safety
Report outlining recommendations implemented from internal audit – including health checks for staff	6 December 2022		Complete	Item 10 – Information Report – Internal Audit 2021/22 - Update

INFORMATION REPORT

TE KAUNIHERA Ā ROHE O WHAKAAHURANGI STRATFORD DISTRICT COUNCIL

F22/55/04 – D23/7845

To: Audit and Risk Committee
From: Health and Safety/Emergency Management Advisor
Date: 14 March 2023
Subject: Health and Safety Report

Recommendation

THAT the report be received.

_______/_______
Moved/Seconded

1. Purpose of Report

1.1 This report presents a summary of three-monthly progress and any highlights for the main areas of activity within for the period to 28 February 2023.

2. Executive Summary

2.1 This report provides an overview of Council's health and safety performance through statistical data reported and recorded in the health and safety software (Vault) for the three months ending 28 February 2023.

2.2 Results of data analysed since 1 December show that there has been a total of 70 events logged in Vault. This incorporates 52 pool events that are now being logged in Vault. There was 3 near miss reported and no positive observations noted.

3. Incidents

1 December -2022 – 28 February-2023

	Report Period 1 Dec 22-28 Feb 23	Average amount of incidents per month	Average amount incidents last Quarter	Running YTD Balance (1 July2022 – 30 June 2023)	YTD average amount of incidents
Events	**70**	**23.3**	**13.6**	**120**	**15.0**
Of which:					
Injury(to our staff/ Contractor)	2			3	
ACC Claims	-			-	
Notifiable	-			-	
Near Miss	3			4	
Observations				-	
Other	65	21.6	13	113	14.1
Type of Incident					
Slips/Trips/Falls	7		6	13	
Sprains/Strains	2		4	8	
Cuts/Abrasions/ Bleeding nose	20		5	26	
Bruising	4		5	9	
Rescues	3		3	6	
Contamination incidents (Pool)	1		2	3	
Aggressive/Abusive Customer	5		4	12	
Trespass	-			-	
Vehicle Damage	2		0	2	
Non-compliance of process	1		1	2	
Plant/Building/Equipment	6		2	8	
Other	14		12	26	

	Period 1 December 22- 28 February 2023	**Running YTD Balance (1 July2022 – 30 June 2023)**
Level of Treatment		
First Aid /DR/ Medical Centre	33	56
Level of Investigation		
No Investigation	42	72
Minor Investigation	18	24
Formal Investigation	10	23
WorkSafe Investigation	-	-
Health and Wellbeing		
Workstation Assessments	4	7
EAP Referrals	1	7
Health Monitoring Assessments	-	25
Health and Safety Committee Meeting	1	3
Site Reviews	1	3

3. Events

3.1 Wai O Rua – Stratford Aquatic Centre remains the council location with the most incidents. This can however be attributed to the high number of visitors frequenting this facility. User numbers for the new pool are approximately double that of the old pool with a large portion of that growth being in the younger visitor ages that are naturally more prone to minor incidents (bleeding noses, grazed knes).

Overall, it is important for Wai O Rua and Council to take measures to prevent injuries and ensure the safety of our patrons. By monitoring and addressing injury trends, implementing safety measures, and providing appropriate training and education, Council can ensure that our customers can enjoy the services without undue risk of harm. Although the amount of injuries has risen, the seriousness of the injuries has not increased and it is suggested that the number and severity of injuries are within acceptable levels when considering the nature of the business of the pool complex.

3.2 There has been a shift towards a new format of reporting key risks and incidents to council, with a focus on identifying and mitigating potential hazards before they escalate into incidents and or key outcomes from major investigations.

Incident 1

Incident type: Workplace ergonomics
Investigation & event details: recurrence/aggravation of historic injury
Specific outcome: changes to the staff member's work environment including desk and chair height, provision of ergonomic equipment and suggestion that the staff member stagger repetitive duties
Organisation-wide implications: none as ergonomic equipment already readily available. Have historically undertaken ergonomic assessments organisation wide but have found that without buy-in from staff, these are immediately undone, therefore have reduced them to on request basis.

Incident 2

Incident type: external complaint – health & safety
Investigation & event details: external complaint about competence & standard of skill level council staff
Specific outcome: review of processes, procedures, competence and qualification of staff and relevant in-house training processes. Feedback taken into consideration in ongoing improvements of operation
Organisation-wide implications: none as was specific to role. Council provides a wide range of job specific training for the broad range of roles we undertake. Wherever possible these utilise external qualification and or accreditation for transparency and quality control.

Incident 3

Incident type: physical injury – staff member
Investigation & event details: injury obtained while undertaking tasks not part of role or assigned by supervisor/manager, failure to assess situational risk/undertake JSA
Specific outcome: re-iterated processes when undertaking unfamiliar tasks as well as processes to follow once an injury occurs
Organisation-wide implications: newsletter article on undertaking unfamiliar tasks as well as processes to follow once an injury occurs

Incident 4

Incident type: airplane crash – not directly involving council assets/infrastructure
Investigation & event details: fatal airplane crash within short distance after take-off from council owned aerodrome. Further event details not yet know – under investigation by CAA
Specific outcome: immediate contact made with first responders/incident investigators. Immediate inspection of runway and feedback sought from other pilot who used same runway on the day to identify any potential issues with council assets. None identified, hence runway left operational.
Organisation-wide implications: None

4. Civil Defence

4.1 The new training calendar is out for the year. Internal meeting with managers held earlier last month identifying key staff for key roles within EOC that will need to be released for training. There are 42 trained staff members currently that are trained to varying degrees but the intention is establish fully trained staff members that are proficient to a function level with CIMS.

5. Contractors

5.1 There have been no reported incidents with contractors in the past three months.

6. Site reviews

6.1 One site review has been conducted over the period with minor non-conformances noted and corrective actions issued.

7. EAP Referrals

7.1 There has been one EAP request reported in the portal for the period.

8 Wellness Committee

8.1 The Committee remain well engaged and committed to leading wellbeing across the Council. There has been one meeting held this year with the intention to meet quarterly.

9 Matters Outstanding

9.1 Health and Safety Manual

The review of the Health and Safety Framework has been undertaken as part of the overall Health and Safety Manual review which is needing to signed off. The first draft has been reviewed and final changes are now being implemented.

9.2 Puniwhakau Bridge

Further to my last report regarding the condition of the wooden handrail on the bridge located at the end of Puniwhakau Road I can confirm the following:

1. Consulting Engineers have confirmed that the existing structure is capable of carrying Class 1 loadings i.e. 44 tonnes
2. As recommended by worksafe, the forestry management company has been informed by email that for any loads greater than 44 tonne, a permit is to be submitted to SDC for approval.
3. Worksafe closed the Improvement Notice on 9/12/2022 following additional corrective actions by council and commitments to undertake additional works by 31 march 2023. These works have been scheduled by council's maintenance contractor.
4. A request by SDC for an internal review of worksafe's actions has been declined by worksafe.
5. SDC staff have engaged with NZTA and LGNZ regarding this matter and both organisations are making enquiries with NZTA and are watching whether this was a one-off by worksafe or is part of a more vigilant focus on roading assets.

M Bestall
Health and Safety/Civil Defence Advisor

[Approved by]
Sven Hanne
Chief Executive **Date:** 7 March 2023

INFORMATION REPORT

TE KAUNIHERA Ā ROHE O WHAKAAHURANGI
STRATFORD DISTRICT COUNCIL

F22/55/04 – D23/7299

To:	Audit and Risk Committee
From:	Corporate Accountant
Date:	14 March 2023
Subject:	Internal Audit Report 2021/22- Update

Recommendation

THAT the report be received.

Recommended Reason
The Audit and Risk Committee is tasked with reviewing and monitoring the internal audit activities of Council on behalf of elected members.

_______/_______
Moved/Seconded

1. Purpose of Report

The purpose of this report is to enable the Audit and Risk Committee on the subsequent actions taken, as a result of the findings arising from the internal audit that was carried out in 2022 by Stratford District Council staff.

2. Executive Summary

2.1 The Audit and Risk Committee have, in its Terms of Reference adopted in February 2020, an obligation to:

1. Agree the internal audit programme, review the findings of internal audits, and to monitor management response and implementation of their recommendations.
2. To ensure that recommendations highlighted in internal audit reports are actioned by management.
3. To review the internal auditors and their activities.

This report provides the Committee with the opportunity to action the obligations above.

2.2 Key findings from the audit – based on the risk categories were:

- Data and Information
  - Controls on approved online platforms is tight, as verified by Deloitte's IT auditors.
  - Recommend to conduct an audit of cloud-based systems and access.
- Financial
  - Recommendation to ensure offices with bulk IT equipment, or at times hazardous chemicals, are securely locked at the end of the day; and
  - Recommendation to have all cleaners in the Administration building sign in each day.
- Reputational and Conduct
  - LGOIMA register well maintained and information recorded correctly;
  - Recommendation to ensure full documentation held with all access to systems;
  - Recommend that when staff leave, all relevant passwords are changed and access discontinued immediately;
  - Recommend that if a staff member commences employment before the police vetting form is received back from NZ Police, the new employee must not be left alone, and is to be supervised by another staff member.
- Health and Safety Wellbeing
  - Recommendation to include the vehicle rules as part of the induction process for all staff;

    - Recommendation to have driver training e.g., defensive driving, and 4WD, where applicable;
    - Recommend to ensure all relevant information regarding a staff member (licence, convictions etc) be held in one register and updated annually:
    - Recommend that budgets are included to allow for ergonomic workplace assessments, and equipment required as a result.
- Operational
    - Recommend investigating whether RAMM can be used to store waters information, to provide for back up when needed.
    - Recommend enhancing the procurement process, including a specialised software programme being used
    - Critical assets records should be held in one place, and available to staff when necessary
    - EnviroHaz compliance certificate displayed had expired.

3. Local Government Act 2002

Under section 10 of the Local Government Act 2002, the Council's purpose is to "enable democratic local decision making by and on behalf of communities; as well as promoting the social, economic, environmental, and cultural well-being of communities now and into the future"			
Does the recommended option meet the purpose of the Local Government 4 well-beings? And which:		Yes	
Social	**Economic**	**Environmental**	**Cultural**
	✓		

3.1 A local authority must manage its revenues, expenses, assets, liabilities, investments, and general financial dealings prudently and in a manner that promotes the current and future interests of the community (Section 101 of the Local Government Act 2002 "the Act"). The internal audit process is a mechanism by which senior management and elected members can get some form of assurance that the Council is managing its assets prudently.

4. Background

4.1 The purpose of carrying out an annual internal audit is to provide additional assurance to the Audit and Risk Committee that the Council is managing its risks effectively. It fulfils the Council's responsibilities in the Risk Management Policy approved in September 2017. The following is an excerpt from the Council's Risk Management Policy:

> "***FRAME*** *- Risk management practices are framed in the context of the Council's risk appetite; The Stratford District Council's strategic and business objectives; and the strategic, environmental and organisational context within which the Stratford District Council operates and from which risks arise.*
> ***ASSESS*** *- what, why and how events may arise are identified, existing controls determined, and risks are analysed in terms of their likelihood and impact in the context of those controls.*
> ***RESPOND*** *– Stratford District Council develops and implements specific risk management plans - with controls and treatments for high impact risks, or monitoring measures for lower or accepted risks – in response to risks.*
> ***MONITOR*** *- Monitoring and review occurs throughout the risk management process, with oversight and review of Risk Registers and any changes that might affect them; this includes communication, consultation and reporting at all stages that enables the Stratford District Council to minimise losses and capitalise on opportunities."*

4.2 This audit report relates to the third in-house internal audit undertaken since the inception of the Audit and Risk Committee, the first one being in July 2020. Unlike the previous internal audits which were undertaken by external consultants, these audits were done by council staff, however still focused primarily on risks contained in Council's Risk Register.

4.3 A wider risk-based audit is considered to be a more effective use of an internal auditor, rather than focusing purely on a financial based audit. At year end, external auditors undertake a significant review of the Council's financial processes, testing of asset and liability balances, and substantive transactional testing. In addition, the auditors review the effectiveness of internal controls in the finance function. Council officers are actively identifying ways to minimise and reduce the incidence of errors, or deliberate acts of fraud, on an ongoing basis.

4.4 It was once again considered good practice to undertake this year's internal audit by council staff. In addition to cost savings, this also gave the audit participants a better understanding of processes within other departments, assisting with individual personal development and cross department collaboration. The staff responsible for the function being audited also directly benefited from the audit as it was an opportunity for them to revisit their current processes and procedures.

4.5 The internal audit was carried out in line with the Internal Audit Plan that was approved by the Audit and Risk Committee at the July 2022 meeting. A report was presented to the Audit and Risk Committee in December 2022 with the results, and as expected, the audit identified areas for improvement and these are commented on in the next section.

4.6 Other work that was performed

4.6.1 Review of contractor management

Council requested that an internal audit be undertaken to assess the systems and controls in place to ensure that contractors' services are being used effectively and correctly. This review included the on-boarding process; training provided by staff; access to council owned property i.e., IT systems, offices, equipment; and health and safety procedures.

New Plymouth District Council had recently hired Deloitte to review their use of contractors, from which a number of findings arose, as a result it was considered prudent that SDC conduct a similar review.

Findings and recommendation

- Nine of the nine selected for the review did not have a contract, nor follow the procurement process
- All nine were providing services, not supplying goods
- Five of the nine performed the services on council owned property.

Update on where this is at

Missing Contract / Procurement Process

A current review of the Procurement Policy is underway, as part of the policy review schedule (this policy is due for review in the 2022 / 23 financial year). The policy itself is generally robust and provides good guidelines to follow for the procurement of goods and physical works, it is however not suitable for the engagement of professional service providers. It is the area of professional service providers that the audit found council processes to be lacking. The updated policy will provide separate pathways for the different procurement types.

In addition to the above mentioned shortcoming of the procurement policy, there is also discrepancy between the Procurement Policy and Council's Procurement Procedures Manual. The procedures manual does not accurately reflect the details of the policy, and is most likely to be one of the causes for not following correct procedures. This will be updated once the policy has been reviewed and adopted.

Services Providers

A variety and at times lack of agreements in place with service providers is due to staff not following correct procedures. The processes mentioned above will eliminate this issue.

Access to Council owned property, offices, equipment – Access to the appropriate property is managed by the Property Officer, who assigns keys, fobs etc. on request from the manager responsible.

All Medium/ high risk contractors/suppliers have to either supply a JSA for every job or become prequalified. If a contractor is not prequalified a JSA will be accepted prior to work starting showing a systematic step by step way and logical evaluation process on how a job, task, process, procedure, or the contracted work is to be carried out safely before every job.

Lower risk contractors/suppliers such as couriers do not need pre-qualification.

4.6.2 Swimming Pool Stocktake

Given that there was the upcoming move to the new pool complex, council needed to ensure that the stock that was currently held on the shelves for resale matches exactly with what is held in the electronic stock register.

This stocktake was performed manually, in September 2022, and overseen by finance staff, then compared to the register.

Findings and recommendation

The value of stock on hand at that time was minimal, however the manual count and the electronic version did not match with some items. One of the reasons is that when staff take an item off the shelf for work purposes, the stock register is not adjusted accordingly.

Given that the new pool, Wai o Rua, is now fully operational, and stock levels will start to build up again, a further stocktake will be done in the new year, to ensure manual counting and electronic stock levels match.

Update on where this is at

Now that the new Aquatic Services Team Leader has commenced employment, the stocktake will be done within the next month, in conjunction with training on the management and reconciling of stock on hand

5. Information Summary

5.1 Attached as Appendix 1 is a summary of the risks identified, the resulting recommendations, and what actions have been taken to reduce and/or control each risk. These are summarised below:

a) Risk 16 – Data and Information -Unapproved online platforms used

- i. All request for software of hardware goes through the IT helpdesk and consistent with council's Information Acceptable Use Policy.
- ii. Software access based on the role.
- iii. Any new cloud systems must go through a Cloud Risk Assessment, using DIA guidelines.
- iv. Testing to see if hacking is possible cannot be undertaken internally as it requires a specific skill set.
- v. Controls on systems and access are tight.

b) Risk 36 – Health and Safety and Wellbeing – Council vehicle accident

- i. Reviewed staff register in Vault, and consulted Health and Safety Advisor on policies and procedures.
- ii. Council has a register but does not have all staff, nor all the details.
- iii. No driver training is currently provided.

iv. Need to keep register up to date, and include all staff, and provide driver training where necessary.
v. Ensure all staff are familiar with the rules and policy relating to vehicle use.

c) ***Risk 44 – Operational – Road closures unplanned***
i. Reviewed progress reports for road closures.
ii. The test samples did not contain sufficient information to tell whether the closures were planned or unplanned.
iii. The contractor to include whether planned or unplanned in their weekly report, and the expected duration of the closure.

d) ***Risk 50 - Operational – Key person risk***
i. Good business continuity plans prepared in response to Covid measures
ii. Procurement process development is ongoing
iii. Look at using RAMM to hold waters information also, so there is always a backup available.

e) ***Risk 53 – Reputational and Conduct - Release of incorrect or confidential information***
i. Reviewed LGOIMA Register, and spoke with relevant staff members.
ii. The register is well maintained, all information recorded correctly, and staff aware of responsibilities.

f) ***Risk 57 – Reputational and Conduct – Online passwords***
i. Ascertained processes relating to sharing system passwords, records kept, and the process when a staff member leaves.
ii. There are some systems that have shared passwords, including administration access for IT, however this password is changed regularly.
iii. There is no register kept that lists all staff who have access to a shared password, so a register is recommended. This will include external contractors as well as staff.

g) ***Risk 63 – Financial – Theft by contractors***
i. Various council areas were checked for security of council property, outside of normal business hours.
ii. The library / i-site and pool had minimal opportunity for theft, however the administration building was not as secure.
iii. Cleaners are not required to sign in to the visitor i-pad, however contractors and visitors during the day do need to sign in.
iv. There is no way of knowing who came in each night to clean, and at what time, should anything go missing. The IT office and the storage room in the engineering office are the main locations for items of value that could be removed, particularly when the building is empty of staff.
v. Recommend that cleaners sign in to the administration building every day.
vi. Recommend that some form of security be placed on the IT office, or storage areas within it, and on the engineering storage room.

h) ***Risk 67 – Health and Safety and Wellbeing – Muscular discomfort, ergonomics***
i. Viewed a selection of strain incidents recorded, and spoke with a group of staff regarding a safe work environment.
ii. No current budget for eye checks or ergonomic equipment.
iii. No current formal process for ergonomic assessments, although he Health and Safety Advisor does do regular checks.
iv. Recommend an external workplace assessment be done in relation to ergonomics within each office space.
v. Recommend eye checks be provided every two years to staff.

i) ***Risk 71 – Operational – Critical asset failure***
i. Evidence of bridge inspections available, and CDEM response document for roading and water assets was available.
ii. No evidence of roading contractor's qualifications and experience.
iii. No evidence available for two yearly reviews of 3 waters critical assets
iv. EnviroHaz compliance certificate currently displayed had expired. together with data safety sheets, also a certificate for each officer qualified to handle chemicals.

j) Risk 75 – Reputational and Conduct – Council employees abuse members of the public

i. Selected a set of staff who had started at the pool within a specific time period, to ensure they did not start work until the police vetting form had been received by council.
ii. Of the 5 selected, 3 started working before the vetting form was received from the police.
iii. Need to look at the timeframe for pre-employment procedures.
iv. If the employee must commence work before the form is returned by the police, then they must be under continual supervision until cleared.

6. Strategic Alignment

6.1 Direction

This does not link directly to Council's strategic direction or the long-term plan, however direction was taken from Council's Risk Register which identifies and evaluates the risks of all Council's activities and responsibilities. This register was adopted by the Audit and Risk Committee and regularly reviewed to ensure it meets the needs of council.

6.2 Annual Plan and Long-Term Plan

There are no implications on the Annual Plan or Long-Term Plan as a result of the internal audit.

6.3 District Plan

There is no direct connection with the District Plan.

6.4 Legal Implications

Potential legal implications if recommendations not considered:

- Council could be subject to a judicial review or dispute if resource consents are granted incorrectly.
- Council could be subject to scrutiny and being legally challenged by the Department of Internal Affairs if reporting of water complaints is not correct.
- Potential liability could be imposed on Council if regulatory decisions are made incorrectly.
- Possibility of death or serious injury at a public event, or from incorrect chemical handling, could lead to litigations.

6.5 Policy Implications

Potential policy implications if recommendations not considered:

- Polices and Bylaws may become unenforceable, and Council could be acting illegally.
- If the Procurement Policy is not followed then Council could be subject to industry, media and legal scrutiny.

<u>Attachment</u>:
Appendix 1 - Summary of work findings and current status of recommendations.

Christine Craig
Corporate Accountant

[Endorsed by]
Tiffany Radich
Director – Corporate Services

[Approved by]
Sven Hanne
Chief Executive **Date:** 7 March 2023

APPENDIX 1

INTERNAL AUDIT PLAN - UPDATE ON ACTIONS TAKEN

Risk number	Risk details	Recommendations	Position responsible	Brief description of what has happened to date	Complete, or Expected date of completion
16	Approved online platforms	That the new user request form to include the option to select more cloud based applications. That an audit of cloud based systems and access be conducted as a separate audit.	IT Manager	The new user request form has been reviewed with additional options included as appropriate. Quotes will be obtained for audit.	30 June 2023
36	Accidents in council vehicles	Induction process to include vehicle orientation for all new staff. Look at defensive driver training. Look at collecting data on driving convictions to assess driver risk at recruitment. Implement a driver training procedure that should include targeted 4WD training. Reminder to the drivers to turn their lights on while driving. Update staff licence register. Promote the use of the laminated policy of do's and don'ts in the glove box.	H&S Advisor	Induction process has always involved orientation around vehicles. Drivers are still having to be reminded that our policy stages to Drive with lights on. Laminated copies of do's and don'ts in all 3 pool vehicles. Driver training and 4wd courses have been discussed at SLT but not taken further.	Induction process -complete. Defensive/ 4wd training ongoing. Driving with lights on- ongoing reminders. Do's and don'ts complete and in glove box.
44	Unplanned road closures	Ensure reports should be routinely saved within Content Manager. Ensure the contractor should provide information in the weekly report on planned versus unplanned works, associated road closures, and proposed duration.	Roading Asset Manager	We have requested Fulton Hogan keep a record of any un planned road closures as a result of an un-planned event. Some consideration needs to be given to the duration of the closure. For example a tree down may take an hour to clear, verses a significant slip which could be all day.	Work in progress - June 2023.

50	Key person risks	1. Investigate the possibility of using RAMM to asset GIS information instead of Assetfinda. This will hold data in one place, and provide further back up for staff. 2. Explore software to manage procurement in one package. 3. Update hardware to improve connections with software. 4. Update GPS to new software and install more computers for easier and more efficient uploading of data.	Projects Manager	1. Aware of only one or two councils that have converted all information to RAMM. Not an easy process to convert 3 waters information to RAMM as it is a Roading Asset Management system. Will discuss with new GIS officer on options. 2. NPDC uses Vender Panel and STDC is looking the system as well. Ideal to go with a system that is used regionally as we share same contractors / suppliers. Awaiting answer to question regarding working with Civica. 3. Price sought for upgrade of GPS software. Decision to be made on accuracy required (GIS Officer) 4. Once hardware is sorted for GPS, the software will be updated.	1. Ongoing 2. Te be submitted as part of the Annual Plan process? 3. 30 June 2023 4. 30 June 2023
53	Actioning of LGOIMA requests	No recommendations were necessary.	Communications Manager		Complete
57	Computer access and sharing of passwords	Ensure all new staff and contractors (individuals) that have access to any computer systems go through the correct IT induction system, and is documented. Ensure that where there is shared access to any system, passwords are changed immediately when a staff member or contractor leaves. and the process is documented. Ensure that when an employee or contractor leaves, the exit form has a prompt in it to ensure shared passwords are changed where applicable.	IT Manager Customer Services Team Leader Roading Asset Manager Services Asset Manager Building Control Manager	These processes have been implemented.	Complete
63	Theft by contractors	Ensure the IT office is secured. Ensure the new Aquatic Centre have resolved their storage solutions. Ensure that a lock is installed on the sliding door in the engineering office, and the door shut every evening. Ensure that there is a sign in and out process for the cleaners in the administration building	Property Officer Customer Services Team Leader	IT door now has lock on it. Cleaners have been informed to sign in and out.	Complete
67	Muscular discomfort - ergonomics	Ensure there are sufficient budgets included for each department to ensure the necessary equipment can be purchased, and allow for regular eye tests. Engage a workplace assessor to come in and assess each staff member's work space, and provide a report of what they consider is necessary, after talking to each employee. Create a register to record all workplace checks, and update as required.	Health and Safety Advisor	According to SLT there is always budget for necessary equipment (within reason) for ergonomics. Eye tests discussed several years ago and SLT at the time didn't want to proceed. A workplace assessor has not to date been engaged and a register is still to be done.	To be discussed further in SLT and agreement reached on bringing in assessor and eye checks. Register to be done once agreement on ergonomic assessor is reached.

71	Critical asset failure	Ensure all copies of records to be held in an approved repository, and all responsible staff aware of where they are held. Ensure CDEM response plan for Water Assets required contact details to be updated. Ensure expired EnviroHaz compliance certificate has been removed and the current one displayed. Ensure contractors qualifications are suitable for the work required, and evidence of qualifications. Investigate whether training courses should be provided for contractor's staff.	Roading Asset Manager Services Asset Manager	All structural assets are inspected bi-annually and the inspection records are kept in RAMM. A copy can be obtained to be stored in Content Manager. Road inspections are undertaken by contractor staff or SDC personnel and rely on the experience of the person undertaking the inspection.	Complete.
75	Council employees abuse members of the public	Ensure that the request for offer of employment is extended out to at least four working days to allow all the processes to be completed within the time frames. However, the issue with this is that sometimes the police process the form on the same day, and other times it can take up to a month to be returned to council. Therefore recommend that until the police form is received by council, the new staff member is not left alone, at any time.	Committee Advisor and Executive Assistant	The viability of ensuring staff are not left alone during this period is to be discussed by the Senior Leadership Team as well as alternative options.	It is expected a process will be confirmed and enforced by 30 March 2023.

INFORMATION REPORT

F22/55/04 – D23/6964

To:	Audit and Risk Committee
From:	Projects Manager
Date:	14 March 2023
Subject:	Capital Works Programme – Key Projects Update – February 2023

Recommendation

THAT the report be received.

Recommended Reason
To present an update on the progress of our key capital projects in the 2022/23 financial year.

_______/_______
Moved/Seconded

1. Purpose of Report

1.1 The purpose of this report is to provide the Audit and Risk Committee with an update on the progress of key capital projects in the 2022/23 financial year.

1.2 The intent is to track these projects and provide confidence both to the Council and ratepayers that the capital works programme will be delivered as indicated in the 2021-31 Long Term Plan (LTP).

2. Executive Summary

2.1 The Council, in the 2021-31 Long Term Plan, approved a total of $11,764,000 for the delivery of capital expenditure for the 2022/23 financial year and $10,183,000 for the 2023/24 financial year. The total LTP (over 10 years) is $125,463,814, with 40% of this to be delivered in the first three years of the LTP.

Council has received $10.27 million for the Better off Funding in two instalments ($2.57 million and $7.7 million) which is to be spent by the end of the 2027 financial year. The Better off Funding Package is part of the 3 Waters Reform.

Council also received $7.8 million for the Transport Choices Package. This package is to promote walking and cycling in the Stratford Township. Nationally, the Ministry of Transport is targeting the reduction of vehicle emissions by promoting safer walking and cycling communities.

2.2 These projects are spread among Council departments, the majority of which are to be delivered through the Assets, Environmental Services, and the Community Development departments.

2.3 This report provides information to the Committee to enable the achievement of Section 2 of the Audit and Risk Committee Terms of Reference, specifically to allow the Committee *“To proactively assess, monitor and provide governance oversight of risks, and the internal controls instituted, including finance … Contract Management, … Quality Management.”*

2.4 Council officers are proactively managing all aspects of risks being identified in the delivery of these capital projects, which are mainly:

- Cost overruns;
- Not delivering to timeframe; and
- Not delivering what was expected.

2.5 As a result, Council officers are monitoring and mitigating the identified risks by:
- Regular tracking of the project;
- Tracking and reporting on the budget; and
- Regular supervision through communication and meetings with contractor oversight by the respective project manager.

2.6 This Capital Works Programme report will be brought before the committee quarterly.

2.7 Some projects may be delayed due to Cyclone Gabrielle. Consultants and Contractors have raised the potential for temporary relocation of resources to the flood damaged East Coast of the North Island. This could affect current and future contracts for this financial year for the following maintenance and capital projects:

- Roading
- 3 Waters
- Better Off Funding
- Parks and Reserves
- Property
- Transport Choices

3. Local Government Act 2002

Under section 10 of the Local Government Act 2002, the Council's purpose is to "enable democratic local decision making by and on behalf of communities; as well as promoting the social, economic, environmental, and cultural well-being of communities now and into the future"			
Does the recommended option meet the purpose of the Local Government 4 well-beings? And which:		Yes	
Social	**Economic**	**Environmental**	**Cultural**
✓	✓	✓	✓

3.1 Good risk management and regular monitoring supports the Council's social, economic, environmental and cultural outcomes.

4. Background

4.1 This report is directly as a result of the request made by this Committee in the November Audit and Risk Meeting, to present an update on the progress of our key capital projects in the current financial year.

5. Information Summary

5.1 Please refer to the Executive Summary and the **Appendix 1**, which shows that all year 2 projects are in progress, along with year 1 projects that were carried over from the 2021/22 financial year.

5.2 All capital projects are now being vetted and/or are under the supervision of Council's Projects Manager, who has also produced a number of documents and tracking tools to support the successful project planning, procurement and management. These tools should satisfy Audit New Zealand's requirements in terms of action plans identified at their recent audit exercise.

5.3 Updates on key projects are provided below.

5.3.1 **Connecting our Communities Strategy**

The Connecting our Communities Strategy will help identify improvements in our networks to improve accessibility for residents and visitors to the Stratford District. A specific strategy will help Council to meet some funding requirements from Waka Kotahi for the transport network.

This strategy has been approved by the Policy and Services Committee to proceed to consultation with the public. Consultation is completed and officers are working through the feedback received for present back to Council in 2023.

This strategy will help to guide projects included in the Transport Choices and Better Off Funding packages as well as provide guidance for long term walking and cycling projects.

5.3.2 **Bike Park**

All physical works is completed.

There was a delay in the production of the new signs to replace all stolen ones. These will now be installed in March 2023 with anti-theft devices.

5.3.3 **Whangamomona Camping Ground Septic Tank**

The concept design is expected to be completed by WSP in April 2023, although they have noted that the timeframe may change if the designer is required from the Hawkes Bay.

Once the concept design is complete, the design and build contract to install the wastewater system will be issued.

5.3.4 **Water Treatment Plant Membranes**

Procurement for membranes at the Water Treatment Plant is ongoing. The supplier has indicated that the membranes required may not be available this financial year. This is not expected to be a concern.

5.3.5 **Better Off Funding Projects**

SDC has allocated $2.57 million to the following projects:

- **Brecon Road Bridge – Business Case Development and Detailed Design**

  The Brecon Road Bridge will provide a link across the Patea River on the west side of town. The only access from north to south (and vice versa) for residents living on the west side of Stratford is via the Patea Bridge on State Highway 3. It is a strategic connection for SDC's roading network, Transport Choices Package and the Connecting Our Communities Strategy.

  A Request for Proposal (RFP) for the creation of a business case to submit to Waka Kotahi will be issued in March / April 2023. The objective of the business case is to apply for subsidised funding from Waka Kotahi.

- **Town Centre Project – Skate Park Development**

  The Skate Park has been identified by the community as needing a refresh due to equipment refreshing the end of its life span (Skate Bowl etc.)

  A proposal closed Tender for a design and build of the Skate Park and is being evaluated.

- **Town Centre Project – Victoria Park Drainage**

  A contract has been awarded for the upgrade of drainage of the main sportsground at Victoria Park. Physical works is programmed to start in March 2023, once the cricket season has finished.

  The contractor has signalled that this project could be delayed due to the relocation of resources to the east coast of the North Island, due to Cyclone Gabrielle. If this is the case, then physical works will be delayed until the end of the Rugby season.

- **Town Centre Project – Prospero Place and Broadway Beautification**

  This project encompasses the Prospero Place development and Broadway Beautification projects (Better Off Funding) and crossing facilities of SH.3 (Transport Choices Package)

  A project panel is to be formed in March / April 2023 to progress this project.

- **Stratford Park – Wastewater Enabling Infrastructure**

  A three-year project has been commissioned to model the wastewater network in Stratford. This project is part of this modelling and is expected to be investigated in early 2024.

5.3.6 **Transport Choices Package**

The Ministry of Transport issued a $350 million package to improve walking and cycling as well as reducing carbon emissions as part of the VKT reduction programme.

Stratford District Council was successful in an application for $7.8 million to improve:

- walking and cycling outside schools
- Walking and cycling connections between schools, Wai-O-Rua and the Bike Park
- Walking and cycling connections across State Highways 3 and 43.

SDC staff and consultants are working through concept and project designs to submit to Waka Kotahi for approval. Once approved, the community will be consulted before installation.

Council Staff are having weekly meetings with Waka Kotahi to develop a better understanding of their requirements (fully separated cycle lanes as opposed to on road cycle lanes).

Waka Kotahi visited in March 2023 so they can also get a better understanding of our roading network and the differences between a town like Stratford compared to a city like Auckland.

There is a very short timeframe in the delivery of this project (to be completed by June 2024). Council staff have raised concerns with Waka Kotahi regarding the importance of progressing this project due to the small pool of contractors that would be shared with NPDC that was allocated $16 million.

5.3.7 **Stratford Schools Safety Projects**

This project has been merged with the Transport Choices Package projects.

6. Strategic Alignment

6.1 Direction

This report is consistent with our Long-Term Plan Outcomes and directly relevant to supporting the work of the Audit and Risk Committee.

6.2 Annual Plan and Long-Term Plan

This report is consistent with the Annual and Long-Term Plan outcomes.

6.3 District Plan

There is no direct relationship with the District Plan.

6.4 Legal Implications

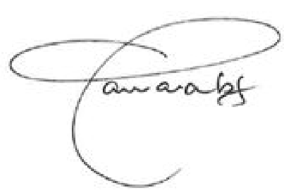
There are no legal implications.

6.5 Policy Implications

The report is consistent with Council policies relating to service delivery.

Attachment:
Appendix 1 - Capital Work Projects Update

Steve Taylor
Projects Manager



Victoria Araba
Director – Assets

[Approved by]
Sven Hanne
Chief Executive **Date:** 7 March 2023

APPENDIX 1

	Category	Budget Y2	Actual Spent	Budget LTP	Project Status	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23
Civic Amenities																	
Stratford 2035 Projects	Level of Service	$ 979,056		$ 4,664,082	*Ongoing*												
TET Multi Sports Centre	Level of Service	$ 51,300	$ 10,886	$ 554,400	*Building Consent lodged.*												
Demolish Bell Tower	Replacements	-	$ 10,719	$ 30,000	*Car Park to be sealed in March.*												
Parks, Reserves, and Cemeteries																	
Upgrade Broadway Roundabout	Level of Service	$ 60,000		$ 60,000	*Working in conjunction with Community Development Team/Broadway 2035. Awaiting the development of the Town Centre Plan before implementing the action plan identified*												
Walkway development	Level of Service	$ 10,000		$ 50,000	*Works underway to install 50 m concrete path behind the TET stadium towards the Dell.*												
Skate Park Upgrade	Level of Service	$ 150,000	$ 14,088		*Funded from the Better off Funding package. Bowl has been filled in and tenders for design and build close in March 2023*												
Victoria Park Drainage	Level of Service	$ 60,000			*Funding is from the Better off Funding Package. Contractor appointed and works is expected to be completed in March, depending on resources.*												
Parks upgrade	Level of Service	$ 6,400	$ 2,154	$ 34,300	*Lime chip path installed and planting is underway.*												
Trees of significance - access	Level of Service	$ 5,000		$ 5,000	*Waiting for iwi confirmation on signage*												
Kopuatama Cemetery entrance upgrade	Level of Service	$ 76,800		$ 76,800	*Concept design underway*												
Victoria Park - Exercise and Fitness Trail	Level of Service	$ 16,400		$ 84,300	*To be looked at in the next LTP*												
Whangamomona Camp - septic tank	Replacements	$ 45,699	$ 16,014	$ 47,000	*Consultant finalising concept design for design and build specifications.*												
* LED Screen (southern entrance)	Level of Service	$ 75,000			*NZTA have declined proposed location, further investigation on other locations underway.*												
* Discovery Trail (signage, glockenspiel upgrades, new features)	Level of Service	$ 15,000			*Elements of Project commenced*												
Purchase of land - Prospero Place	Level of Service	$ 385,500		Part of the Stratford 2035 budget	*Officers to prepare an Options Assessment report to Council for a decision to progress the preferred option*												
Pool Complex																	
Democracy																	
Computers and Periherals	Replacements	$ 212,875	$ 146,569	$ 1,442,000	*Ongoing*												
Vehicle replacements	Replacements	$ 39,500		$ 342,500	*Ongoing*												
Micellaneous equipment	Replacements	$ 20,000		$ 200,000	*Ongoing*												
Furniture Replacement - Miranda Street	Replacements	$ 3,200	$ 4,153	$ 33,200	*Ongoing*												

	Category	Budget Y2	Actual Spent	Budget LTP	Project Status	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23
Furniture Replacement – WMC	Replacements	$ 3,200	$ 1,554		*Ongoing*												
Economic Development																	
Council Subdivision	Growth	$ 2,218,975	$ 4,902	$ 3,274,000	*Negotiating with land owner on Flint Road for purchase of land*												
Rental and Investment Properties																	
Farm - Waterlines and trough upgrade	Level of Service	$ 12,300	$ 8,492	$ 24,900	*Four troughs installed after calving had finished, remainder to be installed by end of 2022.*												
Farm - Landscaping and riparian planting	Level of Service	$ 3,500		$ 38,900	*Ongoing*												
Environmental Services																	
Roading																	
Walking and Cycling improvements	Level of Service	$276,900	$ 114,808	$ 3,823,700	*Upgrade to the southern footpath on Fenton Street between Swansea Road and Cordelia Street.*												
Brecon Road Bridge	Level of Service	$ 257,700		$ 13,022,683	*Proposal for Business Case and Detailed design to be issued in March / April 2023*												
Road to Zero	Level of Service	$ 917,381	$ 520,415		*Ongoing*												
Transport Choices	Level of Service	-	$ 19,024		*Ongoing to the June 2024*												
Unsealed Road Metalling	Replacements	$ 840,000	$ 478,631	$ 10,480,208	*Funding reduced to pay for the rehabilitation programme*												
Sealed Road resurfacing	Replacements	$ 893,034	$ 59,502	$ 12,351,731	*Half of this project expected to be completed before end December 2022.*												
Drainage Renewals	Replacements	$ 700,000	$ 662,231	$ 7,634,676	*Kerb and Channel replacement on Swansea Road, Elisnore Street, and Surrey Street*												
Pavement Rehabilitation	Replacements	$ 750,000	$ 721,443	$ 7,531,118	*Monmouth Road and Flint Road*												
Structure Component Replacement	Replacements	$ 647,000	$ 59,645	$ 6,277,706	*Sites to be confirmed with consultants*												
Traffic Services	Replacements	$ 113,000	$ 47,833	$ 1,243,036	*Works less due to limited budget*												
Footpath renewals	Replacements	$ 170,000	$ 117,839	$ 1,944,901	*Works commenced on Elisnore Street and Surrey Street*												
Low cost low risk roads	Replacements	$ 521,142	$ 82,691	$ 5,270,000	*Beaconsfield Road improvements, Dunn's Bridge realignment*												
Sealed Road resurfacing - special purpose roads	Replacements	$ 114,000	$ 5,237	$ 723,916	*Pembroke Road reseals programme for early 2023. Brought forward 2023/24 allocation of funding to have one contract.*												
Unsealed Road resurfacing - special purpose	Replacements	$ 10,000			*Approved allocation from Waka Kotahi*												
Drainage Renewals - special purpose roads	Replacements	$ 10,000			*Approved allocation from Waka Kotahi*												
Traffic Services - special purpose	Replacements	$ 5,000	$ 7,281		*Installation of site rails*												
Low cost low risk roads - special purpose roads	Replacements	$ 39,695		$ 210,000	*Dawson Falls carpark*												
Stormwater																	
Pipework capacity increase	Level of Service	$ 210,372		$ 1,418,885	*Tender to be issued in March for Achilles Street Stormwater Upgrade*												

	Category	Budget Y2	Actual Spent	Budget LTP	Project Status	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23
Modelling	Level of Service	$ 31,000		$ 31,000	*Tender awarded.*												
Safety improvements	Level of Service	$ 238,770	$ 903	$ 1,275,770	*Rock amouring of stormwater culvert on Pembroke Road.Resouce consent requirements has increased costs*												
Reticulation renewals	Replacements	$ 101,983		$ 769,000	*Tender to be issued for Achilles Street stormwater.*												
Wastewater																	
Pipework capacity increase	Level of Service	$ 222,581	$ 9,805	$ 1,187,000	*Consultant engaged and works underway*												
Modelling	Level of Service	$ 51,700		$ 51,700	*Consultant engaged and works underway*												
Inflow and Infiltration programme	Level of Service	$ 297,919	$ 1,391		*3-year fixed term contract awarded*												
Treatment Plant Upgrade	Level of Service	$ 394,979	$ 68,830	$ 500,000	*Ongoing - Diatomix to enhance growth of good algae*												
Routine step / aerate renewals	Replacements	$ 50,800	$ 24,349	$ 343,800	*Ongoing*												
Bulk discharge renewals	Replacements	$ 31,000		$ 55,300	*Works planned to remediate areas around pump station that eroded during heavy rain*												
Infiltration renewals	Replacements	$ 344,986	$ 18,060	$ 1,961,600	*3 year fixed term contract awarded*												
Solid Waste																	
Transfer Station building renewals	Replacements	$ 10,300	$ 4,260	$ 70,100	*Works scheduled for February / March*												
Water Supply																	
Universal water metering implement	Level of Service	$ 558,270	$ 1,269	$ 2,195,000	*Water meters being replaced in Midhirst and Toko.*												
Electronic water reading software	Level of Service	$ 51,500	$ 1,605	$ 51,505	*Due to be trialled once meters are installed*												
Raw water delivery line	Level of Service	$ 2,000,000	$ 2,904	$ 338,200	*Final design with consultant*												
Raw water analyser	Level of Service	$ 95,000		$ 95,000	*Procurement progressing*												
Generator for Treatment plant	Level of Service	$ 105,000		$ 105,000	*Quotes being sought for Generator, Diesel Tank, and Shed*												
Street work ridermains	Level of Service	$ 301,700		$206,100	*Craig Street identified due to recent failures*												
Second water trunk main	Level of Service	$ 1,024,650	$ 399,619	$ 2,911,100	*Practical completion certificate awarded*												
Laterals	Replacements	$ 62,200		$ 350,800	*Ongoing*												
Street water ridermains - 3 waters schemes	Replacements	$ 368,900	$ 339,940	$ 2,993,100	*Surrey Street completed. Broadway scheduled for February / march 2023*												
Instructure general - 3 waters scheme	Replacements	$ 33,500		$ 338,200	*Ongoing as required*												
Toko Bore	Replacements	$ 134,500		$ 134,500	*Ongoing, as required*												
Reservoir overflow to pond	Replacements	$ 77,600		$ 77,600	*Scope of works underway*												
Pipe bridges	Replacements	$ 103,500		$ 103,500	*Patea River bridge is being replaced and Hunt Road has been upgraded*												

	Category	Budget Y2	Actual Spent	Budget LTP	Project Status	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23
Instructure general – Toko	Replacements	$ 1,600			*Ongoing as required*												
Reservoir cleaning - 3 waters scheme	Replacements	$ 82,036		$ 107,600	*Cleaning requirement to be assessed.*												
Membranes	Replacements	$ 150,000		$ 150,000	*Membrane's procurement ongoing. Supplier has indicated that none may be available this financial year.*												
Meter renewals	Replacements	$ 57,750		$ 4,338,800	*Ongoing*												
Midhirst Resource Consent	Replacements	$ 197,040		$ 309,700	*Awaiting Iwi assessment report*												
Hydrants	Replacements	$ 30,100	$ 21,939	$ 169,600	*Ongoing*												

INFORMATION REPORT

TE KAUNIHERA Ā ROHE O WHAKAAHURANGI STRATFORD DISTRICT COUNCIL

F22/15 – D23/7919

To:	Audit and Risk Committee
From:	Director – Corporate Services
Date:	14 March 2023
Subject:	Annual Plan 2023/24 Update

Recommendation

THAT the report be received.

Recommended Reason
This report provides the Committee with an update on the status of the draft Annual Plan 2023/24, and an opportunity to comment on associated risks.

_______/_______
Moved/Seconded

1. Purpose of Report

1.1 The purpose of this report is to give an update to the Committee on progress of the draft Annual Plan 2023/24. The Committee's Terms of Reference includes *"To consider the annual budget, assess inherent risk, and provide recommendations to the Council".*

2. Executive Summary

2.1 The draft Annual Plan 2023/24 is currently presenting a rates increase of 16.35%. This compares to a rates increase in year 3 of the Long Term Plan 2021-31 (for the 2023/24 year) of 4.23%, and the rates limit in the Financial Strategy of 6%. The expectation is that the final draft presented to Council will show a rates increase of 6% or less.

2.2 A rates rise of 16.35% is an unrealistic burden to place on our ratepayers, and would add increased costs to the already high living costs. On the other hand, Council costs to deliver the same level of service are increasing, largely due to high inflation - and not delivering or funding particular activities now may be delaying the burden onto our future generation of ratepayers, particularly when it comes to core infrastructure funding.

2.3 A major reason for the rates increase is due to the additional costs associated with the new swimming pool. The initial draft of the Annual Plan 2023/24 shows an increase in the rates requirement for the Swimming Pool activity of $1,397,543, from a rates requirement base of $1,239,636 in 2022/23 (increase of 113% from current year). The swimming pool was budgeted for in the Long Term Plan at a capital cost of $16,700,000 in Year 1 (2021/22). The project was not completed until partway through the 2022/23 year, therefore the full effect of the increase in operational costs and rates funding, originally planned for in Year 2 of the Long Term Plan, is now occurring in Year 3 of the Long Term Plan. In addition, the increased costs now relate to a $22,000,000 pool, rather than a $16,700,000 pool. The pool management have been directed to look at ways to reduce costs, and staff have been directed to look at various options for funding the first full year of the new swimming pool.

3. Local Government Act 2002

Under section 10 of the Local Government Act 2002, the Council's purpose is to "enable democratic local decision making by and on behalf of communities; as well as promoting the social, economic, environmental, and cultural well-being of communities now and into the future"			
Does the recommended option meet the purpose of the Local Government 4 well-beings? And which:		Yes	
Social	**Economic**	**Environmental**	**Cultural**
✓	✓	✓	✓

1.1 All four well-beings are addressed in the Annual Plan document.

2. Background

2.1 The Draft Annual Plan 2023/24 is in a work in progress stage, and has been developed from the Long Term Plan 2021-31 Year 3 figures as a starting point, and updated using actual YTD 2022/23 expenditure and updated assumptions on cost inflation and revenue growth.

2.2 With three waters reforms still uncertain, but likely, Council have decided to continue on with the usual planning process and continued to budget for three waters as business as usual for Annual Plan 2023/24.

2.3 The Section 17a reviews of Council functions are being run concurrently with the development of the Annual Plan 2023/24 and Long Term Plan 2021-31. Any efficiencies that can be adopted immediately will be factored into the draft financial budgets.

5. Information Summary

5.1 Refer to the attached summary of the Draft Annual Plan 2023/24.

5.2 Key assumptions made for the draft Annual Plan include:

- Business as usual for all Council activities in terms of service level delivery
- Inflation rates of 4-15% depending on the type of expenditure, excluding staff inflation, budgeted at 3%. However natural turnover and vacancies providing for 95% of positions filled at any one time.
- Interest Rate on borrowings 3.20% (likely to be on the low side now)
- Interest Rate on investments 3.37%
- Asset Revaluation increase effect on depreciation - 10%
- Farm rates contribution of $119,000, including $69,000 from the farm reserve

All remaining costs have been based on year-to-date actual expenditure, with the exception of certain areas where cost savings, or revenue generation could be achieved.

More staff have been employed to deliver the service levels expected at a standard required by our community and by government (and legislation) that is unprecedented. Staff are now being paid market rates in order to ensure that we can access and retain the staff required to deliver on these expectations. There is little room to increase revenue, before Council services become uneconomical to use. The ratepayer base has grown by 2% which provides little relief at the other end for spreading the overall burden of a significant rise in the rates requirement to fund Council activities.

5.3 Depreciation on Council assets overall is expected to increase by $1,091,000 in 2023/24. Staff shortages in local government and higher turnover are forcing Council to pay market salaries at a national level. A market review was undertaken in 2022 of all Council positions and their salaries to ensure Council remained a competitive employer. In addition, legislation is imposing additional pressures on local government to deliver the same level of service with additional resourcing. The cost of wages alone is expected to increase by $1,285,000. However, new staff also create additional costs in other areas such as additional IT requirements (hardware and software licensing), and additional staff costs such as ACC, Kiwisaver, Training, and office equipment as examples.

5.3 Some options to reduce the rates increase are provided below, and feedback is being sought from the Committee as to which options they would like to see incorporated into the second draft Annual Plan 2023/24:

1. Reduce the pool rates requirement:
    a. Reduce operational costs, specifically personnel and staffing which has more than doubled with the new pool, and reduce cleaning and energy costs which have more than tripled.
    b. Find ways to increase revenue, which may be a combination of increasing charges, and investigating advertising and sponsorship opportunities and setting revenue targets for both.
    c. Use some of the Financial Contributions Reserve (current balance $1,100,000) to part fund increase in delivery of new recreational amenity.
    d. Part fund depreciation on new facility on the basis that the new pool would not be replaced at the same level in future, and that 45% of the pool was grant funded.
2. Capitalising staff time in relation to projects – currently staff time spent on capital projects is all funded by rates, however it could instead be allocated to the project and the cost (rates requirement) spread over the life of the project instead.
3. Reduce the three waters rates requirement. The rates for Water Supply is expected to increase by $236,831, and Stormwater by $18,458. Costs reductions may be identified in these two areas, particularly in the areas of investment that provides more of a long term benefit, major maintenance works, and the use of consultants.
4. Conduct a significant review of the Fees and Charges schedule, with the intention of lifting all fees and charges where the benefits outweigh the costs, taking into account the principles of exacerbator pays and user pays, and the true cost of delivering each service and who should pay. This review should be closely aligned with Council's Revenue and Financing Policy.
5. Reviewing staff requirements with the intention of not budgeting for positions that have been unfilled for some time, or newly created positions that are yet to be filled.
6. To avoid deferring the rates increase to the following year, Council could consider a full review of capital projects planned for in 2023/24, and culling all projects that are not considered urgent or necessary for core operations.

6. Strategic Alignment

6.1 Direction

All Community Outcomes are affected by the Annual Plan.

6.2 Annual Plan and Long Term Plan

Annual Plan currently under consideration, and strong links to Long Term Plan 2021-31.

6.3 District Plan

N/A

6.4 Legal Implications

There are no legal implications unless elected members are looking at adopting an Annual Plan 2023/24 that differs materially from the Long Term Plan 2021-31.

6.5 **Policy Implications**

Council must consider the Revenue and Financing Policy when looking at altering any funding positions.

Attachments:

Appendix 1 Draft Annual Plan Summary 2023/24

TRadich

Tiffany Radich
Director – Corporate Services

[Approved by]
Sven Hanne
Chief Executive **Date** 7 March 2023

Appendix 1

Reconciliation	Total Rates	Rates Increase
Rates - 2022/23	14,845,000	
Rates - 2023/24 - Annual Plan	17,247,445	2,402,445
Rates - 2023/24 - LTP	14,816,027	2,431,418

	2023/24
Proposed Rates Increase	**16.18%**
Rates Increase Limit - Financial Strategy	6.00%
	10.18%
Remove/(add) to get to limit	$ 1,511,745
Proposed Rates	**$ 17,247,445**
Rates Limit - Financial Strategy	$ 15,735,700
	$ 1,511,745
A 1% increase in rates equates to	*$ 148,450*
Proposed Net Debt	**$ 25,773**
Net Debt Limit - Financial Strategy	$ 34,050
Should be less than 130%	98%

Comparison to original budget (LTP Year 2) $'000's

Net Operating	***Annual Plan 2024***	***Annual Plan 2023***	Variance	
Total Operating Revenue (excl rates)	8,945	11,625	(2,680)	-23%
Rates	17,247	14,845	2,402	16%
Total Operating Expense	25,044	21,431	(3,613)	17%

Operating Income and Expenses	***Annual Plan 2024***	***Annual Plan 2023***	Increase	
User Fees and Charges	2,996	2,820	176	6%
Personnel Costs	6,065	4,780	(1,285)	27%
Finance Costs	1,186	735	(451)	61%
Direct Operating Costs	11,094	10,307	(787)	8%
Depreciation	6,699	5,608	(1,091)	19%

Capital Expenditure	***Annual Plan 2024***	***Annual Plan 2023***	Increase	
Renewals	5,468	6,813	1,346	-20%
Level of Service	2,446	9,577	7,131	-74%
Growth	1,000	1,025	25	-2%

Overheads (actual amount)	***Annual Plan 2024***	***Annual Plan 2023***	***Variance***	
Miranda Street Office	290,773	241,489	(49,284)	20%
IT and Records	906,948	869,003	(37,945)	4%
Fixed Management	185,871	158,516	(27,355)	17%
Pool vehicles	15,000	34,024	19,024	-56%
Chief Executive	764,123	592,155	(171,968)	29%
Corporate Services	1,021,681	843,764	(177,917)	21%
Assets Administration	652,264	442,348	(209,916)	47%
Waters and Rubbish	547,937	443,975	(103,962)	23%
Property and Parks	149,012	147,741	(1,271)	1%
Environmental Services Administrat	231,479	210,638	(20,841)	10%
Community and Customer Services	398,645	378,765	(19,881)	5%
	5,163,733	**4,362,417**	**(801,316)**	18%

Rateable Properties/Units	***2023***	***2022***	***Increase***	
General Rates and Roading	5,001	4,849	152	3%
Solid Waste (Rubbish and Recycling	2,673	2,648	25	1%
Water - full	3,035	3,021	14	0%
Water - 50%	243	180	63	35%
Wastewater - full	2,697	2,674	23	1%
Wastewater - 50%	204	169	35	21%
UAGC - no of SUIPs	5,115	4,941	174	4%

CV of Rateable Properties	***2023***	***2022***	***Increase***	
Capital Value	3,563,405,000	3,519,234,900	44,170,100	1%
Capital Value - forestry only	33,057,500	16,640,500	16,417,000	99%
Capital Value - non forestry	3,530,347,500	3,502,594,400	27,753,100	1%

F22/55 – D23/7918

To:	Audit and Risk Committee
From:	Director – Corporate Services
Date:	14 March 2023
Subject:	Service Delivery (Section 17a Reviews) Update

Recommendation

THAT the report be received.

Recommended Reason
To give an update to the Committee on the status of the Service Delivery (Section 17a) Reviews.

_______/_______
Moved/Seconded

1. Purpose of Report

1.1 To give the Committee a progress report on the service delivery reviews, which are legally required to be completed within six years of the last review, which requires the reviews to be completed by August 2023.

2. Executive Summary

2.1 In September 2022, the Audit and Risk Committee approved the initial terms of reference for the Service Delivery Reviews.

2.2 The first meeting for the project team was held on 13 December 2022 and was a planning and introductory session, where the team also agreed on the Council functions that would be required for the Section 17a reviews.

2.3 The second meeting was held on 28 February 2023 where the Terms of Reference and project plan were agreed to, and a full group review was undertaken of six of the 25 council functions to be reviewed. Agreement was achieved on the outcome and recommendations of the first reviews.

2.4 The review group has now split into their respective sub-groups and will progress with completing the remaining reviews allocated to their sub-groups by June/July 2023 so that the full recommendations can be brought to Council for adoption by August 2023.

3. Local Government Act 2002

Under section 10 of the Local Government Act 2002, the Council's purpose is to "enable democratic local decision making by and on behalf of communities; as well as promoting the social, economic, environmental, and cultural well-being of communities now and into the future"			
Does the recommended option meet the purpose of the Local Government 4 well-beings? And which:		Yes – the reviews themselves will be looking at the impacts on the four well beings.	
Social	**Economic**	**Environmental**	**Cultural**
✓	✓	✓	✓

4. Background

4.1 The service delivery reviews involve analysing the various options for governance, funding, and service delivery for each Council function, including in-house delivery, delivery by a Council Controlled Organisation, another local authority, or another person or agency, and the rationale for delivering the function in the first place. It is an opportunity for Council to seek cost efficiencies and investigate options for out-sourcing or partnering with other Councils. The review does not include making operational decisions on a function; however, it does include looking at processes to achieve internal efficiencies of a function if it continues to be delivered in-house.

4.2 Council may opt out of reviewing certain functions if the delivery of that function is governed by legislation or a binding agreement that cannot be reasonably altered within the next two years, or if the cost of undertaking the review outweigh the benefits.

4.3 The reviews are to be conducted independently of the managers directly involved in that activity to avoid conflict of interest and bias. Therefore, a project team has been established made up of all levels of the organisation, including four elected members, three members of the senior leadership team, and three other Council officers.

4.4 To determine the Council functions for review, the review group went through every function and based on the exemption criteria in Section 17A (3) of Local Government Act (refer to 4.2) decided that 7 of the 31 functions did not require a review. The review group decided that the remaining functions would be reviewed at either a Full, Medium, or Light level – refer templates attached for the information requested to be completed by the budget manager. The Functions reviewed at a Full level would basically be reviewed at a more detailed level.

Function	Full	Medium	Light	No
Aerodrome	✓			
Animal Control	✓			
Building Control				✓
Cemeteries	✓			
Civil Defence			✓	
Communications			✓	
Customer Service Centre		✓		
Economic Development	✓			
Environmental Health			✓	
Farm				✓
Financial Administration		✓		
Governance				✓
Health and Safety			✓	
I-Site	✓			
Information Technology	✓			
Records Management			✓	
Library		✓		
Liquor Licensing			✓	
Parking and Bylaws	✓			
Parks and Reserves		✓		
Pensioner Housing	✓			
Percy Thomson Art Gallery			✓	
Property	✓			
Rates			✓	
Resource Consent				✓

Function	Full	Medium	Light	No
Roading		✓		
Rubbish and Recycling	✓			
Stormwater				✓
Swimming Pool	✓			
Wastewater				✓
Water Supply				✓

4.5 The review group will complete the final recommendation template, based on the Full, Medium, or Light review, and discussions at the review group meetings. Refer to the Final Recommendation template attached. These templates will be brought to the Audit and Risk Committee for approval as they are completed.

5. Information Summary

5.1 The review team is made up of a mix of elected members and senior Council staff. The review team has been split into two and allocated equal share of the functions for review. The initial reviews however were carried out by the full team to ensure consistency in analysis going forward.

5.2 The initial review looked at the following Council functions:

- Communications
- Financial Management
- Solid Waste (Rubbish and Recycling)
- Liquor Licensing
- Health and Safety
- Community Development

The final recommendation from the group for all functions reviewed was to remain with status quo for governance, funding and service delivery however a number of cost-efficiency saving type recommendations were noted and investigated further. These recommendations will be brought to the next Audit and Risk Committee meeting.

5.3 At this stage no risks have been identified during the process of the reviews.

6. Strategic Alignment

6.1 **Direction**

The outcomes of the service delivery reviews will potentially have an effect on Council direction.

6.2 **Annual Plan and Long Term Plan**

The decisions made under this review will feed into the Long Term Plan 2024-34.

6.3 **District Plan**

N/A

6.4 **Legal Implications**

There is no involvement by audit in this review, however the review itself and the subsequent conclusions are open to judicial review. The grounds for a judicial review (a legal challenge to public decision-making) are procedural injustice, illegality, and unreasonableness.

6.5 **Policy Implications**

N/A

Attachments

Appendix 1 Sample template for Full Review.

Tiffany Radich
Director – Corporate Services

[Approved by]
Sven Hanne
Chief Executive **Date** 7 March 2023

Appendix 1
Full Assessment

PART ONE - CURRENT ARRANGEMENTS				
1	**Name of the Department responsible for the service** Click here to enter text.		**Name of Service Manager** Click here to enter text.	**Name of Service under Review** Click here to enter text.
2	**Description and scope of the service** *(full range of services provided, any parts contracted out, any exclusions of service)*			
3	**Rationale for service provision**	*Legal requirement to provide the service*		
4		*Community outcomes the service contributes to (LTP)*		
5		*Council policies, bylaws, strategies and plans the service contributes to*		
6	**Performance**	*Major levels of service (LTP)*		
7		*Performance measures (LTP)*		
8	**Finance & management**	*Current governance of service (decision-making) – either political or arms-length*		

9		*Specify all Funding Sources*			
10		*Method of delivery (include term of contract if currently contracted out)*			
11		*Cost of providing the service (as per Annual Plan 2022/23)*	**Capital Cost** Click here to enter text.	**Operating Cost** Click here to enter text.	**Total Operating Revenue** Click here to enter text.

PART TWO - CURRENT ARRANGEMENTS			
Factor to consider:	**Principle tested**	**Criteria**	
Size and scale of service	The bigger the budget the more efficiency gains are possible. *Consider how much of this activity (if any) is outside council's control.* *What is the customer base for this service?* *Where could efficiency gains be made?*	Total OPEX pa	
	Capital intensive services are more likely to generate savings. *What capital projects are coming up and what impact may that have on service delivery?*	Total CAPEX pa	

Uniqueness of service delivery	The more generic the service the more opportunity for economies of scale or scope. *Is the service tailored for the customer/user/beneficiary of service OR is it high volume with little variation in service delivery?* *Does/Should the customer experience the same service regardless of location?*	Customer needs	
	If the area of delivery can be increased economies of scale could exist. *What is the area of delivery e.g. regional, catchment, TA boundaries?* *Is it prescribed by statute?*	Geographical area of delivery	
	Different council operating models suggests a review could realise benefits from comparison from approaches proven elsewhere. *Do all councils deliver the service in a similar manner? If not what are the models being used?*	Multiple models of delivery	

Type of service	Services which are core competencies* and have non-commercial objectives should be retained in house. **A core competency is defined here as a unique characteristic or capability that provides a competitive advantage in the marketplace, cannot be easily replicated by others and contributes to the perceived customer benefits of the end product.* *Is the service a statutory requirement? Is it of high public interest? Is it strategically important to retain within the organisation? How complex is it and do other services depend on it? Are the objectives for providing the service wholly or primarily non-commercial?* *What are the risks of failure for the organisation and the customer/community? Consider ability to deliver the service in exceptional circumstances (e.g. emergency event). How are they managed currently, is this adequate?*	Core competency	
Strategic considerations	How does this function further council's, community outcomes, strategic priorities or respond to a demographic trend or future problem. *Is retaining capability and capacity and therefore employment opportunities within the local community an important driver for council?*	Strategy	

Market barriers	The success of alternative service delivery methods (such as contracting out to a private sector provider) depends on the existence of a competitive market. *How many providers are there in the market? Do they have well established networks?* *Does the service require technical, highly skilled specialists? Are they a scarce resource?* *Would delivery by a third party result in greater capacity to manage complex issues OR would it create undue risk for council? Consider the current situation (local conditions) and medium term outlook.*	Supply side capability and capacity	

	The customer is a key stakeholder in these reviews. *How many customers are there and are they a specific sector of the community only?* *Is there continuous demand? Is there an increasing/decreasing change in demand for this service?* *To what extent can you charge full cost for the service, e.g. is the service non-rival and non-excludable?*	Demand	

Current efficiency and effectiveness	A service that consistently achieves its performance targets is evidence that it meets customer expectations and a review is less likely to realize benefits. *Does the service consistently achieve LOS performance measures? Refer to previous 3 years.* *Is there any credible (and quantified) evidence that a change in service delivery might provide improved service?* *Does the customer satisfaction survey results generally show a high level of community satisfaction?*	Achievement of performance targets	
Political risk	Council will get the most "bang for buck" by focusing on services that are important to citizens and are failing to meet their expectations. *Is the service a topic that people have strong opinions on? What are the views and preferences of users, beneficiaries and the community?* *Consider:* – *Complaints* – *Request for service resolution and satisfaction* – *Resident satisfaction* – *Media profile*	Public interest	

	Other Stakeholder Information *Are there any other relevant stakeholders that should be included in this review?* *What are their preferences?*		
Change in the operating environment	Service reviews realise the most benefits when there is certainty around the operating environment in which the service is delivered. *Are there any significant changes likely to happen soon that will impact on the operating environment? Consider:* – *Legislative changes* – *Central government policy agenda* – *Market conditions* – *Developments in technology might make some options feasible* – *Changes in the political direction of council*	Pending change	

Joint approach	Reviews undertaken jointly with relevant councils and service providers will realise the most value. *Would it be beneficial for other potential service providers to participate in the service review? e.g. neighboring councils, regional councils or other service providers.*	Ability to participate	
Shared services	Shared services are the preferred structural option to coordinate infrastructure across a region to support future growth and reduce costs. *Are services coordinated between neighbouring councils under the current arrangements? Could shared services support future growth and/or reduce costs for ratepayers?*		
Previous S.17a Review	The results of the last review may share some insights into other considerations. *Provide template from last review, any relevant findings?*		

PART THREE – REVIEW RECOMMENDATION	
Manager / Director recommendation	
Reason/s for recommendation	Click here to enter text.

Signed by:

Project Team Representative **Chief Executive**

INFORMATION REPORT

TE KAUNIHERA Ā ROHE O WHAKAAHURANGI STRATFORD DISTRICT COUNCIL

F22/55/04 – D23/8365

To: Audit and Risk Committee
From: Director – Corporate Services
Date: 14 March 2023
Subject: Risk Management

Recommendation

THAT the report be received.

Recommended Reason
To provide an update to the Audit and Risk Committee of any significant risks and any incidents or threats in relation to significant risks on Council's risk register from the previous quarter.

_______/_______
Moved/Seconded

1. Purpose of Report

1.1 To provide a high-level update on Council risk, in accordance with Council's Risk Management Policy.

2. Executive Summary

2.1 Events or threats that have required active management by the Senior Leadership Team, in relation to the top ten risks are as follows:

- Three Waters reforms – policy direction is somewhat unclear
- Cyclone Gabrielle and other storm related weather events
- Decisions made by elected members – new edition to this report

3. Local Government Act 2002

Under section 10 of the Local Government Act 2002, the Council's purpose is to "enable democratic local decision making by and on behalf of communities; as well as promoting the social, economic, environmental, and cultural well-being of communities now and into the future"

Does the recommended option meet the purpose of the Local Government 4 well-beings? And which:	Affects all four wellbeings in some way.		
Social	**Economic**	**Environmental**	**Cultural**
✓	✓	✓	✓

1.1 Risk Management aims to protect all areas of Council operations and therefore indirectly meet the purpose of all four wellbeings.

2. Background

2.1 The Council maintains a full risk register, which currently has 91 risks. Of these, 10 of the highest risks in terms of likelihood and consequence are monitored and reported to the Audit and Risk Committee.

2.2 The risk register includes a description of the risk, and evaluates the risk in terms of likelihood and consequence without any controls in place. Controls (risk reduction methods and mitigations) have been established for each risk, and then the risk is re-evaluated to get a residual risk score. In terms of what constitutes a significant risk, the raw risk score is taken into account rather than the residual risk as it is important that the Senior Leadership Team and the Audit and Risk Committee regularly monitor that the controls in place are appropriate and effective.

2.3 The *Global Risks Report 2023* is attached to this report. There has been a change in the top 5 global risks from the previous year, which have been identified and ranked as:

1. Cost of living crisis
2. Natural disasters and extreme weather events
3. Geoeconomic confrontation – interstate conflict and warfare including sanctions, trade wars and investment screening
4. Failure to mitigate climate change – with current measures to prevent or prepare for climate change mostly ineffective.
5. Erosion of social cohesion and societal polarization – fracturing of communities

These risks are all interconnected and impact on the severity of the other. Although these are arguably the most significant global risks currently, they all are relevant to Stratford District Council also. For example, the cost of living is a key consideration for elected members when considering setting the rates and financial budget in the Annual Plan 2023/24. Mitigating the effects of climate change is becoming increasingly important, and Council has recently established a new position of Sustainability Officer to lead Council's efforts in this area.

2.4 Other general risk related events that occurred since December 2022 are listed below:

- Insurance cover fully removed from the old pool.
- Animal welfare – getting dogs into the back of a vehicle is becoming increasingly difficult with the current dog control vehicle setup. Alternative options are being investigated further.
- Toko Rd, drainage improvement – an issue was identified in relation to safety of the road following contractor work. An additional white line was painted on the road to indicate road edge.
- Police requested the security camera footage at the new swimming pool as a result of alleged minor theft in the changing rooms. The request was declined by Council as there are no security cameras in the changing rooms.
- A person allegedly associated with Americarna was witnessed hacking at the northern roundabout on Broadway, the morning of Americarna in Stratford. This is being investigated further, however Council contractors tidied up the mess left there
- Public safety of oxidation ponds – Council staff have proposed to erect 1.8 metre deer fencing around the Wastewater pond at a cost of $175,000, however this decision has been put on hold by elected members pending a site tour.
- On 7 January 2023, there was a light airplane crash across from the Stratford Aerodrome after the pilot had taken off from the Aerodrome, that resulted in a single pilot fatality. Council has not been involved in the investigation. Not directly related but relevant, a consultant from AIMM is attending a Council workshop to discuss Council's responsibilities in relation to the Aerodrome.

5. Information Summary

5.1 Risk Events in relation to the Top Ten Risk Register

Risk 51 – Natural Disaster or Fire

Cyclone Gabrielle formed on 8 February 2023 in the Coral Sea, and a strong wind warning was issued for Taranaki from 13 February. The Taranaki CDEM (Civil Defence Emergency Management) lead the monitoring of the potential impact for the region. The Emergency Coordination Centre (ECC) was activated on 13 February.

There was no requirement to setup an Emergency Operations Centre in Stratford as the impact locally was minimal. There was no direct damage to Council assets from the cyclone.

Council staff trained in Civil Defence operations have offered to go and help the badly affected areas on the East Coast, but as of early March, no requests for support have been received.

Risk 78 – Government Policy Impacting on Local Government

Three Waters Reforms

DIA (Department of Internal Affairs) and NTU (the national transition unit, sitting within DIA laying the groundwork for the new entities and leading the 3 waters work until this gets handed over to each of the entities) are continuing to work on the reform programme in full expectation that the reforms will go through. When NTU senior staff are questioned on potential directional change either due to the change in Prime Minister or as a potential result of the next election, there is a firm belief that the reforms will proceed and if not exactly as outlined currently then close enough to still require all the work currently under way. At the end of the day, the NTU's work is governed by current legislation and any change in direction would require further legislative change.

The draft Annual Plan 2023/24 is currently being developed with a business as usual approach, with Water Supply, Wastewater and Stormwater all in Council's ownership, control and operation for the full year. As was done for 2022/23, SDC is proposing to fund up to 80% of depreciation on three waters assets. However, this is due to the significant increase in asset valuations impacting on depreciation, which is considered to be a temporary increase as a result of economic conditions.

Engagement with councils is occurring at multiple layers. The NTU is directly communicating with staff whose roles entail 50% or more of three waters tasks, with a view of absorbing these into the new entities. The most recent engagement request in fact was looking for information on staff with 30+% involvement. This received push-back from Council CEOs and the NTU clarified that this for purposes of keeping affected staff informed rather than taking those across into the new entities. This has minimal impact on SDC but is of concern to larger councils.

To date, Council has been allocated Tranche 1 of Better Off Funding of $2,570,000 (total of $10,270,000), and Transitional Funding to assist with transition costs in assisting the NTU, of $350,000. The No Worse Off Funding is yet to be confirmed.

The newly appointed Entity B CEO Vaughan Payne has started to attend 3 Waters meetings and roadshows and is in the process of visiting each Council within Entity B territory. Vaughan has served seven years as Chief Executive of the Waikato Regional Council, and a further five years as Chief Executive at Ōpōtiki District Council. The next roadshow/in-person meeting is 9/10 March in Whanganui. These focus on updates by the NTU on their current state of delivery, concepts and time lines for upcoming work and expectations/requirements for councils going forward, such as data requests. A number of councils are involved via working groups in the design elements of the new entity. We have left that to larger councils with more staff capacity. This benefits the future Entities (and their customers) rather than council directly (their future customers are our ratepayers however).

NTU staff also met with SDC staff to discuss financial implications of the transfer of 3 waters functions, assets and finances. While some elements of stormwater are still unclear, they form a very small portion of SDC's 3 Waters asset base and costs/debt. The discussion around debt aligned with SDC staff expectations in that the NTU agreed to take over all debt shown on our books (stormwater pending some future decisions) and settle this in a single payment on the hand-over date. SDC would from there have the opportunity to either immediately settle the associated debt or invest the funds if a better return can be achieved that way.

The NTU expressed a clear expectation that council's next long-term plan excluded any and all 3 Waters costs and that council budgets fully reflected this change. Apart from the impact of stranded overheads, SDC staff considered that as a given and see no issue with this in principle.

The Stratford District Council submitted on both the Water Services Legislation Bill and the Water Services Economic Efficiency and Consumer Protection Bill. Refer to the full submissions attached to this report.

Resource Management Reforms

The period for lodging submissions on the draft Natural and Built Environments Bill and draft Strategic Planning Bill closed on 5 February 2023. Taranaki's three district councils worked together alongside Govett Quilliam Law to prepare submissions. Each council submitted individually but the cooperative approach ensured a high level of commonality across the three submissions and a sense of speaking with a regional voice. Because of the timing of the submission period and the volume of material to read and understand to contribute to a submission we weren't able to include a draft submission in a Council agenda but the draft submission was circulated to elected members and any feedback incorporated before being finalised. The submissions are currently being considered by the Parliamentary Select Committee.

The submission is attached to this report.

Risk 47 – Attracting and Retaining staff

Since the last meeting, all advertised vacancies have now been filled. The only vacancies now are in relation to the swimming pool which is an ongoing experience.

Risk 72 - Elected Members Decision Making

Recent decisions made by Elected Members since the December Audit and Risk Committee meeting are below, with the risk section included.

13/12/2022	Adopt Annual Report 2021/22
24/01/2023	Road Closure for Americarna 2023
24/01/2023	Nominating Taranaki Regional Transport Committee to represent the district
14/02/2023	Road Closure for Toko Road car club event
14/02/2023	Appointment of Registrar for Pecuniary Interests Register
28/02/2023	Policy Reviews – New policies adopted were Smokefree Environments – Public Spaces and Community Events Policy, Workshop Policy, and Waste Levy Contestable Fund Policy. The Smokefree Environments – Council Buildings and Public Spaces Policy and Paper Records Policy were withdrawn.
28/02/2023	Established the Waste Levy Advisory Group
28/02/2023	Approved legal proceedings to collect outstanding rates from three ratepayers through the court process that may lead to a property rating sale.

5.4 **New Risks Identified**

There have been no new risks identified since the last Audit and Risk Committee meeting.

6. Strategic Alignment

6.1 Direction

N/A

6.2 Annual Plan and Long Term Plan

N/A

6.3 District Plan

N/A

6.4 Legal Implications

N/A

6.5 Policy Implications

This report is in line with the Risk Management Policy.

Attachments:

Appendix 1	Top Ten Risk Register
Appendix 2	Legislative Reform currently open for submission – Taituara
Appendix 3	Three Waters Submission – Water Services Legislation Bill
Appendix 4	Three Waters Submission – Water Services Economic Efficiency and Consumer Protection Bill
Appendix 5	Resource Management Reform Submission – Natural and Built Environment Bill and Spatial Planning Bill
Appendix 6	*Global Risks Report 2023* – World Economic Forum

TRadich

Tiffany Radich
Director – Corporate Services

[Approved by]
Sven Hanne
Chief Executive **Date** 6 March 2023

Appendix 1

Top Ten Risk Register

Risk Alert Number	Risk Category	Risk Subject	Risk Description	Risk Score Raw	Control Description	Residual Risk Score
78	Operational	Government Policy Impacting on Local Government	IF Government Policy significantly changes the services Council delivers or the way they are delivered, THEN this could put financial pressure on the district to fund investment in changes, or it may mean previous investment has become redundant.	20 Extreme	Where a policy change may have a significant negative impact on the Council then staff and elected members should consider making a submission to suggest and encourage alternative options. Council officers and elected members need to keep up to date with proposed changes to legislation and govt policy, and anticipate potential impacts of legislative changes and respond strategically, rather than being in a reactive position or being overly proactive. This could include joint collaboration with business and other councils, accessing alternative funding sources, or obtaining legal or professional advice. Council should aim to maintain a position where it can be adaptive and respond well to change, e.g. low to medium debt levels, diversification, good employment relationships.	20 Extreme
12	Data and Information	Cyber Attack	IF the systems are compromised and subject to a cyber attack, THEN system downtime, loss of data, ransoms may be demanded, potential privacy breach, reputational damage, and potential loss of funds.	16 Very High	Council have several security measures in place such as enterprise grade firewalls, email filtering, backups, antivirus and device management. If a breach was detected Council would activate the insurance policy and engage an IT security company resource to assist with recovery.	4 High
47	Operational	Attracting and Retaining Staff	IF Council is unable to attract and retain suitably qualified personnel, THEN services may become under threat and may cease.	16 Very High	Internal training and succession planning programs. Ensure market wages are offered for all high demand positions. Recruit off shore option should be available for high-demand positions. Make greater use of consultants if necessary and/or shared services with neighbouring Councils. Make Stratford District Council a great place to work - measure staff engagement and respond to any issues expediently.	4 High
51	Operational	Natural Disaster or Fire - Response preparedness	IF a Natural Disaster or Fire causes significant damage to infrastructure and buildings THEN community welfare may be severely compromised, putting peoples lives at risk, and staff may be unable to access systems to carry out their day to day duties and functions.	15 Very High	Civil Defence Emergency Management plans are in place. Procedures following an emergency event are widely known by a number of staff due to Civil Defence Foundational training being rolled out to majority of council staff. Business Continuity Plans need to be in place and practiced regularly for all activities - Directors responsible for having a plan in	12 Very High

					place for each of their departments to ensure core functions can continue to be delivered.	
64	Operational	Infectious Disease Outbreak / Pandemic	IF an infectious human disease outbreak / pandemic threatened NZ and reached the district, THEN this could impact staff availability, local services could temporarily close down, and the community access to healthcare is limited potentially resulting in population decline.	15 Very High	Health and Safety Advisor to keep aware of any public health notifications of disease outbreaks. Ensure there is a plan to respond to any notifications. Civil Defence covers infectious human disease pandemics and will take responsibility for local management. Follow Ministry of Health's NZ Influenza Pandemic Action Plan.	8 High
71	Operational	Critical Asset Failure	IF a critical asset (water treatment plants, stormwater, wastewater, reticulation, roading) failed, THEN unexpected financial burden may arise and there could be significant disadvantage and risk to the community.	15 Very High	Conduct 2 yearly Asset Criticality Review. Ensure there are established Civil Defence Emergency Management response procedures in relation to fixing critical assets in an emergency event. Management practices and staff training, retention to ensure appropriate skill level in critical asset maintenance.	4 High
72	Reputational and Conduct	Elected Members - Decision Making	IF elected members make significant decisions based on inaccurate/insufficient information, "biased" influences, conflicts of interest not disclosed, or lack of understanding of the financial or legislative impacts, THEN there could be funding access difficulties, audit scrutiny, financial penalties, and/or community distrust in elected members. Potential breach of Local Authorities (Member's Interests) Act 1968, and Councillors may be personally financially liable under S.47 of LGA 2002.	12 Very High	Relies on the accuracy and quality of the advice given by staff to elected members - ensure agenda, reports, and other papers are always reviewed by CEO, and Directors if appropriate. Information related to decision making should be given to elected members in a timely manner. Elected members should receive initial induction training and attend LGNZ, SOLGM conferences where material is relevant to get a better understanding of governance decision making. Council has a Professional Indemnity insurance policy for all elected members and independent committee members.	4 High
11	Data and Information	Server Failure	IF the server failed THEN systems down, data unavailable, potential data loss	12 Very High	Restore from backup - backups encrypted, and stored off-site at approved data-centres (Tier 3). Fail-over for Melbourne data centre replicates to Sydney data centre.	3 Moderate
32	Health, Safety, and Wellbeing	Lone Worker	IF a staff member is seriously injured or killed during field inspections/site visits, THEN possible health and safety breaches, death or serious injury.	12 Very High	Quality assurance, Ongoing training/awareness of HSE requirements and responsibilities, Better use of council data/knowledge base on dangerous or insanitary sites before staff member deploys to site, Use of GPS tracking, mobile phone tracking. Compliance officers to wear body cameras when on duty.	3 Moderate

58	Reputational and Conduct	Contractor Damage or Breach	IF Council and/or council contractors are found to be liable for public/environmental damage, or any actions that are unsafe or non-compliant with legislation and applicable policies and standards, THEN fines, possible injury, long-term damage, reputational damage could result.	12 Very High	Appropriate procedures and guidelines are in place to monitor contractor actions and our own including health and safety audits, contractor meetings/KPI's. The Council requires all physical works contractors to go through a thorough health and safety pre-qualification process and become approved before commencing any physical work. All relevant staff are kept up to date with pre-approved contractors register. Mini audits and random checks should be built into contracts. Contractor public liability insurance required for all major contracts.	3 Moderate

Appendix 2

Open for Submissions as at 17 February 2023

(Note – in the Taituarā Action column a green cell indicates the Taituarā draft response is open for sector comment).
Everything beneath the buff-coloured line is upcoming and the information is speculative.

Name of initiative	Agency engaging	Due date	Taituarā Action	Description
Future for Local Government draft report https://www.futureforlocalgovernment.govt.nz/assets/Review-into-the-Future-for-Local-Govt-Draft-Report.pdf	Future for Local Government panel	28 February 2023	Submit Contact Kath Ross	Draft report including recommendations from the panel.
Business Payment Practice Regulations https://www.mbie.govt.nz/have-your-say/business-payment-practices-regulations	MBIE	28 Feb 2023	No action Contact Raymond Horan	This regime will improve information and transparency around business-to-business payment practices by requiring large firms (those with turnover of $33 million a year) to publicly disclose information on their payment practices, including payment times. This includes local authorities.
National Environment Plan on PFAS https://haveyoursay.agriculture.gov.au/nemp-on-pfas	MFE (joint with NZ and Aust EPA)	28 Feb 2023	TBC	The Heads of EPAs of Australia and New Zealand (HEPA) have released the draft per- and poly-fluoroalkyl substances National Environmental Management Plan (PFAS NEMP) version 3.0 for public consultation. We're advised that this potentially affects any entity that deals with water, wastewater, stormwater, biosolids, composting and landfills.
Review of the Resource Management (infringement Offences) Regulations (NEW – added 7 Feb) https://environment.govt.nz/assets/publications/Review-of-the-Resource-Management-Infringement-Offences-Regulations-1999.pdf	MFE	6 March 2023	TBC	Considers options for increasing fines for infringement offences.

Smoked Tobacco Regulatory Regime (added 10 February) https://www.health.govt.nz/system/files/documents/publications/proposals_for_regulation_-_smokefree_environments_and_regulated_products_act_1990_22_dec_final.docx	Ministry of Health	15 March	TBC but unlikely	The Smokefree Environments and Regulated Products (Smoked Tobacco) Amendment Act came into force on 1 January 2023. The amendment also extends the Act's regulatory powers over the composition of smoked tobacco products, such as nicotine levels. Health is seeking views on proposals to implement these changes, including a retail scheme (where they are sold), and low nicotine requirements The consultation document also sets out proposals to tighten current restrictions on vaping product safety requirements and packaging. It also considers some restrictions on the location of Specialist Vape Retailers (SVR's).
Occupational regulation reforms in the building sector (NEW – added 24 February) **https://www.mbie.govt.nz/dmsdocument/26189-occupational-regulation-reforms-in-the-building-and-construction-sector-consultation-document**	MBIE	6 April 2023	TBC but unlikely	Proposals for change to the Licensed Building Practitioners regime, the Plumbers, Gasfitters and Drainlayers regime and the Electrical Workers regime.
Upcoming				
Housing Infrastructure (GST-sharing) Bill https://www.legislation.govt.nz/bill/member/2022/0154/latest/096be8ed81c6447d.pdf NB. Private Members Bill – may not proceed	TBC	Awaiting first reading	TBC	This Bill would introduce a GST-sharing scheme to fund housing infrastructure. Effectively councils would receive 15 percent of the value of building work put in place in their local authority in the preceding year.

				NB – this is a Private Members Bill that is waiting first reading. Details about consultation will only be known if and when the Bill gets a first reading.
Sale and Supply of Alcohol (Cellar Door Tasting) Amendment Bill https://legislation.govt.nz/bill/member/2022/0173/latest/contents.html NB. Private Members Bill – may not proceed	TBC	Awaiting first reading	No action proposed	This Bill allows winery cellar doors to charge visitors for the samples of their own wine and adds an off-licence category for wineries holding an on-licence. NB – this is a Private Members Bill that is waiting first reading. Details about consultation will only be known if and when the Bill gets a first reading
Civil Defence and Emergency Management Amendment Bill	Governance Admin Select Committee	TBC	Submit	Gives effect to whatever of the Trifecta Review survives the 'consultation' and policy development process. NEMA officials have said this is the formal consultation.
Land Transport Management Amendment Bill (not sure of title)	Transport and Infrastructure Select Committee	TBC	Submit Jen Coatham	Legislation to give effect to changes to the Passenger Transport Operating Model.
Royal Commission into Covid-19 response (NEW – added 5 December)	Royal Commission	TBC	Submit Raymond Horan	The overall lessons learned from the pandemic response including the economic response.
Building Amendment Bill (added 7 December)	?	Early 2023	TBC	Bill will introduce energy ratings for buildings and waste minimisation plans to support Aotearoa New Zealand's climate change goals. (Hat tip: Mark form Hamilton) Learn more about the Government's proposed changes
Climate Adaptation Bill	Presumably, Environment Select Committee	Mid 2023	Submit	Will introduce the legal framework for managed retreat and other climate response matters.

Appendix 3

TE KAUNIHERA Ā ROHE O WHAKAAHURANGI
STRATFORD DISTRICT COUNCIL

Our reference

15 February 2023

Barbara Edmonds
Chair
Finance and Expenditure Committee
Parliament Buildings
WELLINGTON

Dear Chair

WATER SERVICES LEGISLATION BILL

The Stratford District Council thanks the Finance and Expenditure Select Committee for the opportunity to submit on the Water Services Legislation Bill. We would however like to take this opportunity to express our disappointment at the short time allowed for consultation on such a significant matter.

Stratford District Council (SDC) opposes the Water Services Legislation Bill. SDC submitted against the Water Services Entities Bill (now Act) to the Finance and Expenditure Committee, and continues to oppose the Three Waters Reforms. Our submission to you outlined our opposition on the basis that:

- Non-structural regulatory interventions to achieve improved water services have not been attempted first
- Councils, including SDC, are already tackling the challenges to improve water services
- The Reforms represent a significant centralisation of community assets, particularly through the Government Policy Statement
- Stormwater services should not be delivered separately from roading and parks service delivery given their interfaces, and
- There is no guarantee that any particular community will receive investment.

We remain of the view that a model that retains asset ownership with the communities that paid for their establishment and that facilitates increased accountability through the ability of councils and or communities to appoint directors would far better reflect our and our communities' preferences.

We recommend that the Committee reconsider these aspects and our previous submission in reviewing this Bill.

SDC accepts that the Water Services Entities Act is now law. We have not undertaken an extensive review of the Bill as sector organisations (LGNZ, Taituara and Water New Zealand) will provide detailed submissions to you. We have seen these and support the technical aspects these organisations cover in their submissions. However, we have significant concerns around a number of aspects that we recommend you amend.

SDC does not wish to make an oral submission in support of this submission.

63 Miranda Street, PO Box 320, Stratford 4352
Phone. 06 765 6099 | stratford.govt.nz

ENSURING WSE PAY RATES IN ALIGNMENT WITH OTHER UTILITY PROVIDERS

Clause 22, new section 342 provides that the WSE will not be liable for rates for pipes and assets on land they do not own. This runs counter to the notion that WSE will be fully funding their activities and acts as a subsidy from the rest of the community to the WSE including from those that do not receive water services. It also sets a significant precedent for other utility providers to seek exemptions from paying rates. Pipes and assets, regardless of location, will create and incur costs for local authorities that should be accounted for through rates and there is no justification for why WSE should be exempt from paying rates.

We also note that territorial authorities will need to provide their rating information database to the WSE under clause 22, new section 319. “on a reasonable cost basis”. WSE will be required to use the capital value of a property in charging for stormwater services under clause 22, new section 340, so it is appropriate that they contribute towards the costs of the district valuation roll. We would strongly encourage an amendment to section 319 to clarify the meaning of “on a reasonable cost basis”. Councils incur significant costs in the creation and maintenance of this data and we strongly believe that WSEs need to pay a fair share of these costs as this information is equally important to their business as it is to councils’.

SDC recommends that the Committee ensure that WSE fully fund their activities by:

- Removing clause 22 new section 342 so that WSE be liable for rates for pipes and assets regardless of the land owner, and
- Amending section 319 to better define the meaning of “on a reasonable cost basis” with regards to WSEs fair and reasonable contribution to the ongoing costs of councils maintaining and providing the district valuation roll.

TRANSITIONAL CHARGING ARRANGEMENTS

We have significant concerns with the transitional charging arrangements set out in the Bill.

First, new sections 336-338 provide that local authorities may (and effectively be required to) collect charges on behalf of the water services entities through to 1 July 2029. However, Local authorities may not have the capacity, systems or resources to provide pass-through billing and customers are likely to be confused about who provides their water services. Furthermore, there is no provision in the Local Government (Rating) Act 2002 for local authorities to include WSE charges in a rates bill. This means that each local authority will need to separately invoice each property with WSE charges for these five years.

This Council does not wish to collect charges on behalf of the entity and we note with considerable concern that the tone of sections 336 and 337 suggests local authorities will have no ability to decline pass-through billing. If we collect the charges, we will also receive the front-line complaints about the level of the charges and the service, allowing the entities to be faceless. Entities must be required to set up their own billing systems and collect their own charges.

Second, SDC also disagrees with the transitional provision in new clause 63 of Schedule 1 that enables WSE to bill territorial authorities for stormwater services through to 1 July 2027 instead of consumers. Territorial authorities will have to account for this charging in their LTP and then in the rating system. SDC accepts that an alternative transitional arrangement for stormwater services is required as many territorial authorities (including SDC) charge for stormwater services through the general rate. However, charging territorial authorities who will, in turn, rate the community is inefficient and mixes accountability. It goes against the premise that WSE can stand on their own feet and, as the Department of Internal Affairs notes in its Regulatory Impact Analysis (paragraph 157), may undo the balance sheet separation of WSE from territorial authority owners. Furthermore, this provision also runs counter to clause 27 of Schedule 1 of the Water Services Entities Act which provides that the Long-Term Plan 2024-34 process must not contain any content relating to water services, including funding arrangements. This new clause would, however, require such content in order for territorial authorities to account for and then rate for stormwater service charges.

The Bill already outlines new stormwater charging provisions that use the capital value of properties. This can easily be incorporated into the transitional charging approach, although some modification will be necessary to the provisions of new section 340.

SDC recommends that the Committee:

- Amend new sections 336-338 to the effect that while councils may collect charges on behalf of the water services entities, this is voluntary and there is no obligation for them to do so.
- Remove new clause 63 of Schedule 1 and instead require water services entities to set a charge per property for stormwater services from 1 July 2024 using a modified version of new section 340, and then use new sections 336-338 for billing purposes.

DEBT REPAYMENT

We also have significant concerns about the debt repayment provisions in the Bill. Schedule 1 inserts a new clause 54 into Schedule 1 of the Water Services Entities Act. This clause requires the WSE to pay each territorial authority for its debt. However, there are several issues with the wording which may enable the WSE to avoid paying some debt associated with water services. These concerns are:

- The debt only relates to "water services infrastructure wholly or partly used in the provision of water services". This wording has several impacts:
  - This means that operating costs that have lawfully been funded through debt may not transfer. This could include operating costs for future planning purposes which are not currently "used in the provision of water services".
  - The limitation to "wholly or partly used in the provision of water services" also means that debt for work-in-progress cannot be recovered as it is not "used".
  - The limitation to "water services infrastructure" also means that non-infrastructure assets that should transfer to the WSE are not covered. This would include assets such as vehicles, computers, and intellectual property. It would also cover any debt for new systems put in place for the transitional charging arrangements.
- The clause implies that there is a five year period for instalment payments as the clause is repealed five years after the establishment date. During that time territorial authorities will still hold the debt, that debt will still incur interest, and territorial authorities will still have to make interest and potentially principal repayments. Whether these costs can be recovered from the WSE is unclear. Five years is also simply too long as it will have significant impact on the debt-to-income ratios for territorial authorities.

While we do not believe it is the intention, the clause creates a very real possibility that territorial authorities will be left with some residual debt associated with water services, and that this debt will have to be repaid by ratepayers.

SDC recommends that the Committee amend new clause 54 of new Part 2 of Schedule 1 of the Water Services Entities Act, contained in Schedule 1 of the Bill, to:

- Clarify that the amount to be transferred from the WSE to territorial authorities is for all debt associated with the provision of water services, not just for infrastructure already in use
- Clarify that the amount to be transferred includes recovery of any costs incurred by the territorial authority in holding that debt from establishment date until the repayment
- Reduce the timeframe for instalment payments to being within 1 year of the establishment date

ENGAGEMENT, PUBLICATION AND REVIEW REQUIREMENTS

Subpart 2 of Part 13 deals with engagement requirements, including the establishment of consumer forums. The Bill provides for a wide range of forum options and there is the possibility that an entity could set up one forum for its whole area to comply with the legislation, even though it is not appropriately representative and is practicably unworkable, further removing consumer representation. This new Bill does not address these concerns. The Council would like clarity on consumer forums.

CONCLUDING REMARKS

SDC reiterates its opposition to the Three Waters Reforms and therefore to the Water Services Legislation Bill. SDC's preference is for local communities, in partnership with mana whenua, to determine the appropriate way to managing local water assets. This can include local communities deciding to aggregate into regional water companies. However, if the Three Waters Reforms are to continue then a fairer regime needs to put in place so WSE fully fund their activities and do not leave territorial authorities and their wider ratepayer base with stranded costs to bear.

Ngā mihi

Neil Volzke
District Mayor
Stratford District Council

Appendix 4

TE KAUNIHERA Ā ROHE O
WHAKAAHURANGI
STRATFORD
DISTRICT COUNCIL

15 February 2023

Our reference

Barbara Edmonds
Chair
Finance and Expenditure Committee
Parliament Buildings
WELLINGTON

Dear Chair

WATER SERVICES ECONOMIC EFFICIENCY AND CONSUMER PROTECTION BILL

The Stratford District Council thanks the Finance and Expenditure Select Committee for the opportunity to submit on the Water Services Legislation Bill. We would however like to take this opportunity to express our disappointment at the short time allowed for consultation on such a significant matter.

Stratford District Council (SDC) opposes the Water Services Legislation Bill. SDC submitted against the Water Services Entities Bill (now Act) to the Finance and Expenditure Committee, and continues to oppose the Three Waters Reforms. Our submission to you outlined our opposition on the basis that:

- Non-structural regulatory interventions to achieve improved water services have not been attempted first
- Councils, including SDC, are already tackling the challenges to improve water services
- The Reforms represent a significant centralisation of community assets, particularly through the Government Policy Statement
- Stormwater services should not be delivered separately from roading and parks service delivery given their interfaces, and
- There is no guarantee that any particular community will receive investment.

We recommend that the Committee reconsider these aspects and our previous submission in reviewing this Bill.

SDC accepts that the Water Services Entities Act is now law. We have not undertaken an extensive review of the Bill as sector organisations (LGNZ, Taituara and Water New Zealand) will provide detailed submissions to you. We have seen these and support the technical aspects these organisations cover in their submissions. However, we have significant concerns around a number of aspects that we recommend you amend.

SDC does not wish to make an oral submission in support of this submission.

PRELIMINARY PROVISIONS

The definition of water services entity in the Bill is circular and unhelpful: “Water services entity means a water services entity (whether or not it is a regulated water services provider)”.

PRICE AND QUALITY REGULATION

The purpose statement in Part 2 is taken from regulatory models applying to for-profit entities, which the Council considers inappropriate for publicly owned water services via the statutory entities. There should also be explicit reference to environmental outcomes and potentially health and safety, in recognition of te Mana o te Wai.

The purpose, according to section 12, is to promote long term benefits for consumers by giving water services providers incentives to innovate and invest, improve efficiency and provide quality services, and share the benefits with consumers. Given that the entities will be non-profit monopolies, there is little incentive for entities to innovate, invest or improve efficiency and share resultant benefits with consumers. The Council would like to see the clauses relating to this purpose strengthened.

DIRECTIVE PERFORMANCE REQUIREMENTS

The role of an economic regulator should be to incentivise and make recommendations to the regulated entity, not to control directly the regulated entity's business. Section 39 crosses inappropriately into directive control by stating the items that a quality path must specify and those it may specify. The Council is concerned that the potential performance requirements extend into direct control of the regulated provider(s), specifically:

- approach to risk management
- asset condition and remaining life
- particular types of investment
- asset management policies and practices
- ring-fencing revenue and not spending it without Commission approval.

S39 makes it look as though the Commission is the entity. The Council regards this blurring of regulatory and operational functions as inappropriate. The same comments can be made about section 42 (price-quality path requirements). Treating quality and price quality separately is an unnecessary doubling-up. We have seen advice from Simpson Grierson that "Quality regulation should not be allowed to exist at the same time as price-quality regulation for the same regulated provider and water infrastructure service".
Subpart 8 of Part 2 deals with the Commerce Commission's reviews of funding and pricing plans. The Commission's ability, stated in section 52, to direct an entity to reconsider its plan is another example of the Commission being empowered to interfere directly in the operation of entities, and we think this wording should be changed so the Commission can recommend that a water services entity reconsiders its plan.

CONSUMER PROTECTION

Subpart 9 of Part 2 and Subpart 1 of Part 3 deal with designations of water services entities. The difference is unclear, but we assume it means an entity can be designated for price and quality regulation but not consumer protection, and vice versa. If so, why? The interpretation sections of the two parts do not make this issue any clearer.

SERVICE QUALITY CODE

The Bill assumes a regulated service quality code is necessary, and thus requires the Commission to make one by 1 July 2027 (clause 69). However, consistent with Part 7 of the Telecommunications Act 2001 relating to retail quality codes for telecommunications providers (section 236(1) in particular), the Commission should only be empowered to make a regulated code if the water services industry has failed to regulate, or adequately regulate, itself. We consider the water services industry should be given an opportunity to make its own service quality code(s) before a regulated one is applied.

Ngā mihi

Neil Volzke
District Mayor
Stratford District Council

Appendix 5

TE KAUNIHERA Ā ROHE O WHAKAAHURANGI STRATFORD DISTRICT COUNCIL

Our reference

SUBMISSION ON RESOURCE MANAGEMENT REFORM

STRATFORD DISTRICT COUNCIL

Introduction

1. This submission is prepared on behalf of Stratford District Council (SDC) in relation to the Resource Management reform bills (the Natural and Built Environment Bill (NBE) and Spatial Planning Bill (SP)), referred to collectively as "the Bills":

2. SDC has considered the draft submissions from Local Government New Zealand (LGNZ) and Taituara and relies on the detail in these submissions and the general views of local government organisation on the Bills. SDC has only submitted on points of particular importance/relevance to it. However, for clarity, SDC does not take a formal position with respect to the particular submission points and recommendations in the LGNZ submission, except as specified within this submission.

3. SDC has engaged with the other district councils within the Taranaki region (South Taranaki District Council and New Plymouth District Council) and understand that all three councils have a similar position in respect of the Bills.

4. SDC reserves the right to be heard on this submission and supports requests made by others for hearing of submissions to take place throughout New Zealand rather than being concentrated in Wellington.

General

5. SDC generally supports the need for reform of New Zealand's resource management system. SDC considers that the current system can be inefficient and time consuming and does not ensure the best outcomes for communities and the environment.

6. At a high level SDC questions the relationship of the RM reform to the Local Government reform programme. Many of its comments relate to the new system and the practical interactions and interests of the SDC and how it operates under the system. SDC supports timely but also logical reform that ensures the best system outcomes for its community. SDC supports that alternative workable models for the new RM system are explored, beyond the RPC to ensure better outcomes for the community.

7. SDC supports the stated objectives of the Bills, as set out in the explanatory note of the NBE, in particular the objective to improve system efficiency and effectiveness and reduce complexities.

8. SDC considers that the current ability to review and change plans under the current system is cumbersome, with costly and lengthy processes that require significant resourcing from district councils. SDC therefore supports in principle, the intention to reduce the number of planning documents through the consolidation of plans into NBE plans and Regional Spatial Strategies ("RSS"). However, SDC is concerned that a key method for achieving this objective appears to be by reducing the input of Local Authorities. This concern is discussed in further detail later in this submission. Further, SDC is concerned that while the number of plans may be reduced, the Bills may not achieve the intent to provide enhanced efficiencies and reduced complexities.

Purpose and preliminary matters

9. SDC endorses the key matters raised in the draft LGNZ submission regarding purpose and preliminary matters, particularly seeking further clarification on:

- the requirement to “uphold” Te Oranga o te Taiao;
- the integration of Te Oranga o te Taiao and Te Mana o te Wai;
- the meaning of “compromising” wellbeing of future generations;
- the reconciliation of clauses 3(a) and (b) in the NBE; and
- the meaning of “promotes outcomes” for the benefit of the environment.
- The requirement to give effect to te Tiriti o Waitangi.

Transitional provisions and central government support for funding participation.

10. SDC considers that the Bills lack sufficient clarity regarding the transition to and implementation of the new system, as well as the status of the existing RM system and planning documents during this transition.

11. SDC’s District Plan is due for review under the existing RM system in 2014. This is a significant undertaking for a small Council both in terms of resourcing required and financially. SDC is keen to avoid any unnecessary duplication of planning processes and expense that might arise from undertaking a review under the existing RM system closely followed by a transition to the new system and requests clarity around how this is to be handled.

12. In particular, SDC submits that the NBE should be amended to provide further clarity regarding the following matters:

    a. The role and status of the RMA and existing RMA planning documents, following the enactment of the Bills and the NPF and RSS.

    b. SDC understands that the consenting requirements set out in plans prepared under the RMA will continue to apply until an RPC notifies its decisions on NBE plans. However it is unclear whether the NPF and any operative RSS must be considered in resource consent applications lodged under the RMA or whether applications made under the RMA must be assessed against the RMA legislation only. There will be a significant period of time between the implementation of the NPF and an RSS and the RPC decisions on NBE plans.

    c. The timing of the enactment of clause 2, Schedule 1 of the NBE and the impact of “subject to the NBEA”

    d. The impact of aspects of the NBEA that have commenced in relation to existing and ongoing RMA consenting.

Order of regions commencing new system

13. SDC also submit that further clarification and up-front communication is required regarding which regions are intended to be part of the initial pilot group and subsequent tranches, and the process and considerations for establishing the order in which regions will be required to start introducing the new system. It is critical that Councils are informed as soon as possible as to when the new system will be commenced in their region(s) so that this can be factored into planning and resourcing, particularly given the ongoing obligations under the RMA.

14. SDC falls within both the Taranaki and Manawatu-Whanganui regions and further submits that further clarification and communication is required regarding the transition of districts in multiple regions into the new system.

Incorporation of information from RMA planning documents

15. SDC supports the inclusion of clause 2, Schedule 1 of the SP Bill regarding the incorporation of information from RMA planning documents into regional spatial strategies.

16. SDC considers that clause 2, Schedule 1 of the SP Bill should be a mandatory requirement rather than a discretionary requirement, to ensure that where information meets the requirements of clause 2, that the Regional Planning Committee ("RPC") does incorporate this information into the RSS.

17. Accordingly, SDC seeks that clause 2(1), Schedule 1 of the SPB be amended to "A regional spatial strategy must incorporate the following from an operative RMA planning document…"

18. SDC also considers that the category of information that can be incorporated into RSS' could be further expanded or clarified.

Recommendations

19. Amendments be made to the NBE to provide further clarity regarding the transition from the RMA system and the status of planning documents during this transition, including but not limited to:

    a. The role and status of the RMA and existing RMA planning documents, following the enactment of the Bills and the NPF and relevant RSS.
    b. Whether the NPF and any operative RSS must be considered in resource consent applications lodged under the RMA (prior to RPC decisions on NBE plans).
    c. The timing of the enactment of Schedule 1, Subpart 1, clause 2 of the NBE and the impact of "subject to the NBEA".
    d. The impact of aspects of the NBEA that have commenced in relation to existing and ongoing RMA consenting.

20. The Bills be amended and/or further central government guidance be prepared to provide further clarity regarding which regions will be included in the pilot tranche and the order in which other regions will commence the transition and/or the process for establishing this order. With Plans at different stages of plan-making there also needs to sufficient flexibility to ensure that a bespoke regional process can be adopted that best fits this region's needs. Amendment to clause 2(1), Schedule 1 of the SP Bill to "A regional spatial strategy must incorporate the following from an operative RMA planning document…

Regional Planning Committees

Lack of accountability to Local Authorities

21. SDC supports LGNZ's concern regarding the RPC's lack of accountability to local authorities, who are required to fund and resource the RPC and to implement the plans developed by the RPC.

RPC membership

22. SDC notes that (as per clause 3(d) of Schedule 8 of the NBE) the composition arrangement for RPCs must ensure that "in the case of a region with multiple local authorities, the local authority membership of the committees has been agreed with consideration of the different populations of the individual local authorities and the desirability of applying some weighting in respect of that".

23. SDC seeks more certainty relating to composition arrangements and appointment policies, including the weight to be given to the relative populations of the individual local authorities, and consistency with the purpose and principles of local government in the provisions. It also considers that recognition should be given to the key planning issues in the region to ensure that key legislative requirements can be met.

24. SDC notes the challenges of determining both membership and funding arrangements equitably where there are members of different sizes and members who fall within multiple regions. It is important that RPC membership is both affordable and a vehicle that enables all members to contribute effectively to.

25. SDC falls within both the Taranaki and Manawatu-Whanganui regions. The district's population is not equally split across the two regions with most living within the Taranaki region. We would be the smallest member of both of the RPCs for our district. Because our population is comparatively small and further exacerbated by it being split between regions proportional representation on the RPCs is likely to present difficulties in terms of making an effective contribution. Similarly, insofar as funding the operation of the RPCs is concerned, all members making equal financial contributions to the funding of RPCs would be challenging for districts that straddle regional boundaries. This is especially so for small Councils where the cost would need to be met by a limited number of ratepayers.

Host Authority

26. SDC supports the Bill's current approach that does not specify a default position on hosting the RCP. SDC considers that the determination of the host authority should be based on a multitude of factors including resourcing, population and prior planning leadership experience and that this decision requires flexibility to account for region-specific considerations.

27. SDC considers that the working arrangements of the secretariat and host authority appear to be uncertain, complex and potentially unworkable, particularly with regards to funding, resourcing and employment matters and endorses the concerns raised in the LGNZ submission. Accordingly, SDC supports any further amendments to the Bills that provide more clarity regarding this system change and the appointment and operation of the host authority and secretariat. However, SDC also considers that sufficient flexibility will need to be retained in these provisions to allow for region-specific matters to be addressed.

Funding

28. SDC generally endorses the issues raised and recommendations sought in respect of funding and resourcing in the LGNZ submission. In particular, SDC considers that:

    a. the NBE lacks sufficient direction or clarity as to how funding contributions for the RPC are to be agreed. Currently, the NBE requires that all of the local authorities in the region "jointly fund" the RPCs and the secretariat. Where there are multiple local authorities, these authorities must work together in "good faith" to agree the amount of funding to be provided to the RPC, and the share of the funding to be provided by each authority. However, there is no further guidance beyond this. For example, the NBE provides for a process for determining a funding dispute, however does not specify factors to be considered in determining such a dispute which provides authorities with a lack of guidance and certainty;

    b. the NBE should include matters for consideration when authorities are agreeing funding contributions and/or when a Minister's appointee is making decisions on funding disputes; and

    c. central government should fund the reform and transition process, in particular funding for meaningful iwi and hapū engagement.

29. SDC considers that such clarifications would provide more certainty and direction for local authorities.

Recommendations

30. Retain or strengthen 3(d) of Schedule 8 of the NBE, regarding the consideration of the populations of local authorities and key legislative responsibilities in determining membership of the RPC.

31. Amendment of the NBE to provide further clarity regarding the appointment and operation of the host authority and secretariat.

32. Amendment of the NBE to provide further clarity regarding the agreement of funding contributions for the RPC, including:

    a. The minimum matters for consideration when authorities are agreeing funding contributions;

    b. the factors to be considered by a Minister's appointee in determining a funding dispute;

    c. The provision of more central government funding for the reform and transition process, particularly in regards to iwi and hapū participation.

NBE System Outcomes

33. SDC generally supports the inclusion and move towards to the provision of system outcomes (as set out in clause 5 of the NBE).

34. SDC supports the inclusion of system outcomes that provide for increased recognition of matters compared to the RMA – in particular, climate change, natural hazards and infrastructure outcomes.

35. However, SDC considers that the system outcomes contained in the NBE do not provide sufficient direction regarding urban development outcomes, noting that clause 5(c) of the NBE provides for a combined system outcome of "well-functioning urban and rural areas". As a consequence of the removal of the reference to amenity values and the need to favour "caution" proportionate to the level of environmental protection (the new decision making principle in clause 6(2)), unpacking what constitutes a "well-functioning urban area" will be challenging/up for debate. SDC considers that more direction is required within the system outcomes to support well-functioning urban development outcomes.

36. SDC understands from the NBE's explanatory text that the NPF is intended to provide further direction on each system outcome. SDC therefore acknowledges that the above suggested urban development direction could alternatively be included in the NPF. However, as set out below, as the NPF is not currently available for review, SDC is unable to confirm whether the further direction in the NPF will address SDC 's concerns regarding the lack of a comprehensive urban development system outcome.

37. SDC also endorse LGNZ's draft submission that there is a lack of direction or guidance in the NBE about how competing or conflicting outcomes will be managed. SDC understands that the NPF will provide further guidance on weighting of competing outcomes and national direction, however until the NPF does so, it is difficult to determine whether the Bill's system outcomes will be able to be effectively achieved.

38. SDC agrees with LGNZ's submission point that key conflicts should, if possible, be resolved in the NBE to ensure certainty, or at the least not left to the RPC and NBE plans (where these are national-level conflicts and not regional conflicts). Accordingly, we also agree that some flexibility should be retained to address local issues. SDC considers that if weighting guidance and direction is to be addressed in the NPF, then this strengthens the need for enhanced local authority involvement in the development of the NPF as discussed elsewhere within this submission.

Recommendations

39. Amendment of the NBE to include a standalone and more comprehensive urban development outcome, with further direction addressing the following matters:

    a. Development occurs in a cohesive, compact and structured way;
    b. Well-functioning urban form that provides for connected, liveable communities;
    c. Recognition that existing urban environments may change over time;
    d. Recognition that development enables greater productivity and economic growth and social and cultural vitality;
    e. Development meets the community's short, medium and long-term housing needs;

f. The provision of a variety of housing types, sizes and tenures in quality living environments to meet the community's diverse social and economic housing needs;
g. Well-designed, liveable, connected, accessible and safe spaces for the community to live, work and play;
h. Recognition of the local context and character of an area.

40. Further direction be included in the NBE regarding the resolution of conflicts between and the weighting of system outcomes.

Local community voice and input

41. SDC considers that the role and voice of Territorial Local Authorities (TLAs) in the proposed plan making process has been significantly reduced. TLAs are best placed to understand the unique challenges and opportunities within their districts, and accordingly should have a stronger role in plan making.

42. TLAs will also be responsible for funding and implementing the plans made under the new system, and accordingly should have an enhanced role in the plan making process.

43. Fundamentally, SDC is concerned that there will be a loss of good community outcomes if planning decisions are centralized, and the role of TLAs and planners is reduced. It would also serve to exacerbate the status quo whereby well-resourced submitters influence policy direction that may not address localised key resource management issues or reflect community aspirations. Planning is a multi-disciplinary profession and successful planning and implementation requires interaction between various arms and departments of local government, a function often provided by planners.

44. As such, SDC considers that the proposed changes to plan making may result in system inefficiencies based on the reality of local government structures and the interaction and multi-disciplinary approach required to implement plans.

45. SDC supports further involvement of TLAs in the process.

Statement of Community Outcomes (SCOs)

46. SDC generally supports the intent of SCOs (as captured by clause 107 and clause 14, Schedule 7 of the NBE and clause 24 of the SPB).

47. It is noted that Councils already develop Community Outcomes under the Local Government Act that support the strategic framework of Councils. Recognition and alignment of this requirement is requirement to ensure community outcomes developed under the LGA and RM reform are aligned and fit for purpose.

48. However, SDC is concerned that insufficient weight is placed on SCOs to ensure that they are an effective and meaningful mechanism for TLAs to contribute to plan making.

49. SDC considers that more clarity regarding the process, form and content of SCOs would be beneficial for local authorities and would create greater efficiencies in the planning processes under the Bills.

50. SDC agrees with LGNZ/s submission that the scope of SCOs is currently too weak and supports any further amendment to clarify and strengthen the scope and purpose of SCOs. Currently SCOs are intended to provide a summary of "the views of a district or local community" – SDC considers that this purpose is too high level. SDC encourages the amendment of the scope of SCOs to enable district councils to prescribe particular local matters or rules within plans.

51. SDC supports LGNZ's recommendation that the Bills be amended to require RPC's to "give effect" to SCOs, or alternatively at least a greater weighting than "have particular regard to". SCOs are the primary mechanism for councils to influence RPC planning decisions, and accordingly they should carry sufficient weight to ensure that there is appropriate local input into plan making.

IHP recommendations

52. SDC shares the concern with LGNZ that there is only a limited substantial role for local government in the Independent Hearing Panel process (IHP) (as a submitter). Accordingly, SDC supports any amendment that would enable enhanced local government input into the IHP process.

53. The LGNZ draft submission also recommends that the Independent Hearings Panel be required to ensure that their recommendations “give effect” to, or alternatively, are “not inconsistent with” SCOs. SDC supports this recommendation. As set out above, SDC does not consider that SCOs are provided with sufficient weight, as one of the primary mechanisms for territorial authority input into plan making.

54. SDC would also support and encourage an amendment to the NBE to require the RPC to seek advice from affected councils on any decision to accept or reject an IHP recommendation, and the provision of reasoning where the RPC does not adopt any comments or advice received from councils.

Recommendations

55. Amendment of the scope and purpose of SCOs to provide further direction and weight to these documents.

56. The amendment of the NBE to require RPC’s to “give effect” to SCOs, or alternatively a weighting greater than “have particular regard to” in preparing RSS’ and NBE plans.

57. The amendment of the NBE to require IHPs to ensure their decisions “give effect to”, or alternatively “are not inconsistent with” SCOs.

58. The amendment of the NBE requiring RPCs to seek advice from affected local authorities on any decision to accept or reject an IHP recommendation, and where the RPC does not adopt such advice, reasoning to be provided for this.

59. For clarity, SDC supports any other recommendations made by other submitters that provide for greater local authority and territorial authority input into the plan making process for the NBE and RSS, and any other high order documents under the new system.

Spatial planning and RSS process

60. SDC is generally supportive of regional spatial planning and the intent of the RSS (subject to the points raised in this submission). The Spatial Planning requirements will be of substantial benefit to areas such as Taranaki that have not under taken region wide spatial planning.

RSS planning process

61. SDC is concerned that while Schedule 4 of the SP sets out the “key process steps” to be taken in preparing an RSS, clause 30 provides the RPC with the ability to adopt its own preparation process.

62. SDC is concerned that there is insufficient TLA input into the development of the RSS. Accordingly, SDC is supportive of any amendments that provide more mandatory TLA input/consideration of local authority’s position in the “key process steps”. SDC considers that the need for more local authority input is strengthened by the fact that there are no appeal rights once an RSS is adopted.

63. This position is intensified by the fact that the RSS process does not have to include hearings (clause 35 states that the processed may include hearings). Clause 28 however requires that the RPC ensure that the RSS is based on robust and reliable evidence and other information that is proportionate to the level of detail required in the particular context. SDC is concerned that the failure to require hearings, or at least the opportunity for interested parties to be heard, limits the ability to ensure that the RSS is based on robust and reliable evidence. Further, SDC acknowledges that the RSS does not include appeal rights, including for interested parties. SDC considers that this strengthens the need for more meaningful and integrated local authority involvement in the RSS process.

64. There is a need for alignment of the Spatial Planning Bill with the Local Government Act to ensure that there is a clear distinction between statutory requirements. The Spatial Planning Bill's amendment to Section 76AA of the Local Government Act is misplaced. The effect of it is that Councils can only consult on issues with the public on the options that are consistent with the Regional Spatial Strategy. However, it does not mean that Councils can only choose from options consistent with the Regional Spatial Strategy. This means Council's would be consulting on only a subset of options that they can determine from.

65. Consequently Sections 77 and 79 also need to have similar amendments to ensure that Council's only consider options consistent with the Regional Spatial Strategy.

Recommendations

66. The "key process steps" in Schedule 4 of the SP be amended to include more local authority input.

67. The amendment of the NBE to require RPC's to "give effect" to SCOs, or alternatively a weighting greater than "have particular regard to" in preparing RSS'.

68. That there is better alignment between the Local Government Act and SP Bill.

National Planning Framework ("NPF")

69. SDC supports the LGNZ submission seeking a co-design process for the NPF with local government. Given the importance of the NPF, and that it will inform all further planning documents, SDC consider that it is vital that there is enhanced local authorities in the development of the NPF, to ensure that good community outcomes are achieved.

70. SDC understands that as drafted, the responsible Minister must engage with "individuals or organisations that the Minister considers representative of the local government sector" before notification of an NPF proposal. SDC considers that the extent of the engagement and who will be engaged is unclear. SDC submits that all local authorities in the relevant region must be engaged with in the pre-notification stage and that the Bill provide further clarity regarding what that engagement looks like and to ensure that the engagement is meaningful.

Recommendations

71. Amendment of the NPF process to provide more opportunities for local authorities to contribute to the preparation of the NPF.

72. Amendment of the NBE to require engagement with local authorities in the pre-notification stage and further clarity and direction regarding that engagement.

Consenting

73. SDC has not submitted in detail on the proposed consenting regime. However, SDC supports proposals for efficient and effective consenting processes. SDC also wishes to record its concern with the requirement that TLAs have as a consent authority and in implementing, administering and enforcing plans which have limited input from TLAs (noting in particular the requirement of clause 645 of the NBE to implement and administer the committee's plan and regional spatial strategy).

74. As set out throughout this submission, SDC considers that good community outcomes are achieved when plans have sufficient TLA and community input. SDC is concerned that the implementation of the consenting regime may provide difficulties where there is limited meaningful TLA input into plans which may result in a disconnection between the plan making and consenting/implementation functions of local government. Accordingly, SDC reiterates its submissions and recommendations set out above which request more mandatory TLA input into plan making.

Appendix 6

WORLD ECONOMIC FORUM

The Global Risks Report 2023

18th Edition

INSIGHT REPORT

In partnership with Marsh McLennan and Zurich Insurance Group

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Contents

Preface

Saadia Zahidi
Managing Director

Last year's *Global Risks Report* warned that a divergent economic recovery from the COVID-19 pandemic risked deepening divisions at a time when collaboration was urgently required to address looming global challenges. Yet despite hard-learned lessons around the interdependence of global risks, few would have anticipated the extent of instability that would soon unfold, this time driven by a new war in Europe.

The health and economic aftereffects of the pandemic have quickly spiraled into compounding crises. Carbon emissions have climbed, as the post-pandemic global economy fired back up. Food and energy have become weaponized by the war in Ukraine, sending inflation soaring to levels not seen in decades, globalizing a cost-of-living crisis and fueling social unrest. The resulting shift in monetary policy marks the end of an economic era defined by easy access to cheap debt and will have vast ramifications for governments, companies and individuals, widening inequality within and between countries.

As the conflict between Russia and Ukraine approaches one year, economies and societies will not easily rebound from continued shocks. In this year's Global Risks Perception Survey, more than four in five respondents anticipated consistent volatility over the next two years. The persistence of these crises is already reshaping the world that we live in, ushering in economic and technological fragmentation. A continued push for national resilience in strategic sectors will come at a cost – one that only a few economies can bear. Geopolitical dynamics are also creating significant headwinds for global cooperation, which often acts as a guardrail to these global risks.

The 18th edition of the *Global Risks Report* considers this backdrop of simmering geopolitical tensions and confluence of socioeconomic risks. It identifies the most severe perceived risks to economies and societies over the next two years. The world's collective focus is being channeled into the "survival" of today's crises: cost of living, social and political polarization, food and energy supplies, tepid growth, and geopolitical confrontation, among others.

Yet much-needed attention and resources are being diverted from newly emerging or rapidly accelerating risks to natural ecosystems, human health, security, digital rights and economic stability that could become crises and catastrophes in the next decade. A low-growth, low-investment and low-cooperation era further undermines resilience and the ability to manage future shocks. In recognition of growing complexity and uncertainty, the report also explores connections between these risks. The analysis focuses on a potential "polycrisis", relating to shortages in natural resources such as food, water, and metals and minerals, illustrating the associated socioeconomic and environmental fall-out through a set of potential futures.

The report is underpinned by our annual Global Risks Perception Survey, which brings together leading insights from over 1,200 experts across the World Economic Forum's diverse network. It draws on the collective intelligence of the world's foremost risk experts, including the Global Risks Advisory Board and the Chief Risk Officers Community, as well as thematic experts from academia, business, government, the international community and civil society. The report has also benefited greatly from the expertise of the World Economic Forum's platforms, which work daily to drive tangible, system-positive change for the long term. We are deeply grateful to our long-standing partners in the report's development: Marsh McLennan and Zurich Insurance Group.

The 2023 edition of the *Global Risks Report* highlights the multiple areas where the world is at a critical inflection point. It is a call to action, to collectively prepare for the next crisis the world may face and, in doing so, shape a pathway to a more stable, resilient world.

Overview of methodology

The **Global Risks Perception Survey (GRPS)** has underpinned the *Global Risks Report* for nearly two decades and is the World Economic Forum's premier source of original global risks data. This year's GRPS has brought together leading insights on the evolving global risks landscape from over 1,200 experts across academia, business, government, the international community and civil society. Responses for the GRPS 2022-2023 were collected from 7 September to 5 October 2022.

"Global risk" is defined as the possibility of the occurrence of an event or condition which, if it occurs, would negatively impact a significant proportion of global GDP, population or natural resources. The GRPS 2022-2023 included the following components:

- **Outlook** invited respondents to predict global volatility to provide context to the evolution of the global risks landscape.
- **Severity** assessed the perceived likely impact of global risks over a one-, two- and 10-year horizon, to illustrate the potential development of individual global risks over time.
- **Consequences** asked respondents to consider potential impacts of a risk arising, to highlight relationships between global risks and the potential for compounding crises.
- **Risk preparedness and governance** invited respondents to assess the current effectiveness of the management of global risks and reflect on which stakeholders are best placed to effectively manage them, to elicit opportunities for global action and collaboration.
- **Qualitative questions on risks** sourced expert knowledge to identify new and emerging risks.

Refer to Appendix A: Technical Notes: Global Risks Perception Survey 2022-2023 for more detail, including relevant definitions for each of the 32 global risks.

To complement GRPS data on global risks, the report also draws on the World Economic Forum's **Executive Opinion Survey (EOS)** to identify risks that pose the most severe threat to each country over the next two years, as identified by over 12,000 business leaders in 121 economies. When considered in context with the GRPS, this data provides insight into local concerns and priorities and points to potential "hot spots" and regional manifestations of global risks. Refer to Appendix B: Executive Opinion Survey: National Risk Perceptions for more detail.

Finally, the report integrates the views of leading experts to generate foresight and to support analysis of the survey data. The *Global Risks Report* harnesses contributions from over 40 colleagues across the World Economic Forum's platforms. Qualitative insights were also collected from over 50 experts from across academia, business, government, the international community and civil society through community meetings, private interviews and thematic workshops conducted from July to November 2022. These include the Global Risks Advisory Board and the Chief Risks Officers Community. Refer to Contributors for more detail.

Executive Summary

The first years of this decade have heralded a particularly disruptive period in human history. The return to a "new normal" following the COVID-19 pandemic was quickly disrupted by the outbreak of war in Ukraine, ushering in a fresh series of crises in food and energy – triggering problems that decades of progress had sought to solve.

As 2023 begins, the world is facing a set of risks that feel both wholly new and eerily familiar. We have seen a return of "older" risks – inflation, cost-of-living crises, trade wars, capital outflows from emerging markets, widespread social unrest, geopolitical confrontation and the spectre of nuclear warfare – which few of this generation's business leaders and public policy-makers have experienced. These are being amplified by comparatively new developments in the global risks landscape, including unsustainable levels of debt, a new era of low growth, low global investment and de-globalization, a decline in human development after decades of progress, rapid and unconstrained development of dual-use (civilian and military) technologies, and the growing pressure of climate change impacts and ambitions in an ever-shrinking window for transition to a 1.5°C world. Together, these are converging to shape a unique, uncertain and turbulent decade to come.

The *Global Risks Report 2023* presents the results of the latest Global Risks Perception Survey (GRPS). We use three time frames for understanding global risks. Chapter 1 considers the mounting impact of current crises (i.e. global risks which are already unfolding) on the most severe global risks that many expect to play out over the short term (two years). Chapter 2 considers a selection of risks that are likely to be most severe in the long term (10 years), exploring newly emerging or rapidly accelerating economic, environmental, societal, geopolitical and technological risks that could become tomorrow's

FIGURE A

Global risks ranked by severity over the short and long term

"Please estimate the likely impact (severity) of the following risks over a 2-year and 10-year period"

	2 years		10 years
1	Cost-of-living crisis	1	Failure to mitigate climate change
2	Natural disasters and extreme weather events	2	Failure of climate-change adaptation
3	Geoeconomic confrontation	3	Natural disasters and extreme weather events
4	Failure to mitigate climate change	4	Biodiversity loss and ecosystem collapse
5	Erosion of social cohesion and societal polarization	5	Large-scale involuntary migration
6	Large-scale environmental damage incidents	6	Natural resource crises
7	Failure of climate change adaptation	7	Erosion of social cohesion and societal polarization
8	Widespread cybercrime and cyber insecurity	8	Widespread cybercrime and cyber insecurity
9	Natural resource crises	9	Geoeconomic confrontation
10	Large-scale involuntary migration	10	Large-scale environmental damage incidents

Risk categories: Economic, Environmental, Geopolitical, Societal, Technological

Source

World Economic Forum Global Risks Perception Survey 2022-2023.

crises. Chapter 3 imagines mid-term futures, exploring how connections between the emerging risks outlined in previous sections may collectively evolve into a "polycrisis" centred around natural resource shortages by 2030. The report concludes by considering perceptions of the comparative state of preparedness for these risks and highlighting enablers to charting a course to a more resilient world. Below are key findings of the report.

Cost of living dominates global risks in the next two years while climate action failure dominates the next decade

The next decade will be characterized by environmental and societal crises, driven by underlying geopolitical and economic trends. **"Cost-of-living crisis"** is ranked as the most severe global risk over the next two years, peaking in the short term. **"Biodiversity loss and ecosystem collapse"** is viewed as one of the fastest deteriorating global risks over the next decade, and all six environmental risks feature in the top 10 risks over the next 10 years. Nine risks are featured in the top 10 rankings over both the short and the long term, including **"Geoeconomic confrontation"** and **"Erosion of social cohesion and societal polarisation"**, alongside two new entrants to the top rankings: **"Widespread cybercrime and cyber insecurity"** and **"Large-scale involuntary migration"**.

As an economic era ends, the next will bring more risks of stagnation, divergence and distress

The economic aftereffects of COVID-19 and the war in Ukraine have ushered in skyrocketing inflation, a rapid normalization of monetary policies and started a low-growth, low-investment era.

Governments and central banks could face stubborn inflationary pressures over the next two years, not least given the potential for a prolonged war in Ukraine, continued bottlenecks from a lingering pandemic, and economic warfare spurring supply chain decoupling. Downside risks to the economic outlook also loom large. A miscalibration between monetary and fiscal policies will raise the likelihood of liquidity shocks, signaling a more prolonged economic downturn and debt distress on a global scale. Continued supply-driven inflation could lead to stagflation, the socioeconomic consequences of which could be severe, given an unprecedented interaction with historically high levels of public debt. Global economic fragmentation, geopolitical tensions and rockier restructuring could contribute to widespread debt distress in the next 10 years.

Even if some economies experience a softer-than-expected economic landing, the end of the low interest rate era will have significant ramifications for governments, businesses and individuals. The knock-on effects will be felt most acutely by the most vulnerable parts of society and already-fragile states, contributing to rising poverty, hunger, violent protests, political instability and even state collapse. Economic pressures will also erode gains made by middle-income households, spurring discontent, political polarization and calls for enhanced social protections in countries across the world. Governments will continue to face a dangerous balancing act between protecting a broad swathe of their citizens from an elongated cost-of-living crisis without embedding inflation – and meeting debt servicing costs as revenues come under pressure from an economic downturn, an increasingly urgent transition to new energy systems, and a less stable geopolitical environment. The resulting new economic era may be one of growing divergence between rich and poor countries and the first rollback in human development in decades.

Geopolitical fragmentation will drive geoeconomic warfare and heighten the risk of multi-domain conflicts

Economic warfare is becoming the norm, with increasing clashes between global powers and state intervention in markets over the next two years. Economic policies will be used defensively, to build self-sufficiency and sovereignty from rival powers, but also will increasingly be deployed offensively to constrain the rise of others. Intensive geoeconomic weaponization will highlight security vulnerabilities posed by trade, financial and technological interdependence between globally integrated economies, risking an escalating cycle of distrust and decoupling. As geopolitics trumps economics, a longer-term rise in inefficient production and rising prices becomes more likely. Geographic hotspots that are critical to the effective functioning of the global financial and economic system, in particular in the Asia-Pacific, also pose a growing concern.

Interstate confrontations are anticipated by GRPS respondents to remain largely economic in nature over the next 10 years. However, the recent uptick in military expenditure and proliferation of new technologies to a wider range of actors could drive a global arms race in emerging technologies. The longer-term global risks landscape could be defined by multi-domain conflicts and asymmetric warfare, with the targeted deployment of new-tech weaponry on a potentially more destructive scale than seen in recent decades. Transnational arms control mechanisms must quickly adapt to this new security context, to strengthen the shared moral, reputational and political costs that act as a deterrent to accidental and intentional escalation.

Technology will exacerbate inequalities while risks from cybersecurity will remain a constant concern

The technology sector will be among the central targets of stronger industrial policies and enhanced state intervention. Spurred by state aid and military expenditure, as well as private investment, research and development into emerging technologies will continue at pace over the next decade, yielding advancements in AI, quantum computing and biotechnology, among other technologies. For countries that can afford it, these technologies will provide partial solutions to a range of emerging crises, from addressing new health threats and a crunch in healthcare capacity to scaling food security and climate mitigation. For those that cannot, inequality and divergence will grow. In all economies, these technologies also bring risks, from widening misinformation and disinformation to unmanageably rapid churn in both blue- and white-collar jobs.

However, the rapid development and deployment of new technologies, which often comes with limited protocols governing their use, poses its own set of risks. The ever-increasing intertwining of technologies with the critical functioning of societies is exposing populations to direct domestic threats, including those that seek to shatter societal functioning. Alongside a rise in cybercrime, attempts to disrupt critical technology-enabled resources and services will become more common, with attacks anticipated against agriculture and water, financial systems, public security, transport, energy and domestic, space-based and undersea communication infrastructure. Technological risks are not solely limited to rogue actors. Sophisticated analysis of larger data sets will enable the misuse of personal information through legitimate legal mechanisms, weakening individual digital sovereignty and the right to privacy, even in well-regulated, democratic regimes.

Climate mitigation and climate adaptation efforts are set up for a risky trade-off, while nature collapses

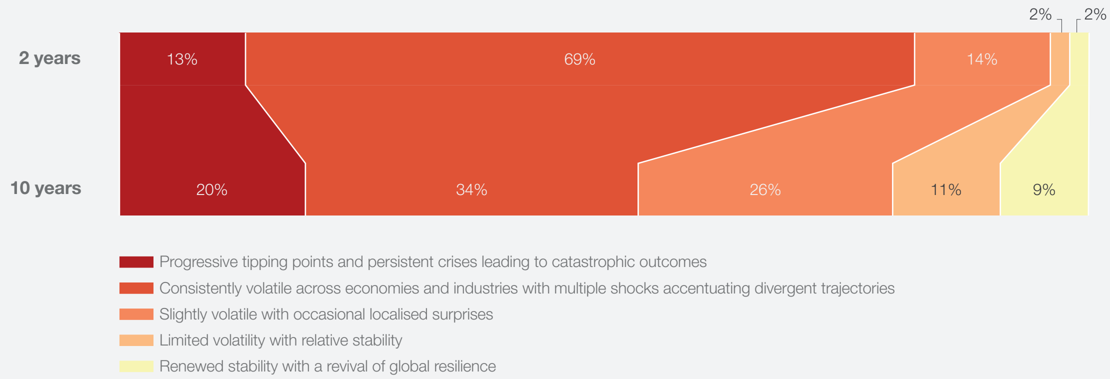
Climate and environmental risks are the core focus of global risks perceptions over the next decade – and are the risks for which we are seen to be the least prepared. The lack of deep, concerted progress on climate targets has exposed the divergence between what is scientifically necessary to achieve net zero and what is politically feasible. Growing demands on public-and private-sector resources from other crises will reduce the speed and scale of mitigation efforts over the next two years, alongside insufficient progress towards the adaptation support required for those communities and countries increasingly affected by the impacts of climate change.

As current crises diverts resources from risks arising over the medium to longer term, the burdens on natural ecosystems will grow given their still undervalued role in the global economy and overall planetary health. Nature loss and climate change are intrinsically interlinked – a failure in one sphere will cascade into the other. Without significant policy change or investment, the interplay between climate change impacts, biodiversity loss, food security and natural resource consumption will accelerate ecosystem collapse, threaten food supplies and livelihoods in climate-vulnerable economies, amplify the impacts of natural disasters, and limit further progress on climate mitigation.

FIGURE B

Short- and long-term global outlook

"Which of the following best characterizes your outlook for the world over the short-term (2 years) and longer-term (10 years)?



Source

World Economic Forum, Global Risks Perception Survey 2022-2023.

Food, fuel and cost crises exacerbate societal vulnerabilities while declining investments in human development erode future resilience

Compounding crises are widening their impact across societies, hitting the livelihoods of a far broader section of the population, and destabilizing more economies in the world, than traditionally vulnerable communities and fragile states. Building on the most severe risks expected to impact in 2023 – including **"Energy supply crisis"**, "**Rising inflation"** and **"Food supply crisis"** – a global **Cost-of-living crisis** is already being felt. Economic impacts have been cushioned by countries that can afford it, but many lower-income countries are facing multiple crises: debt, climate change and food security. Continued supply-side pressures risk turning the current cost-of-living crisis into a wider humanitarian crisis within the next two years in many import-dependent markets.

Associated social unrest and political instability will not be contained to emerging markets, as economic pressures continue to hollow out the middle-income bracket. Mounting citizen frustration at losses in human development and declining social mobility, together with a widening gap in values and equality, are posing an existential challenge to political systems around the world. The election of less centrist leaders as well as political polarization between economic superpowers over the next two years may also reduce space further for collective problem-solving, fracturing alliances and leading to a more volatile dynamic.

With a crunch in public-sector funding and competing security concerns, our capacity to absorb the next global shock is shrinking. Over the next 10 years, fewer countries will have the fiscal headroom to invest in future growth, green technologies, education, care and health systems. The slow decay of public infrastructure and services in both developing and advanced markets may be relatively subtle, but accumulating impacts will be highly corrosive to the strength of human capital and development – a critical mitigant to other global risks faced.

As volatility in multiple domains grows in parallel, the risk of polycrises accelerates

Concurrent shocks, deeply interconnected risks and eroding resilience are giving rise to the risk of polycrises – where disparate crises interact such that the overall impact far exceeds the sum of each part. Eroding geopolitical cooperation will have ripple effects across the global risks landscape over the medium term, including contributing to a potential polycrisis of interrelated environmental, geopolitical and socioeconomic risks relating to the supply of and demand for natural resources.

The report describes four potential futures centred around food, water and metals and mineral shortages, all of which could spark a humanitarian as well as an ecological crisis – from water wars and famines to continued overexploitation of ecological resources and a slowdown in climate mitigation and adaption. Given uncertain relationships between global risks, similar foresight exercises can help anticipate potential connections, directing preparedness measures towards minimizing the scale and scope of polycrises before they arise.

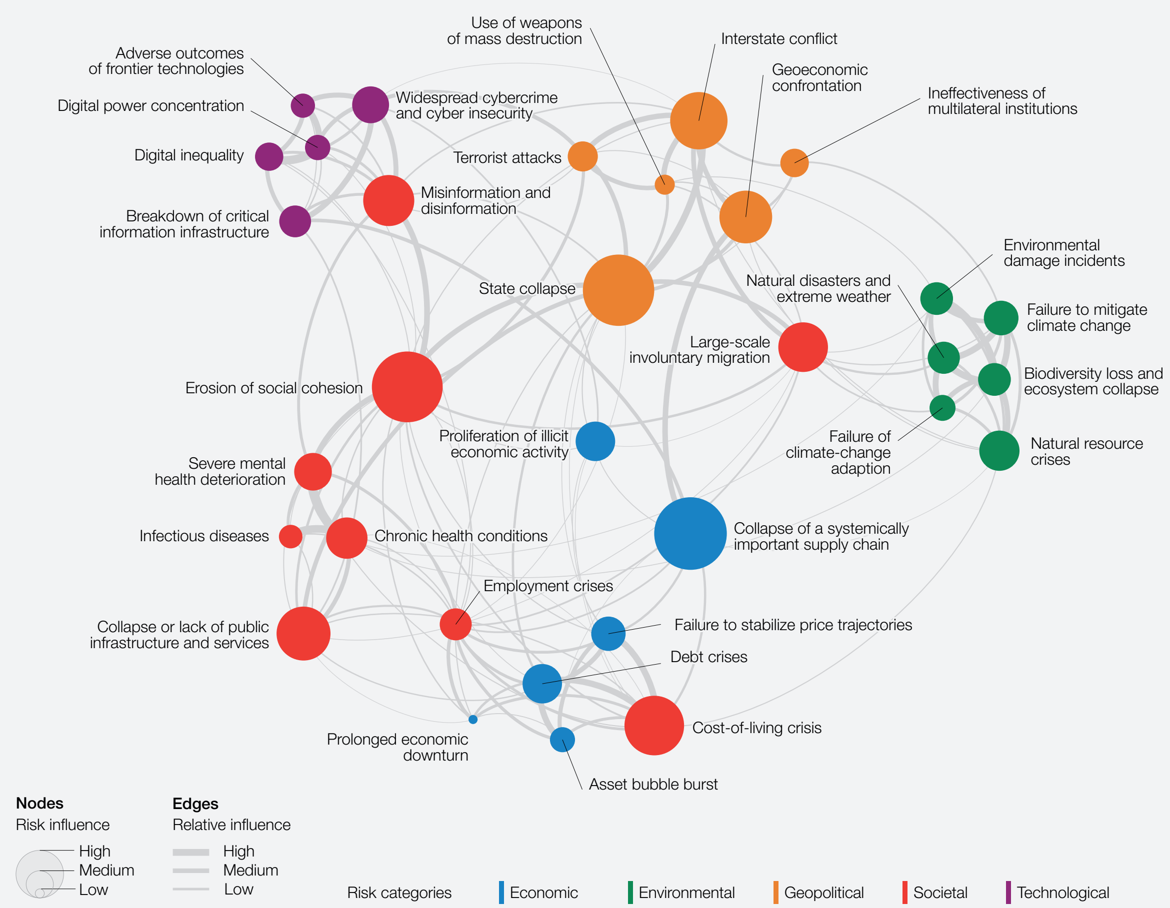
In the years to come, as continued, concurrent crises embed structural changes to the economic and geopolitical landscape, they accelerate the other risks that we face. More than four in five GRPS respondents anticipate consistent volatility over the next two years at a minimum, with multiple shocks accentuating divergent trajectories. However, respondents are generally more optimistic over the longer term. Just over one-half of respondents anticipate a negative outlook, and nearly one in five respondents predict limited volatility with relative – and potentially renewed – stability in the next 10 years.

Indeed, there is still a window to shape a more secure future through more effective preparedness. Addressing the erosion of trust in multilateral processes will enhance our collective ability to prevent and respond to emerging cross-border crises and strengthen the guardrails we have in place to address well-established risks. In addition, leveraging the interconnectivity between global risks can broaden the impact of risk mitigation activities – shoring up resilience in one area can have a multiplier effect on overall preparedness for other related risks. As a deteriorating economic outlook brings tougher trade-offs for governments facing competing social, environmental and security concerns, investment in resilience must focus on solutions that address multiple risks, such as funding of adaptation measures that come with climate mitigation co-benefits, or investment in areas that strengthen human capital and development.

Some of the risks described in this year's report are close to a tipping point. This is the moment to act collectively, decisively and with a long-term lens to shape a pathway to a more positive, inclusive and stable world.

FIGURE C

Global risks landscape: an interconnections map



Source

World Economic Forum, Global Risks Perception Survey 2022-2023.

FIGURE D

Currently manifesting risks

"Please rank the top 5 currently manifesting risks in order of how severe you believe their impact will be on a global level in 2023"

1. Energy supply crisis
2. Cost-of-living crisis
3. Rising inflation
4. Food supply crisis
5. Cyberattacks on critical infrastructure

Source

World Economic Forum Global Risks Perception Survey 2022-2023.

Risk categories: Economic | Environmental | Geopolitical | Societal | Technological

FIGURE E

Global risks ranked by severity

"Please estimate the likely impact (severity) of the following risks over a 2-year and 10-year period"

	Short term		Long term
1	Cost-of-living crisis	1	Failure to mitigate climate change
2	Natural disasters and extreme weather events	2	Failure of climate-change adaption
3	Geoeconomic confrontation	3	Natural disasters and extreme weather events
4	Failure to mitigate climate change	4	Biodiversity loss and ecosystem collapse
5	Erosion of social cohesion and societal polarization	5	Large-scale involuntary migration
6	Large-scale environmental damage incidents	6	Natural resource crises
7	Failure of climate-change adaption	7	Erosion of social cohesion and societal polarization
8	Widespread cybercrime and cyber insecurity	8	Widespread cybercrime and cyber insecurity
9	Natural resource crises	9	Geoeconomic confrontation
10	Large-scale involuntary migration	10	Large-scale environmental damage incidents
11	Debt crises	11	Misinformation and disinformation
12	Failure to stabilize price trajectories	12	Ineffectiveness of multilateral institutions and international cooperation
13	Prolonged economic downturn	13	Interstate conflict
14	Interstate conflict	14	Debt crises
15	Ineffectiveness of multilateral institutions and international cooperation	15	Cost-of-living crisis
16	Misinformation and disinformation	16	Breakdown of critical information infrastructure
17	Collapse of a systemically important industry or supply chain	17	Digital power concentration
18	Biodiversity loss and ecosystem collapse	18	Adverse outcomes of frontier technologies
19	Employment crises	19	Failure to stabilize price trajectories
20	Infectious diseases	20	Chronic diseases and health conditions
21	Use of weapons of mass destruction	21	Prolonged economic downturn
22	Asset bubble bursts	22	State collapse or severe instability
23	Severe mental health deterioration	23	Employment crises
24	Breakdown of critical information infrastructure	24	Collapse of a systemically important industry or supply chain
25	State collapse or severe instability	25	Severe mental health deterioration
26	Chronic diseases and health conditions	26	Collapse or lack of public infrastructure and services
27	Collapse or lack of public infrastructure and services	27	Infectious diseases
28	Proliferation of illicit economic activity	28	Use of weapons of mass destruction
29	Digital power concentration	29	Proliferation of illicit economic activity
30	Terrorist attacks	30	Digital inequality and lack of access to digital services
31	Digital inequality and lack of access to digital services	31	Asset bubble bursts
32	Adverse outcomes of frontier technologies	32	Terrorist attacks

Source

World Economic Forum Global Risks Perception Survey 2022-2023.

Risk categories: Economic | Environmental | Geopolitical | Societal | Technological

FIGURE F

Perceptions around preparedness and governance

Source

World Economic Forum, Global Risks Perception Survey 2022-2023.

1

Global Risks 2023: Today's Crisis

1.1 Current crises

With the global landscape dominated by manifesting risks, we introduce this year three time frames for understanding global risks: 1) current crises (i.e. global risks which are already unfolding), 2) risks that are likely to be most severe in two years, and 3) risks that are likely to be most severe in 10 years. This chapter address the outlook for the first two time frames. Most respondents to the

FIGURE 1.1

Currently manifesting risks

"Please rank the top 5 currently manifesting risks in order of how severe you believe their impact will be on a global level in 2023"

Source

World Economic Forum Global Risks Perception Survey 2022-2023.

2022-2023 Global Risks Perception Survey (GRPS) chose **"Energy supply crisis"**; **"Cost-of-living crisis"**; **"Rising inflation"**; **"Food supply crisis"** and **"Cyberattacks on critical infrastructure"** as among the top risks for 2023 with the greatest potential impact on a global scale (Figure 1.1). Those that are outside the top 5 for the year but remain concerns include: failure to meet net-zero targets; weaponization of economic policy; weakening of human rights; a debt crisis; and failure of non-food supply chains.

News headlines all over the world make these results largely unsurprising. Yet their implications are profound. Our global "new normal" is a return to basics – food, energy, security – problems our globalized world was thought to be on a trajectory to solve. These risks are being amplified by the persistent health and economic overhang of a global pandemic; a war in Europe and sanctions that impact a globally integrated economy; and an escalating technological arms race underpinned by industrial competition and enhanced state intervention. Longer-term structural changes to geopolitical dynamics – with the diffusion of power across countries of differing political and economic systems – are coinciding with a more rapidly changing economic landscape, ushering in a low-growth, low-investment and low-cooperation era and a potential decline in human development after decades of progress.

The result is a global risks landscape that feels both wholly new and eerily familiar. There is a return of "older" risks that are understood historically but experienced by few in the current generations of business leaders and public policy-makers. In addition, there are relatively new developments in the global risk landscape. These include widespread, historically high levels of public and in some cases private-sector debt; the ever more rapid pace of technological development and its unprecedented intertwining with the critical functioning of societies; and the growing pressure of climate change impacts and ambitions in an ever-shorter time frame for transition. Together, these are converging to shape a unique, uncertain and turbulent 2020s.

1.2 The path to 2025

The complex and rapid evolution of the global risks landscape is adding to a sense of unease. More than four in five GRPS respondents anticipated consistent volatility over the next two years at a minimum, with multiple shocks accentuating divergent trajectories (Figure 1.10).

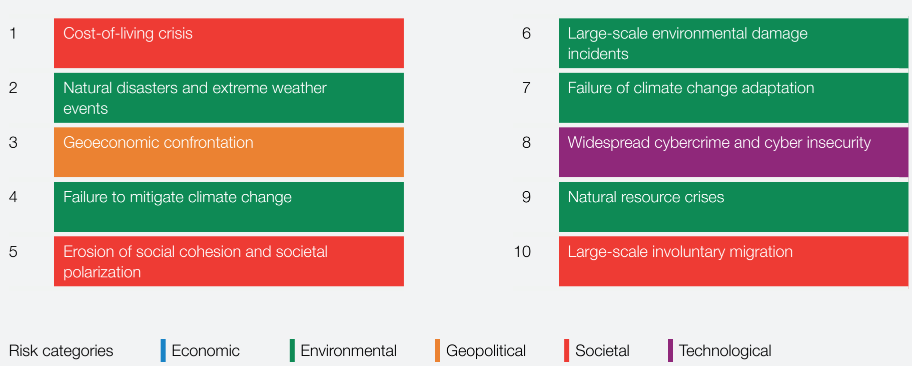
Respondents to the GRPS see the path to 2025 dominated by social and environmental risks, driven by underlying geopolitical and economic trends (Figure 1.2).

There were some notable differences between the responses of government and business respondents, with **"Debt crises"**, **"Failure to stabilize price trajectories"**, **"Failure to mitigate climate change"** and **"Failure of climate change adaptation"** featuring more prominently for governments, and **"Widespread cybercrime and cyber insecurity"** and **"Large-scale environmental damage incidents"** featuring higher for business (Figure 1.3).

The following sections explore the most severe

FIGURE 1.2

Global risks ranked by severity over the short term (2 years)



Source

World Economic Forum Global Risks Perception Survey 2022-2023.

FIGURE 1.3

Severity by stakeholder over the short term (2 years)

	Government	Business
1	Cost-of-living crisis	Cost-of-living crisis
2	Natural disasters and extreme weather	Natural disasters and extreme weather
3	Failure to mitigate climate change	Geoeconomic confrontation
4	Geoeconomic confrontation	Widespread cybercrime and cyber insecurity
5	Failure of climate-change adaption	Large-scale environmental damage incidents
6	Debt crises	Erosion of social cohesion and societal polarization
7	Erosion of social cohesion and societal polarization	Failure to mitigate climate change
8	Failure to stabilize price trajectories	Natural resource crises
9	Widespread cybercrime and cyber insecurity	Debt crises
10	Prolonged economic downturn	Failure of climate-change adaption

Risk categories: Economic, Environmental, Geopolitical, Societal, Technological

Source

World Economic Forum Global Risks Perception Survey 2022-2023.

global risks that many expect to play out over the next two years, within the context of the mounting impacts and constraints being imposed by the numerous crises felt today. These are: cost-of-living crisis, economic downturn, geoeconomic warfare, climate action hiatus and societal polarization. We describe current trends associated with each risk, briefly cover the reasons behind them and then note their emerging implications and knock-on effects.

Cost-of-living crisis

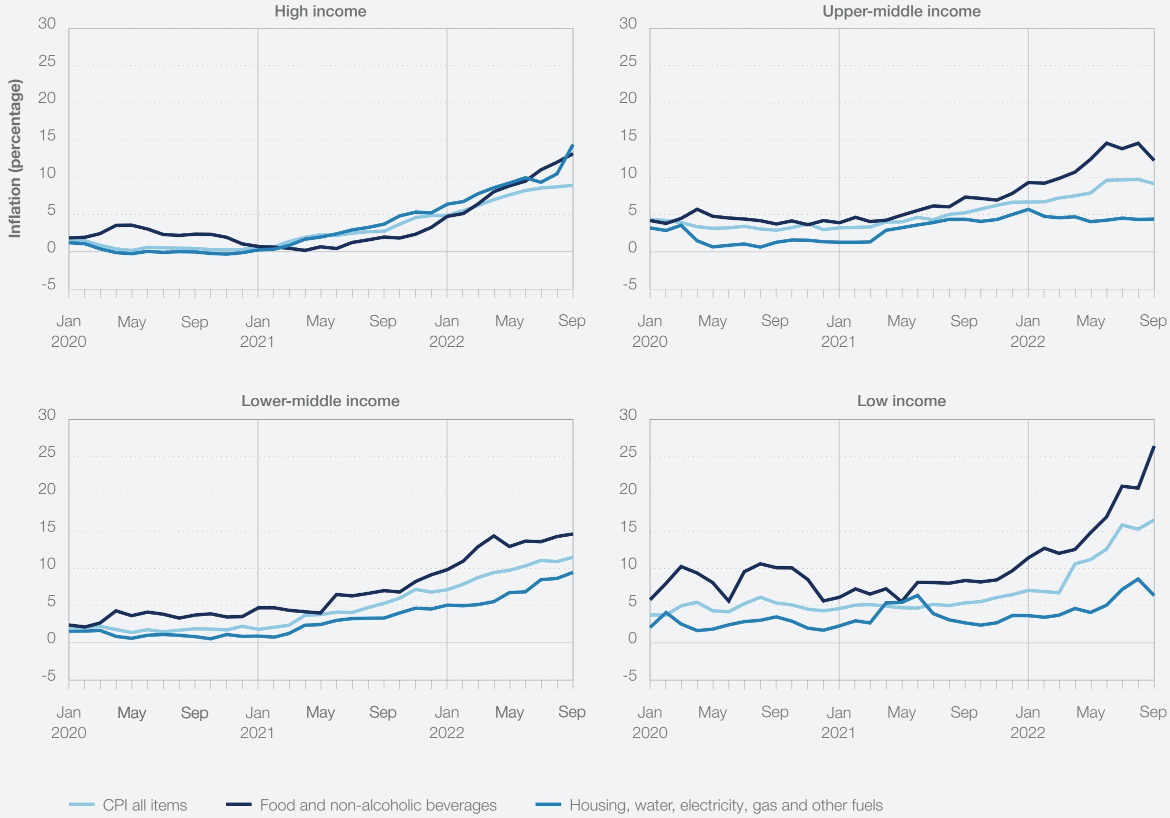
Ranked as the most severe global risk over the next two years by GRPS respondents, a global **Cost-of-living crisis** is already here, with inflationary pressures disproportionately hitting those that can least afford it. Even before the COVID-19 pandemic, the price of basic necessities – non-expendable items such as food and housing – were on the rise.[1] Costs further increased in 2022, primarily due to continued disruptions in the flows of energy and food from Russia and Ukraine. To curb domestic prices, around 30 countries introduced restrictions, including export bans, in food and energy last year, further driving up global inflation.[2] Despite the latest extension, the looming threat of Russia pulling out of the Black Sea Grain Export Deal has also led to significant volatility in the price of essential commodities.

Although global supply chains have partly adapted, with pressures significantly lower than the peak experienced in April last year,[3] price shocks to core necessities have significantly outpaced general inflation over this time (Figure 1.4). The FAO Price Index hit the highest level since its inception in 1990 in March last year.[4] Energy prices are estimated to remain 46% higher than average in 2023 relative to January 2022 projections.[5] The relaxation of China's COVID-19 policies could drive up energy and commodity prices further - and will test the resilience of global supply chains if policy changes remain unpredictable as infections soar.

Cost-of-living crisis was broadly perceived by GRPS respondents to be a short-term risk, at peak severity within the next two years and easing off thereafter. But the persistence of a global cost-of-living crisis could result in a growing proportion of the most vulnerable parts of society being priced out of access to basic needs, fueling unrest and political instability. Continued supply-chain disruptions could lead to sticky core inflation, particularly in food and energy. This could fuel further interest rate hikes, raising the risk of debt distress, a prolonged economic downturn and a vicious cycle for fiscal planning.

Despite some improvement during the pandemic, household debt has been on the rise in certain

FIGURE 1.4 **Price hikes in basic necessities, 2020-2022**



Source

IMF, Consumer Price Index.

Note

Median year-on-year inflation, by income group.

economies. Global mortgage rates have reached their highest level in more than a decade. Some estimates suggest that the increase in rates amounts to a 35% increase in mortgage payments for homeowners.[6] Rent inflation has also followed suit – in the United States of America, it is estimated to peak at over 8% in May this year before easing,[7] disproportionately affecting lower socioeconomic groups who are more likely to rent but least able to afford rental price hikes. Retirees will also be impacted as pensions fail to keep pace with higher inflation.[8] Higher costs of food, energy and housing, causing lower real incomes, will result in trade-offs in essential spending, worsening health and wellbeing outcomes for communities.

Economic impacts are often cushioned by expansive fiscal policy and government programmes in countries that can afford them.[9] Advanced economies continue to roll out measures, many of which have been broad-brush in approach – ranging from caps on electricity bills, fuel rebates and subsidized public transport tickets for consumers, to export controls on food, tax relief, enhanced state aid and support for affected companies. The resulting pressure on fiscal balances may exacerbate debt sustainability concerns, leaving emerging and developing countries with far less fiscal room to protect their populations in the future.

Both affordability and availability of basic necessities can stoke social and political instability. Last year, the increase in fuel prices alone led to protests in an estimated 92 countries, some of which resulted in political upheaval and fatalities, alongside strikes and industrial action.[10] The impact of insecurity will continue to be felt most acutely in already vulnerable states – including Somalia, Sudan, South Sudan and the Syrian Arab Republic – but may also exacerbate instability in countries facing simultaneous food and debt crises, such as Tunisia, Ghana, Pakistan, Egypt and Lebanon.[11]

A combination of extreme weather events and constrained supply could lead the current cost-of-living crisis into a catastrophic scenario of hunger and distress for millions in import-dependent countries or turn the energy crisis towards a humanitarian crisis in the poorest emerging markets. Energy shortages – as a result of supplier shut-offs or natural, accidental or intentional damage to pipelines and energy grids – could cause widespread blackouts and fatalities if combined with seasonal extreme weather. There is also a material possibility of a global food supply crisis occurring in 2023, with the continuation of the war in Ukraine, the lagged effect of a price spike in fertilizer last year and the impact of extreme weather conditions on food production in key regions. Estimates suggest that over 800,000 hectares of farmland were wiped out by floods in Pakistan – increasing commodity prices significantly in a country that was already grappling with record 27% inflation.[12] Predicted droughts and water shortages may cause a decline in harvests and livestock deaths across East Africa, North Africa and Southern Africa, exacerbating food insecurity.[13]

Although some regions anticipate above-average yields next year, unexpected production or transportation shocks in key exporters – including water shortages in the Netherlands and droughts and large-scale insect loss in the United States of America and Brazil[14] – or controls imposed by these countries could further destabilize global food security, explored in Chapter 3: Resource Rivalries. **"Severe commodity price shocks or volatility"** was a top-five risk over the next two years in 47 countries surveyed by the Forum's Executive Opinion Survey (EOS), while **"Severe commodity supply crises"** registered as a more localized risk, as a top-five concern across 34 countries, including in Switzerland, South Korea, Singapore, Chile and Türkiye. The catastrophic effects of famine and loss of life can also have spill-over effects further afield, as the risk of widespread violence grows and involuntary migration rises.

Economic downturn

Last year's edition of the *Global Risks Report* warned that inflation, debt and interest rate rises were emerging risks. Today, governments and central banks – led by developed markets, notably the United States of America, Eurozone and the United Kingdom of Great Britain – are walking a tightrope between managing inflation without triggering a deep or prolonged recession, and protecting citizens from a cost-of-living crisis while servicing historically high debt loads. Public-sector respondents to the GRPS ranked **Debt crises** (#6), **Failure to stabilise price trajectories** (#8) and **"Prolonged economic downturn"** (#10) in the top 10 risks over the next two years (Figure 1.3).

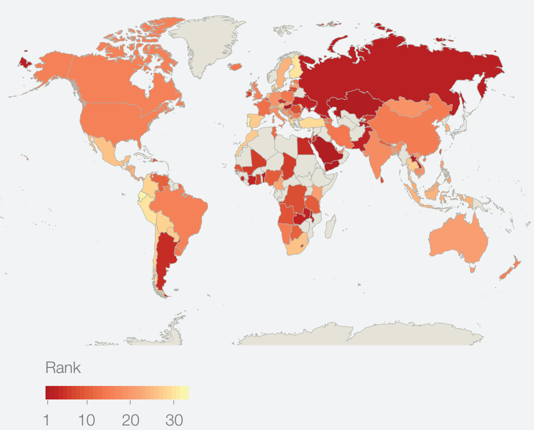
Managing inflation is a worldwide concern. **"Rapid and / or sustained inflation"** was also highlighted as a top-five risk over the next two years in 89 of the countries surveyed in the EOS, a significant increase from 2021 (Figure 1.5). It was ranked as the top threat in a number of G20 countries – including Brazil, South Korea and Mexico – although inflationary pressures have affected both developed and developing economies. Inflation rates rose above 80% in Argentina and Türkiye, while Zimbabwe, the Bolivarian Republic of Venezuela, Lebanon, the Syrian Arab Republic and Sudan witnessed triple-digit inflation. Inflation in the United States of America peaked above 9% in June last year and hit record highs in the United Kingdom of Great Britain and the Eurozone in October, at 11.1% and 10.6%, respectively, forcing interest rates higher and inflicting more pain on emerging economies.[15]

FIGURE 1.5

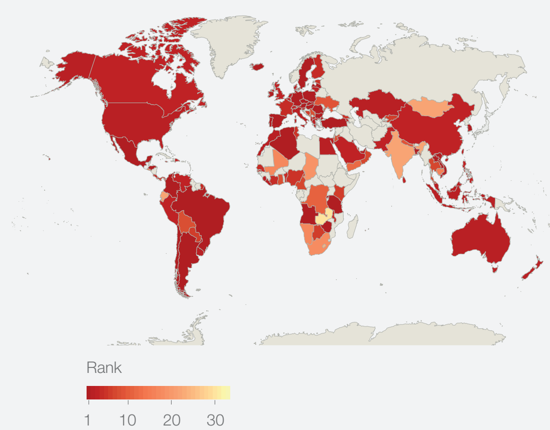
National risk perceptions: inflation

"Which five risks are the most likely to pose the biggest threat to your country in the next two years?"

A. Failure to stabilize price trajectories, 2021



B. Rapid and / or sustained inflation, 2022



Source

World Economic Forum Executive Opinion Survey 2022.

The IMF's most recent projections anticipate a decline in global inflation from almost 9% in 2022 to 6.5% this year and 4.1% in 2024, with a sharper disinflation in advanced economies.[16] However, downside risks to the outlook loom large. The complexity of inflationary dynamics is creating a challenging policy environment for both the public sector and central banks, given the mix of demand and supply-side drivers, including a prolonged war in Ukraine and associated energy-supply crunch, potential for escalating sanctions, and continued bottlenecks from a lingering pandemic or new sources of supply-side controls.

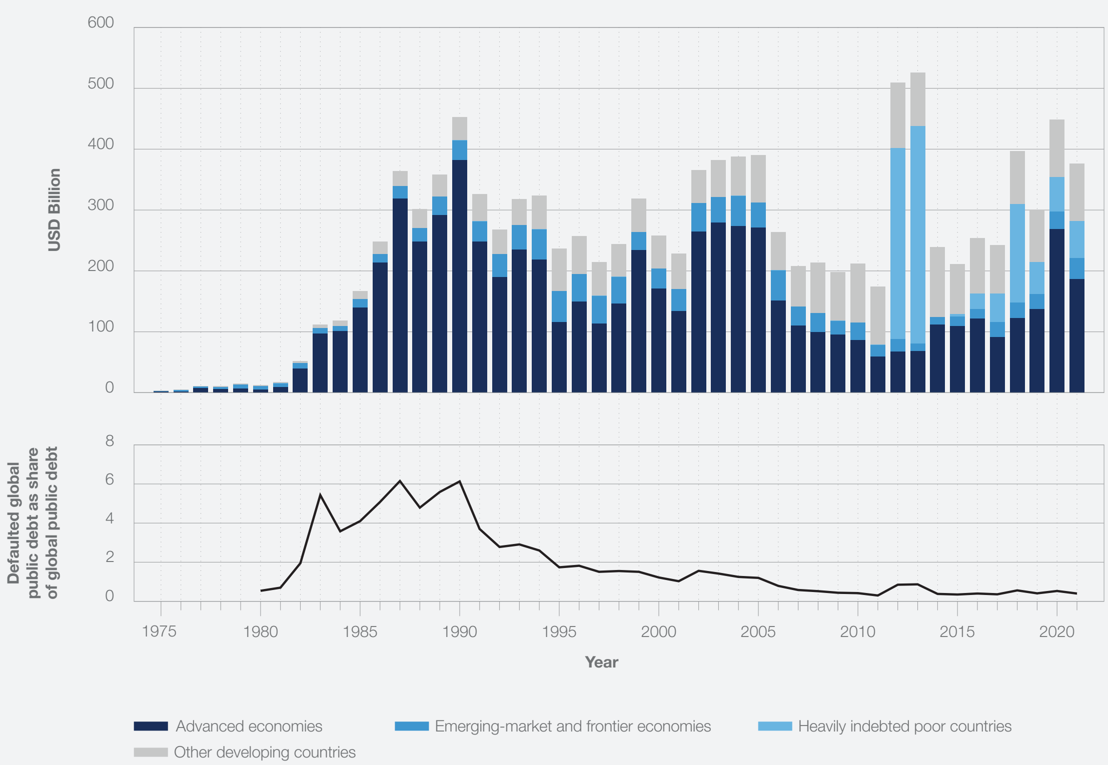
Given currently low headline unemployment in advanced economies, persistent price pressures will likely lead to higher interest rates to avoid inflation de-anchoring. Central banks have sped up the post-pandemic normalization of monetary policy. Nearly 90% (33 of 38) of central banks monitored by the Bank for International Settlements raised interest rates in 2022, a dramatic shift away from the loose financial conditions that characterized the previous decade.[17] With a rapid rise in rates, the risk of unintended consequences and policy error is high, with possible overshoot leading to a deeper and more prolonged economic downturn and potential global recession.

Even if the economic fallout remains comparatively contained, global growth is forecast to slow to 2.7% in 2023, with around one-third of the world's economy facing a technical recession – the third-weakest growth profile in over 20 years.[18] This downturn will be led by advanced markets, with projected growth falling to 1.1% in 2023, while the largest economies – the EU, China and the United States of America – face continued challenges to growth. However, for developing economies, there is a risk of further economic distress and tougher trade-offs. Stubbornly high inflation and more disorderly containment will raise the likelihood of stagnant economic growth, liquidity shocks and debt distress on a global scale. Energy importers in particular will bear the brunt of higher energy prices stemming from a strengthened US dollar, but its continued strength is importing inflation worldwide.

Globalized capital flows over recent decades have increased exposure of emerging and developing markets to rising interest rates, especially those with a high proportion of USD-denominated debt, such as Argentina, Colombia and Indonesia.[19] Early tightening of monetary policy in many markets – including Brazil, Mexico, Chile, Peru and Colombia – minimized initial exposure. But while some countries have resorted to foreign-exchange interventions

FIGURE 1.6

Sovereign debt in default



Source

Bank of Canada and Bank of England, 2022.[20]

to limit currency depreciation and debt-servicing loads, heightened volatility continues to drive demand for US assets. This has led to record capital outflows from markets with weaker macroeconomic fundamentals, with investors already withdrawing $70 billion from emerging market bond funds by October last year.[21]

Growth agendas, including the critical pivot to greener economies, have been based on the availability of cheap debt. The extent to which countries can continue to finance development will be dependent on domestic political and debt dynamics. Sri Lanka's recent crisis provides a very real example of the spiraling risks to human security and health that can arise from economic distress, where a debt default and shortage in foreign currency limited imports; disrupted access to food, fuel, healthcare and electricity; and led to violent protests and the resignation of the President.

The scale of sovereign debt defaults could significantly rise in weaker emerging markets over the next two years, in terms of both the percentage value of total global debt and number of states in default (Figure 1.6). Although unlikely under the current trajectory to reach globally destabilizing levels, the proportion of countries in or at high risk of debt distress has already doubled from 2015 levels.[22] This will increase the global influence of creditor nations and heighten state fragility as the capacity to address simultaneous crises in food and energy will be limited.[23] Some countries will be unable to contain future shocks, invest in future growth and green technologies or build future resilience in education, healthcare and ecological systems, with impacts exacerbated by the most powerful and disproportionately borne by the most vulnerable, as explored in **Chapter 2.6: Economic stability**.

Geoeconomic warfare

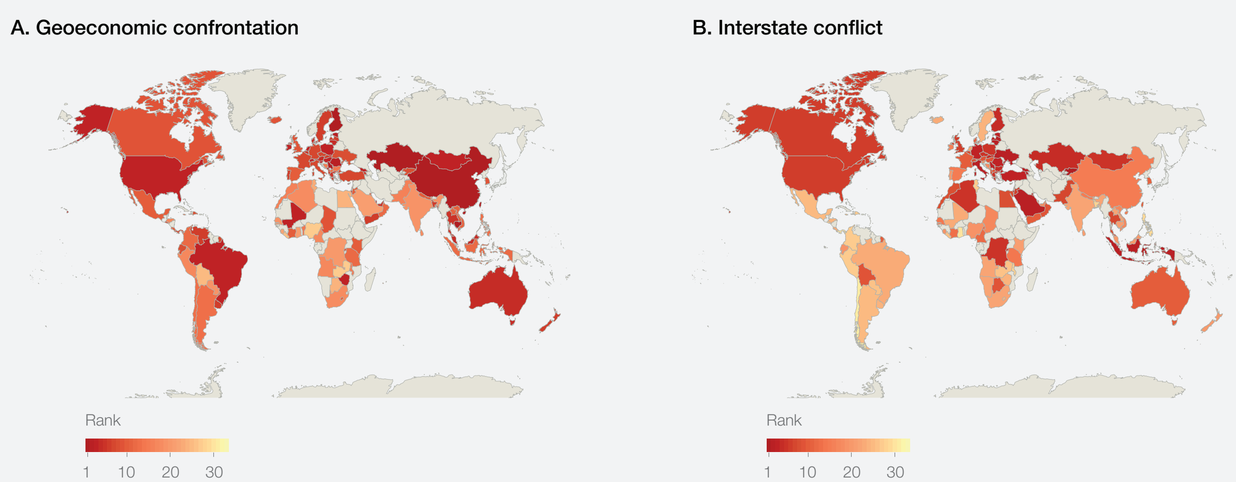
"Geoeconomic confrontation" was ranked the third-most severe risk over the next two years by GRPS respondents. Interstate confrontations were anticipated by both GRPS and EOS respondents to remain largely economic in nature over the short term. **Geoeconomic confrontation** – including sanctions, trade wars and investment screening – was considered a top-five threat over the next two years among 42 countries surveyed by the EOS and featured as the top risk in many East and South-East Asian countries, among others. In comparison, **"Interstate conflict"** was ranked as a top-five risk in 28 countries surveyed by the EOS (Figure 1.7).

The weaponization of economic policy between globally integrated powers has highlighted vulnerabilities posed by trade, financial and technological interdependence - for the public and private sector alike. The Ukraine conflict triggered the imposition of sanctions, nationalization of key players, and government appropriation of assets, such as Germany's seizure of Russian energy companies' stakes in local refineries last year.[24] Reputational and legal risks for multinational company operations in certain markets also grew:

FIGURE 1.7

National risk perceptions: interstate confrontation

"Which five risks are the most likely to pose the biggest threat to your country in the next two years?"



Source

World Economic Forum Executive Opinion Survey 2022.

consumer good companies faced boycotts after continuing to provide basic necessities to Russia, and a European energy company was accused of "complicity in war crimes" due to linkages to a Russian gas field.[25]

In the face of vulnerabilities highlighted by the pandemic and then war, economic policy, particularly in advanced economies, is increasingly directed towards geopolitical goals. Countries are seeking to build "self-sufficiency", underpinned by state aid, and achieve "sovereignty" from rival powers, through onshoring and "friend-shoring" global supply chains. Defensive measures to boost local production and minimize foreign interference in critical industries include subsidies, tighter investment screening, data localization policies, visa bans and exclusion of companies from key markets.

While initially driven by tensions between the United States of America and China, many policies are extra-territorial in nature or have been similarly adopted by other markets, with spill-over effects across a broad range of industries. For example, Switzerland is considering the introduction of a general cross-sectoral foreign direct investment screening regime for the first time. Expanded state aid to support self-sufficiency in "strategically important products", including climate mitigation and adaptation, has also heightened competition within global blocs. The EU has already raised concerns about the USA's Inflation Reduction Act, which includes significant tax credits and subsidies for local green technologies.[26]

Economic levers are also being used to proactively constrain the rise of rivals. This includes delisting of foreign companies, extensive use of the foreign direct product rule and export controls on key technologies and intellectual property as well as broad constraints on citizens and entities working with designated foreign companies. The introduction of an outbound investment screening regime has also been contemplated by the United States of America.[27]

Together, these trends towards geoeconomic warfare risk creating widespread spillovers. More extensive deployment of economic levers to meet geopolitical goals risks a vicious and escalating cycle of distrust. Financial and technological ramifications may highlight further vulnerabilities, leading states to proactively wind back other interdependencies in the name of national security and resilience over the next two years. This may spur contrary outcomes to the intended objective, driving resilience and productivity growth lower and marking the end of an economic era characterized by cheaper and globalized capital, labour, commodities and goods.

This will likely continue to weaken existing alliances as nations turn inwards, with enhanced state intervention perceived to drive a "race to the bottom". Further pressure will be placed on multilateral governance mechanisms that act as mitigants to these risks, potentially mirroring the politicization of the World Health Organization (WHO) during the COVID-19 pandemic and the near paralysis of trade enforcement on more contentious issues by the World Trade Organization (WTO) in recent years.[28] It will also likely embed the importance of broader geopolitical spheres of influence in "dependent" markets, with global powers extensively exercising trade, debt and technological power. Although some developing and emerging markets may wield critical resources as leverage, considered in **Chapter 3: Resource Rivalries**, anticipated controls on capital, labour, knowledge and technological flows risk widening the developmental divide.

In addition, spheres of influence will not be purely contained to global powers, nor "dependent" developing and emerging markets. The influence and alignment of the Middle East in regional and global politics will shift. Although the challenge of longer-term economic diversification remains a significant distraction domestically, the current energy crisis will raise economic, military and political capital of numerous countries over the next two years. Comparative ties of the United States of America and China will have significant ramifications for the balance of power in the region, as well as global military dynamics, considered further in **Chapter 2.4: Human security**.[29]

Strategies to enhance security may also come at a wider economic cost. Intensified geopolitical tensions risk weakening the economic landscape even further, resulting in lingering inflation or depressed growth even if current pressures subside. If on- and friend-shoring continue to be prioritized – particularly in strategic industries such as technology, telecommunications, financial systems, agriculture, mining, healthcare and pharmaceuticals – consumers will potentially face rising costs well into the future. As costs of compliance with divergent political and economic systems climb, multinational companies may pragmatically pick a side, speeding up divergence between various market models.

While intended to lower risks associated with geopolitical and economic disruption, shortened supply chains may also unintentionally heighten exposure to geographically concentrated risks, including labour shortages, civil unrest, pandemics and natural weather events. Geopolitical risks posed by geographic hotspots that are critical to the effective functioning of the global financial and economic system, in particular in the Asia-Pacific, also pose a growing concern.

Climate action hiatus

Despite 30 years of global climate advocacy and diplomacy, the international system has struggled to make the required progress on climate change. The potential failure to address this existential global risk first entered the top rankings of the *Global Risks Report* over a decade ago, in 2011. Today, atmospheric levels of carbon dioxide, methane and nitrous oxide have all reached record highs. Emission trajectories make it very unlikely that global ambitions to limit warming to 1.5°C will be achieved.[30]

A **Failure to mitigate climate change** is ranked as one of the most severe threats in the short term but is the global risk we are seen to be the least prepared for, with 70% of GRPS respondents rating existing measures to prevent or prepare for climate change as **"ineffective"** or **"highly ineffective"** (Figure 4.1). According to the Intergovernmental Panel on Climate Change (IPCC), the chance of breaching the 1.5°C target by as early as 2030 stands at 50%. Current commitments made by the G7 private sector suggest an increase of 2.7°C by mid-century, way above the goals outlined in the Paris Agreement.[31]

Recent events have exposed a divergence between

what is scientifically necessary and what is politically expedient. Current pressures should result in a turning point, encouraging energy-importing countries to invest in "secure", cleaner and cheaper renewable energy sources.[32] Yet geopolitical tensions and economic pressures have already limited – and in some cases reversed – progress on climate change mitigation, at least over the short term. For example, the EU spent at least EUR50 billion on new and expanded fossil-fuel infrastructure and supplies, and some countries restarted coal power stations.[33]

Despite some longer-term government action on the energy transition, such as the USA's Inflation Reduction Act and the EU's REPowerEU plan, overall momentum for climate mitigation is unlikely to rapidly accelerate in the next two years. Negotiations at the Conference of the Parties of the UNFCCC (COP27) failed to reach a much-needed agreement to phase out all fossil fuels, laying bare the difficulty of balancing short-term needs with longer-term ambitions. Policy-makers are increasingly confronted by perceived trade-offs between energy security, affordability and sustainability. The stark reality of 600 million people in Africa without access to electricity illustrates the failure to deliver change to those who need it and the continued attraction of quick fossil-fuel powered solutions – despite the risks of stranded assets, energy security challenges of exported fossil fuel commodities and lifetime carbon emissions that exceed the 1.5°C limit.

There is also growing recognition that not only the pace of the transition but also effectiveness and integrity matter: climate litigation is increasing and concerns about emissions under-reporting and greenwashing have triggered calls for new regulatory oversight for the transition to net zero.[34] While some countries have made disclosure mandatory, much of the corporate world have not yet assessed or started to manage their climate risks. In the absence of clearer policy signals and consistent regulation and enforcement, mitigation efforts will be shaped by increasingly disruptive climate activism, raising the likelihood of stranded assets – as well as people. A just transition that supports those set to lose from decarbonization is increasingly invoked by countries heavily dependent on fossil-fuel industries as a reason to slow down efforts. These challenges, against the backdrop of a deteriorating economic landscape and inflated input costs, may postpone investments in greener production methods – particularly in heavier, "dirtier" industries.[35]

All of this implies that the risks of a slower and more disorderly transition (extensively covered in last year's Global Risks Report) have now turned into reality, potentially leading to dire planetary and societal consequences. Any rollback of government and private action will continue to amplify risks to human health (explored in **Chapter 2.3: Human health**) and spur the deterioration of natural capital, as discussed in **Chapter 2.2: Natural ecosystems**. Climate change will also increasingly become a key migration driver and there are indications that it has already contributed to the emergence of terrorist groups and conflicts in Asia, the Middle East and Africa.[36]

Indeed, with 1.2°C of warming already in the system, the compounding effect of a changing climate is already being felt, magnifying humanitarian challenges such as food insecurity, and adding another hefty bill to already stretched fiscal balances.[37] In the GRPS results, **"Natural disasters and extreme weather events"** was considered the second-most severe risk over the next two years. As with many of the global risks featured in this year's report, the impact of these events disproportionately affects low- and middle-income countries. It registered as a top-five risk in 25 countries surveyed by the EOS, in particular in developing coastal states across Latin America, Africa and South-East Asia.

As floods, heatwaves, droughts and other extreme weather events become more severe and frequent, a wider set of populations will be affected. In parallel, a consolidation of public- and private-sector resources may set up emerging and pressing trade-offs between disaster recovery, loss and damage, adaptation and mitigation. Although climate mitigation has been overwhelmingly favoured over adaptation in terms of financing to date, particularly in the private sector,[38] EOS results indicate that climate adaptation may now be seen as a more immediate concern in the short term by business leaders. **Failure of climate change mitigation** only featured in the top five risks over the next two years in one economy, Zambia, whereas the **Failure of climate-change adaptation** was a top-five risk in 16 countries, such as the Netherlands, where it ranked first (Figure 1.8). The diversion of attention and resources towards adaptation may further slow progress on global-warming targets in the economies that remain the biggest contributors to greenhouse gas (GHG) emissions.[39]

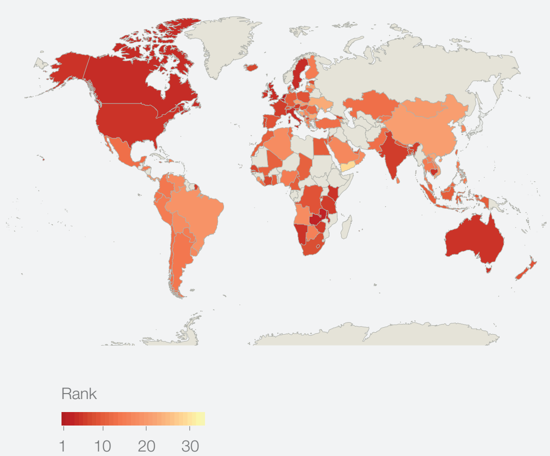
Despite plans for a global goal on adaptation to be agreed at COP28, there has also been insufficient progress towards the support required for infrastructure and populations already affected by the fallout from climate change. Adaptation has not been adequately funded, with 34% of climate finance currently allocated to adaptation worldwide.[40]

FIGURE 1.8

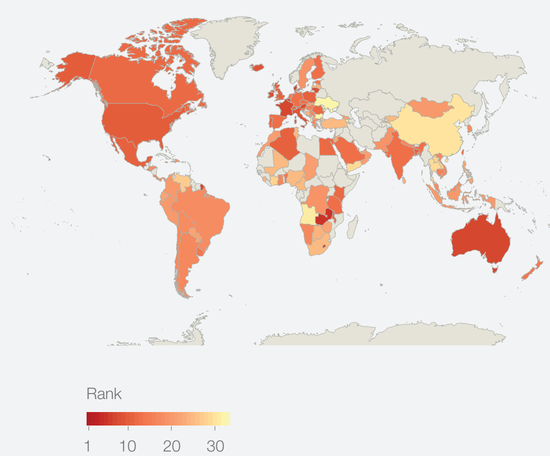
National risk perceptions: climate action

"Which five risks are the most likely to pose the biggest threat to your country in the next two years?"

A. Failure of climate-change adaptation



B. Failure of climate-change mitigation



Source

World Economic Forum Executive Opinion Survey 2022.

Nor do new investments in infrastructure or capital allocation decisions adequately consider current and future risks. Investors and policy-makers are locking themselves into costly futures, likely to be borne by the most vulnerable. Disagreements on what constitutes adaptation, and the lack of shared goals and best practices, robust regulatory frameworks and metrics, add to a high risk of overshooting and undershooting adaptation efforts.

Limits to adaptation are also increasingly evident. This has been highlighted by the Loss and Damage agenda which, after decades on the sidelines of the climate discourse, has now reached the mainstream. A new financing mechanism was tentatively agreed at COP27, although the contribution to this fund by high-emitting economies remains unclear. Even as more funding is unlocked, there is a risk of ignoring or avoiding climate-proofing against future disasters, as governments scramble to provide relief and support in disaster-hit areas. Market-based mechanisms for managing financial shocks are inadequate and may diminish further within the next two years. There is a risk of retreat by insurers from some areas of natural catastrophe coverage, with the gap in insurance estimated to have grown from $117 billion in 2020 to $161 billion in 2021.[41] Only 7% of economic losses from flood events in emerging markets – and 31% in advanced economies – have been covered by insurance in the last 20 years.[42]

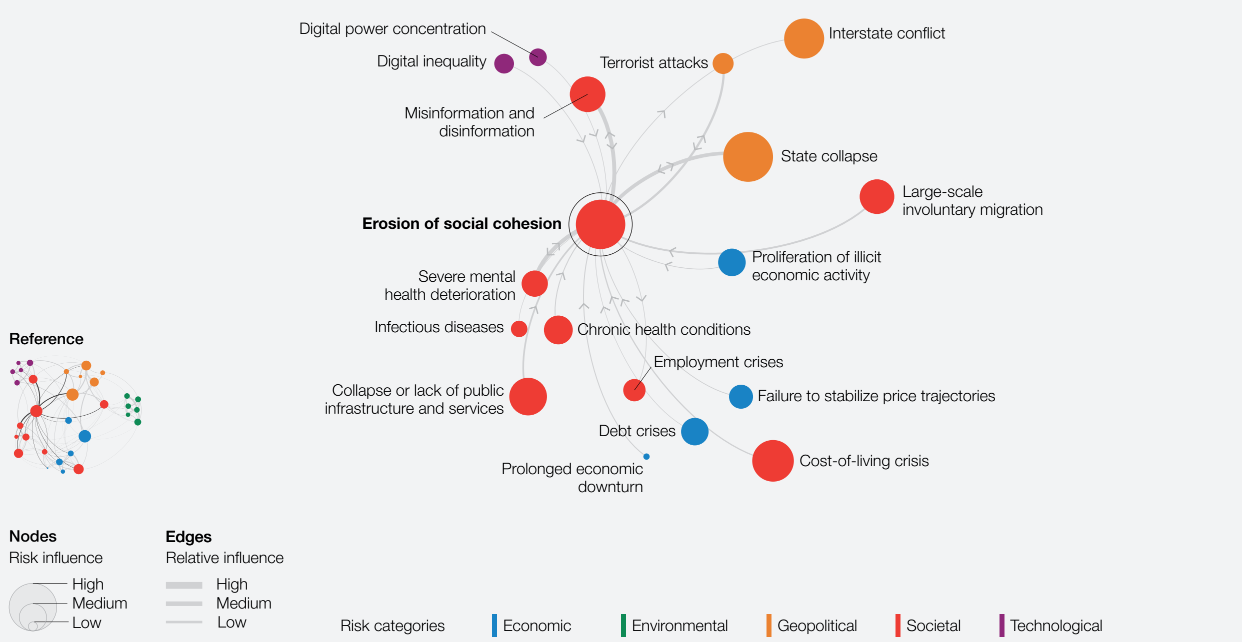
Societal polarization

"Erosion of social cohesion and societal polarisation" has been climbing in the ranks of perceived severity in recent years.[43] Defined as the loss of social capital and fracturing of communities leading to declining social stability, individual and collective wellbeing and economic productivity, it ranked as the fifth-most severe global risk faced in the short term by GRPS respondents. It was also seen as one of the most strongly influenced risks in the global network, triggered by many other short- and longer-term potential risks – including debt crises and state instability, cost-of-living crises and inflation, a prolonged economic downturn and climate migration (Figure 1.9).

A widening gap in values and equality is posing an existential challenge to both autocratic and democratic systems, as economic and social divides are translated into political ones. Polarization on issues such as immigration, gender, reproductive rights, ethnicity, religion, climate and even secession and anarchism[44] have characterized recent elections, referendums and protests around the world – from the United States of America and China to the Islamic Republic of Iran. Mounting citizen frustration at perceived gaps in direct governmental action, human development and social mobility manifested

FIGURE 1.9

Risk interconnections: the erosion of social cohesion



Source

World Economic Forum, Global Risks Perception Survey 2022-2023.

in frequently divisive and unruly civil protests last year. More protests were observed between January and October than in all of 2021.[45]

Consequences of societal polarization are vast, ranging from a drag on growth to civil unrest and deepening political fissures. And there are indications that increasing polarization is contributing to the decline of democracies and accompanying rise in hybrid regimes, with the share of the world's population living in autocratizing countries rising from 5% in 2011, to 36% in 2021. Only 13% of the world's population are currently living under a liberal democracy, compared to 44% living under an electoral autocracy.[46]

The erosion of the social and political centre risks becoming self-perpetuating. Divisions incentivize the adoption of short-term, more extreme policy platforms to galvanize one side of the population and perpetuate populist beliefs. Notably, the contest between two, non-centrist candidates or positions is often close.[47] Although heralded as a resurgence of leftist movements, the Brazilian presidential election of 2022 was won by President Lula by 1.8 points – the slimmest margin recorded since it became a democratic nation.[48] As such, a large proportion of the population can feel alienated and angered by leadership in the following term, acting as a multiplier to existing societal concerns and civil unrest. This is further amplified by social media, which increases polarization and distrust in institutions alongside political engagement.[49]

"Misinformation and disinformation" are, together, a potential accelerant to the erosion of social cohesion as well as a consequence. With the potential to destabilize trust in information and political processes,[50] it has become a prominent tool for geopolitical agents to propagate extremist beliefs and sway elections through social media echo chambers. It was perceived as a moderately severe risk by GRPS respondents, ranking 16th over the short term. Regulatory constraints and educational efforts will likely fail to keep pace, and its impact will expand with the more widespread usage of automation and machine-learning technologies, from bots that imitate human-written text to deepfakes of politicians.[51]

Polarization undermines social trust and, in some cases, has reflected power struggles within a political elite more than underlying divisions in ideologies.[52] Often, hardened polarization on key issues lead to government gridlocks. "Swings" between parties each electoral cycle may stymie the adoption of a longer-term policy outlook, causing greater strife, especially when navigating the difficult and uncertain economic outlook of the coming years. Additionally, although less likely in more democratically robust states, an increasing presence of anocracies (those forms of government that are part democracy, part autocracy, referred to in Chapter 2.5: Digital rights) and factionalism may radicalize polarization. This could lead to increased incidences of threat campaigns and political violence, hate crimes, violent protests and even civil war.[53]

Social and political polarization may also further reduce the space for collective problem-solving to address global risks. The far right has been elected in Italy and are now the second largest party in Sweden, while the left has resurged in Latin America. National elections will take place in several G20 countries within the next two years, including the United States of America, South Africa, Türkiye, Argentina, Mexico and Indonesia. The election of less-centrist leaders and adoption of more "extreme" policies in economic superpowers may fracture alliances, limit global collaboration and lead to a more volatile dynamic.

1.3 Looking ahead

The way risks play out over the next two years has ramifications for the decade to come. Nearly one in five respondents to the GRPS felt optimistic about the outlook for the world in the longer term, predicting limited volatility with relative – and potentially renewed – stability over the next 10 years (Figure 1.10). Yet, over half anticipated progressive tipping points and persistent crises leading to catastrophic outcomes over the next 10 years, or consistent volatility and divergent trajectories. Notably, younger age groups were more hopeful for the future: one in three respondents under the age of 40 shifted to a neutral or positive stance over the longer time frame.

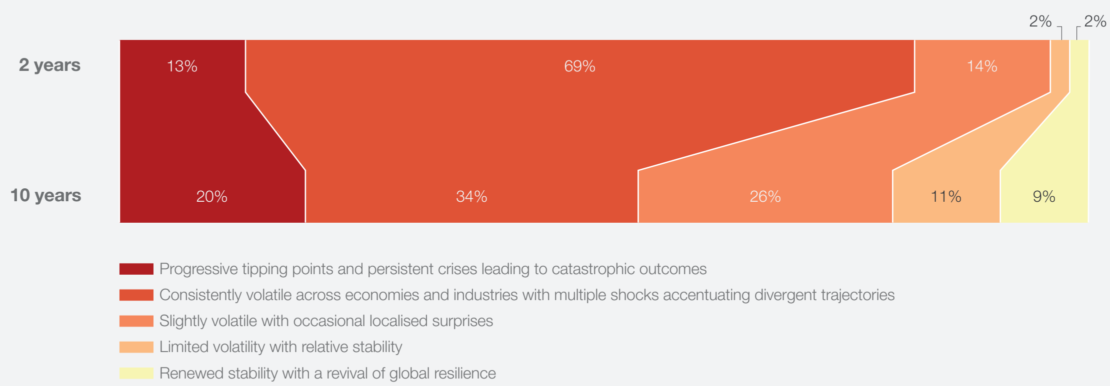
Shocks of recent years – most notably, the war in Ukraine and COVID-19 pandemic – have reflected and accelerated an epochal change to the global order. Risks that are more severe in the short term are embedding structural changes to the economic and geopolitical landscape that will accelerate other global threats faced over the next 10 years. And as the confluence of current crises distracts focus and resources from risks arising over the medium to longer-term horizon, we may face increasing burdens on natural and human ecosystems. Some of these risks are close to a tipping point, but there is a window to shaping a more secure future. Understanding them is vital.

The next chapter considers the potential global shocks we are heading towards over the next decade, highlighting worrying developments emerging from the crises of today that are eroding the resilience and stability of the global system. It highlights a series of such emergent risks – the shocks of tomorrow – that can be reduced through collective attention and action today.

FIGURE 1.10

Short- and long-term global outlook

"Which of the following best characterizes your outlook for the world over the short-term (2 years) and longer-term (10 years)?



Source

World Economic Forum, Global Risks Perception Survey 2022-2023.

Endnotes

1. Bogmans, Christian, Andrea Pescatori and Ervina Prifti, "Four Facts about Soaring Consumer Food Prices", *IMF Blog*, 24 June 2021, https://www.imf.org/en/Blogs/Articles/2021/06/24/four-facts-about-soaring-consumer-food-prices; Hoffer, Brice, "On the rise: Growth of the global rental housing sector", *UBS*, 2021, https://www.ubs.com/content/dam/assets/asset-management-reimagined/global/insights/asset-class-perspectives/real-estate/docs/white-paper-on-the-rise.pdf.

2. Georgieva, Kristalina, Gita Gopinath and Ceyla Pazarbasioglu, "Why We Must Resist Geoeconomic Fragmentation – and How", *IMF Blog*, 22 May 2022, https://www.imf.org/en/Blogs/Articles/2022/05/22/blog-why-we-must-resist-geoeconomic-fragmentation.

3. Federal Reserve Bank of New York, *Global Supply Chain Pressure Index*, https://www.newyorkfed.org/research/policy/gscpi#/interactive, accessed 27 October 2022.

4. Food and Agriculture Organisation of the United Nations (FAO), *FAOSTAT: Consumer Price Indices*, https://www.fao.org/faostat/en/#data/CP, accessed 27 October 2022.

5. Guénette, Justin-Damien and Jeetendra Khadan, 2022, "The energy shock could sap global growth for years", *World Bank blogs*, 22 June 2022.

6. Anstey, Chris, "What's Happening in the World Economy: Unforgiving Mortgage Rates", *Bloomberg.com*, 6 October 2022, https://www.bloomberg.com/news/newsletters/2022-10-06/what-s-happening-in-the-world-economy-unforgiving-mortgage-rates; Dickler, Jessica, "Another Interest Rate Hike from the Federal Reserve Is on the Way: Here's How It May Affect You", *CNBC*, 31 October 2022, https://www.cnbc.com/2022/10/31/another-fed-rate-hike-is-onthe-way-heres-how-it-could-impact-you.html.

7. Zhou, Xiaoqing and Jim Dolmas, "Rent inflation expected to accelerate then moderate in mid-2023", *Federal Reserve Bank of Dallas*, 16 August 2022.

8. Pearce, Graham, Kate Bravery, Adrienne Cernigoi, and Sumer Drall, "Risk and retirement: where are the future financial hotspots?", *Marsh McLennan*, September 2022, https://www.marshmclennan.com/insights/publications/2022/september/risk-and-retirement-where-are-the-future-financial-hotspots.html.

9. Credit Suisse Research Institute, *Global Wealth Report 2022: Leading perspectives to navigate the future*, 2022, https://www.credit-suisse.com/about-us/en/reports-research/global-wealth-report.html#:~:text=Global%20Wealth%20Report%202022&text=Total%20global%20wealth%20grew%20by,fastest%20annual%20rate%20ever%20recorded, accessed 14 November 2022; Federal Reserve Bank of New York, *Total Household Debt Surpasses $16 trillion in Q2 2022; Mortgage, Auto Loan and Credit Card Balances Increase*, 2 August 2022.

10. Gebreab, Efrem, Thomas Naadi, Ranga Sirilal and Becky Dale, "Fuel protests gripping more than 90 countries", *BBC*, 17 October 2022, https://www.bbc.com/news/world-63185186.

11. Food and Agriculture Organisation of the United Nations (FAO), *War in Ukraine intensifies food security risks in the Southern and Eastern Mediterranean*, 8 September 2022, https://www.fao.org/support-to-investment/news/detail/en/c/1603647/.

12. Haq, Mifrah, "Pakistan Faces Hunger Crisis as Floods Wash Away Crops, Livestock", *Nikkei Asia*, 13 September 2022, https://asia.nikkei.com/Economy/Natural-disasters/Pakistan-faces-hunger-crisis-as-floods-wash-away-crops-livestock.

13. Food and Agriculture Organisation of the United Nations (FAO), *Crop prospects and food situation, September 2022*, 14 November 2022, https://www.fao.org/3/cc2300en/cc2300en.pdf.

14. Hance, Jeremy, "Trouble in the tropics: The terrestrial insects of Brazil are in decline", *Mongabay*, 5 October 2022; Jepsen, Sarina, "California Supreme Court let decision stand that bees can be protected by the California Endangered Species Act", *Xerces Society for Invertebrate Conservation*, 22 September 2022.

15. Trading Economics, *Inflation Rate*, https://tradingeconomics.com/country-list/inflation-rate?continent=world, accessed 14 November 2022; Amaro, Silvia, "Euro zone inflation hits record high of 10.7% as growth slows sharply", *CNBC*, 31 October 2022.

16. IMF, *World Economic Outlook Report October 2022: Countering the cost-of-living crisis, October 2022*, 2022, https://www.imf.org/en/Publications/WEO/Issues/2022/10/11/world-economic-outlook-october-2022.

17. Bank of International Settlements, *Central bank policy rates*, https://www.bis.org/statistics/cbpol.htm?m=2679, accessed 27 October 2022.

18. IMF, *World Economic Outlook Report October 2022: Countering the cost-of-living crisis, October 2022*, 2022, https://www.imf.org/en/Publications/WEO/Issues/2022/10/11/world-economic-outlook-october-2022.

19. Echavarria, Paulina Restrepo and Praew Grittayaphong, "Dollar-denominated public debt in Asia and Latin America", *Federal Reserve Bank of St Louis*, 3 August 2021, https://www.stlouisfed.org/on-the-economy/2021/august/dollar-exposure-public-debt-asia-latin-america.

20. Beers, David, et. al, "BoC-BoE Sovereign Default Database: What's new in 2022", *Bank of Canada*, https://www.bankofcanada.ca/wp-content/uploads/2022/08/san2022-11.pdf, accessed 14 November 2022.

Endnotes

21. Wheatley, Jonathan, “Outflows from emerging market bond funds reach $70 billion in 2022”, *Financial Times*, 2 October 2022.

22. Chabert, Guillaume, Martin Cerisola and Dalia Hakura, "Restructuring debt of poorer nations requires more efficient coordination”, *IMF Blogs*, 7 April 2022.

23. Schnabel, Isabel, *Speech: A new age of energy inflation: climateflation, fossilflation, and greenflation*, 17 March 2022, speech presented at The ECB and its Watchers XXII Conference, Frankfurt, https://www.ecb.europa.eu/press/key/date/2022/html/ecb.sp220317_2~dbb3582f0a.en.html, accessed 14 November 2022.

24. Leggett, Theo, “Germany takes control of stakes in Rosneft oil refineries”, *BBC*, 16 September 2022, https://www.bbc.com/news/business-62924071.

25. Bryan, Kenza and Sarah White, “Total accused of being complicit in Russian war crimes in Ukraine”, *Financial Times*, 14 October 2022; Gretler, Connie, “Nestle defends its Russia stance saying food is a basic right amid war”, *Bloomberg*, 7 April 2022.

26. Bounds, Andy, “EU accuses US of breaking WTO rules with green energy incentives”, *Financial Times*, 6 November 2022.

27. Liu, Qianer, Kathrin Hille and Yuan Yang, “World’s top chip equipment suppliers halt business with China”, *Financial Times*, 13 October 2022.

28. Farge, Emma, “WTO can reach deals on 'difficult' topics by early 2024 - WTO chief”, *Reuters*, 27 September 2022; Gruszczynski, Lukasz and Margherita Melillo, “The Uneasy Coexistence of Expertise and Politics in the World Health Organization”, *International Organisations Law Review*, 24 March 2022.

29. Moonakal, Nadeem Ahmed, “The Impact and Implications of China’s Growing Influence in the Middle East”, *The Diplomat*, 9 July 2022.

30. 2021 data. World Meterological Organization, *Greenhouse Gas Bulletin*, 26 October 2022.

31. Davis, James and Robert Bailey, “Missing the Mark”, *Oliver Wyman & CDP*, 2022, https://www.oliverwyman.com/our-expertise/insights/2022/sep/cdp-temperature-ratings.html.

32. Mulder, Nicholas, *The Sanctions Weapon*, Finance & Development, June 2022; Papathanasiou, Demetrios, “Renewables are the key to green, secure, affordable energy”, *World Bank Blogs*, 21 June 2022, https://blogs.worldbank.org/energy/renewables-are-key-green-secure-affordable-energy.

33. Hancock, Alice, “Europe’s new dirty energy: the ‘unavoidable evil’ of wartime fossil fuels”, *Financial Times*, 6 September 2022.

34. UN Secretary General’s High-Level Expert Group on Net-Zero Emissions Commitments of Non-State Entities, *Integrity Matters*, 8 November 2022, https://www.un.org/en/climatechange/high-level-expert-group.

35. The Economist, *Germany faces a looming threat of deindustrialisation*, 11 September 2022, https://www.economist.com/business/2022/09/11/germany-faces-a-looming-threat-of-deindustrialisation?itm_source=parsely-api.

36. Silke, Andrew and John Morrison, “Gathering Storm: An Introduction to the Special Issue of Climate Change and Terrorism”, *Terrorism and Political Violence*, vol. 35, iss 5, 5 July 2022, pp. 883-893.

37. For more detail on the complex link between extreme weather events and anthropogenic causes, refer to World Meteorological Organization, *Atlas of Mortality and Economic Losses from Weather, Climate and Water Extremes (1970–2019)*, WMO-No. 1267, 2021.

38. Pörtner, Hans-Otto (ed.) et. al, *Climate Change 2022: Impacts, Adaptation and Vulnerability*, IPCC, 2022.

39. Bellon, Matthieu and Emmanuele Massetti, “Economic Principles for Integrating Adaptation to Climate Change into Fiscal Policy”, *IMF*, March 2022; Pörtner, Hans-Otto (ed.) et. al, *Climate Change 2022: Impacts, Adaptation and Vulnerability*, IPCC, 2022.

40. UN Environment Programme (UNEP), *Adaptation Gap Report 2022*, 1 November 2022.

41. Bevere, Lucia and Federica Remondi, *Sigma: Natural catastrophes in 2021: the floodgates are open*, Swiss Re Institute, 30 March 2022.

42. Ibid.

43. Formerly described as **“Profound social instability”** in the GRPS.

44. Ganesh, Janan, “Anarchy is a likelier future for the west than tyranny”, *Financial Times*, 21 June 2022.

45. Carnegie Endowment for International Peace, *Global Protest Tracker, 2022*, November 9, https://carnegieendowment.org/publications/interactive/protest-tracker.

Endnotes

46. V-Dem Institute, *Democracy Report 2022: Autocratization Changing Nature?*, University of Gothenburg, 2022, https://www.v-dem.net/documents/19/dr_2022_ipyOpLP.pdf; Somer, Murat and Jennifer L. McCoy, “Pernicious polarization, autocratization and opposition strategies”, *Democratization*, vol 28, 12 Jan 2021; McCoy, Jennifer and Benjamin Press, *What Happens When Democracies Become Perniciously Polarized?,* Carnegie Endowment for International Peace, 18 January 2022.

47. Buschschlüter, Vanessa, “Brazil election: Lula makes stunning comeback”, *BBC*, 31 October 2022.

48. Mano, Ana and Anthony Boadle, “Brazil's Bolsonaro Silent on Lula Victory, Transition Talks Begin”, *Reuters*, 1 November 2022, https://www.reuters.com/world/americas/lula-wins-brazilian-election-bolsonaro-has-not-conceded-2022-10-31/.

49. Lewandowsky, Stephan, et. al, “Is the global decline in democracy linked to social media? We combed through the evidence to find out”, *The Conversation*, 8 November 2022.

50. Favaro, Marina, Neil Renic and Ulrich Kühn, *Negative Multiplicity: Forecasting the Future Impact of Emerging Technologies on International Stability and Human Security*, Institute for Peace Research and Security Policy, September 2022.

51. Lai, Samantha, *Data misuse and disinformation: Technology and the 2022 elections*, Brookings Institute, 21 June 2022.

52. Lee, Amber Hye-Yon, “Social Trust in Polarized Times: How Perceptions of Political Polarization Affect Americans’ Trust in Each Other”, *Political Behaviour*, vol. 44, no. 3, 18 March 2022, pp. 1533-1544; Carothers, Thomas and Andrew O’Donohue, *How to Understand the Global Spread of Political Polarization*, Carnegie Endowment for International Peace, 1 October 2019.

53. Walter, Barbara, “Why should we worry that the US could become an 'anocracy' again? Because of the threat of civil war”, *The Washington Post*, 24 January 2022, https://www.washingtonpost.com/opinions/2022/01/24/why-should-we-worry-that-us-could-become-an-anocracy-again-because-threat-civil-war/.

2

Global Risks 2033: Tomorrow's Catastrophes

2.1 The world in 2033

As risks highlighted in the past chapter unfold today, much-needed attention and resources are being diverted from global risks that may become tomorrow's shocks and crises. The Global Risks Perceptions Survey (GRPS) addresses a one-, two- and 10-year horizon. Chapter one addressed the present and two-year time frame, focusing on currently unfolding and shorter-term risks. This chapter focuses on the third time frame: risks that may have the most severe impact over the next 10 years.

Based on GRPS results, the longer-term global risks landscape is also dominated by deteriorating environmental risks (Figure 2.1). More specifically, climate- and nature-related risks lead the top 10 risks, by severity, that are expected to manifest over the next decade. Differentiated as separate risks for the first time in the GRPS, **Failure to mitigate climate change** and **Failure of climate-change adaptation** top the rankings as the most severe risks on a global scale, followed by **Natural disasters and extreme weather events** and **"Biodiversity loss and ecosystem collapse"**.

FIGURE 2.1

Global risks ranked by severity over the long term (10 years)

1	Failure to mitigate climate change	6	Natural resource crises
2	Failure of climate-change adaptation	7	Erosion of social cohesion and societal polarization
3	Natural disasters and extreme weather events	8	Widespread cybercrime and cyber insecurity
4	Biodiversity loss and ecosystem collapse	9	Geoeconomic confrontation
5	Large-scale involuntary migration	10	Large-scale environmental damage incidents

Risk categories: Economic | Environmental | Geopolitical | Societal | Technological

Source

World Economic Forum Global Risks Perception Survey 2022-2023.

Comparing the two-year and 10-year time frames provides a picture of areas of increasing, decreasing and continued concerns according to GRPS respondents (Figure 2.2). The top right of the graph indicates global risks that are perceived to be the most severe in both the short and long term. These are consistent areas of global concern and, arguably, attention. Four environmental risks have worsening scores over the course of the 10-year time frame, indicating respondents' concerns about increased severity of these risks in the longer term. **"Large-scale involuntary migration**, rises to fifth place in the 10-year time frame, while **Erosion of social cohesion and societal polarization** is perceived to be slightly more severe over the longer term.

Risks that are growing in severity over the longer term include **"Biodiversity loss and ecosystem collapse"** and **"Misinformation and disinformation"**. Among other technological risks, as indicated in the far left of the graph, **"Digital inequality and lack of access to digital services"** and **"Adverse outcomes of frontier technologies"** are also anticipated to significantly deteriorate over the 10-year time frame.

The scores of multiple social risks are also worsening, including **"Severe mental health deterioration", "Collapse or lack of public infrastructure and services"**, and **"Chronic diseases and health conditions"**. In contrast, economic risks such as **"Failure to stabilize price trajectories", "A prolonged economic downturn", "Collapse of a systemically important industry or supply chain"**, and **"Asset bubble burst"** are perceived to fall slightly in expected severity over the 10-year time frame.

The far right of the graph indicates that today's most prominent risk, the **"Cost-of-living crisis"**, is anticipated to drop in severity over the longer term. Towards the center, the scores of geopolitical risks were mixed, with the **"Use of weapons of mass destruction"** remaining consistent, **"State collapse or severe instability"** and **"Ineffectiveness of multilateral institutions"** worsening and **Interstate conflict** perceived as decreasing in severity.

This year, we look at five newly emerging or rapidly accelerating risks clusters – drawn from the economic, environmental, societal, geopolitical and technological domains, respectively – that could become tomorrow's crisis. We explore their current drivers and emerging implications, and briefly touch on opportunities to forestall and reshape these outcomes by acting today.

FIGURE 2.2

Relative severity of risks over a 2 and 10-year period

Risk categories | Economic | Environmental | Geopolitical | Societal | Technological

Source

World Economic Forum Global Risks Perception Survey 2022-2023.

Note

Severity was assessed on a 1-7 Likert scale [1 – Low severity, 7 – High severity].

These include:

- *Natural ecosystems:* deteriorating risks to natural capital ("assets" such as water, forests and living organisms) due to growing trade-offs and feedback mechanisms relating to climate change, taking us past the point of no return.

- *Human health:* chronic risks that are being compounded by strained healthcare systems facing the social, economic and health aftereffects of the COVID-19 pandemic.

- *Human security:* a nascent reversal in demilitarization and growing vulnerability of nuclear-armed states to emerging technologies, emerging from new weapons and multi-domain conflicts.

- *Digital rights:* the potential evolution of data and cyber insecurity, given the slow-burning, insidious erosion of the digital autonomy of individuals, putting privacy in peril.

- *Economic stability:* growing debt crises, with repercussions for financial contagion as well as collapse of social services, emerging from a global reckoning on debt and leading to social distress.

The newly emerging or rapidly accelerating risk clusters identified this year are not intended to be exhaustive. Rather, they aim to provide topic-specific analysis, nudge pre-emptive action and attention, and serve as examples for applying similar analysis to a range of other future risk domains.

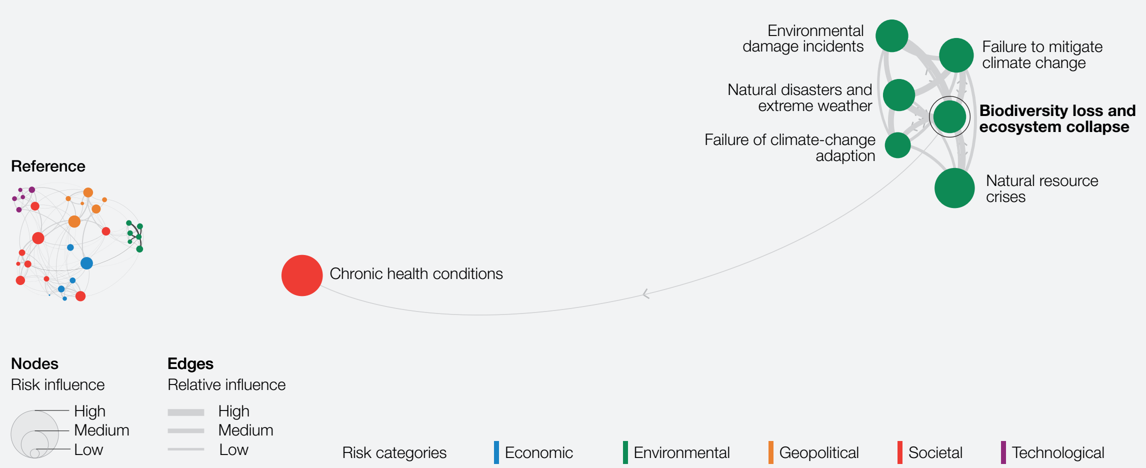
2.2 Natural ecosystems: past the point of no return

Biodiversity within and between ecosystems is already declining faster than at any other point during human history.[1] Unlike other environmental risks, **Biodiversity loss and ecosystem collapse** was not seen as pressing of a concern by GRPS respondents over the short term. Yet it accelerates in perceived severity, rising to 4th place over the 10-year time frame (Figure 2.1).

Human interventions have negatively impacted a complex and delicately balanced global natural ecosystem, triggering a chain of reactions. Over the next 10 years, the interplay between biodiversity loss, pollution, natural resource consumption, climate change and socioeconomic drivers will make for a dangerous mix (Figure 2.3). Given that over half of the world's economic output is estimated to be moderately to highly dependent on nature, the collapse of ecosystems will have far-reaching economic and societal consequences. These include increased occurrence of zoonotic diseases, a fall in crop yields and nutritional value, growing water stress exacerbating potentially violent conflict, loss of livelihoods dependent on food systems and nature-based services like pollination, and ever more dramatic floods, sea-level rises and erosion from the degradation of natural flood protection systems like water meadows and coastal mangroves.

FIGURE 2.3

Compounding environmental crises



Source

World Economic Forum, Global Risks Perception Survey 2022-2023.

Terrestrial and marine ecosystems are facing multiple pressure points due to their undervalued contribution to the global economy as well as overall planetary health. While not the sole drivers, at the heart of this potential catastrophe are key trade-offs and feedback mechanisms emerging from current crises. Without significant policy change or investments, the complex linkages between climate change mitigation, food insecurity and biodiversity degradation will accelerate ecosystem collapse.

Exponentially accelerating nature loss and climate change

Nature loss and climate change are intrinsically interlinked – a failure in one sphere will cascade into the other, and attaining net zero will require mitigatory measures for both levers.[2] If we are unable to limit warming to 1.5°C or even 2°C, the continued impact of natural disasters, temperature and precipitation changes will become the dominant cause of biodiversity loss, in terms of composition and function (Figure 2.4).[3] Heatwaves and droughts are already causing mass mortality events (a single hot day in 2014 killed more than 45,000 flying foxes in Australia), while sea level rises and heavy storms have caused the first extinctions of entire species.[4] Arctic sea-ice, warm-water coral reefs and terrestrial ecosystems have been found most at risk in the near term, followed by forest, kelp and seagrass ecosystems.[5]

The impacts of climate change on ecosystems can further constrain their mitigation effects. Increased severity and frequency of extreme weather events and other natural disasters are already degrading nature-based solutions to climate change, such as wildfires in forests used for carbon offsetting.[7] In addition, a variety of ecosystems are at risk of tipping over into self-perpetuating and irreversible change that will accelerate and compound the impacts of climate change. Continued damage to carbon sinks through deforestation and permafrost thaw, for example, and a decline in carbon storage productivity (soils and the ocean) may turn these ecosystems into "natural" sources of carbon and methane emissions.[8] The impending collapse of the Greenland and West Antarctic ice sheets may contribute to sea-level rise and coastal flooding, while the "die-off" of low-latitude coral reefs, the nurseries of marine life, are sure to impact food supplies and broader marine ecosystems.

Trade-offs between food security and nature conservation

Land-use change remains the most prolific threat to nature, according to many experts.[9] Agriculture and animal farming alone take up more than 35% of Earth's terrestrial surface and are the biggest direct drivers of wildlife decline globally. The ongoing crisis in the affordability and availability of food supplies positions efforts to conserve and restore terrestrial biodiversity at odds with domestic food security, as explored in Chapter 3: Resource Rivalries.

Conservation efforts and nature-based solutions (which can offer biodiversity co-benefits) will struggle to be commercially competitive with intensive, yield-focused agricultural practices, particularly in

FIGURE 2.4

Impacts of climate change on ecosystems

Confidence in attribution to climate change

	Changes in ecosystem structure			Species range shifts			Changes in timing (phenology)		
Ecosystems	Terrestrial	Freshwater	Ocean	Terrestrial	Freshwater	Ocean	Terrestrial	Freshwater	Ocean
Global	High	High	High	High	High	High	High	High	High
Africa	High	High	High	High	Lim. evidence	High	Lim. evidence	Low	Low
Asia	High	Medium	High	Low	Medium	Lim. evidence	Low	Low	Medium
Australasia	High	High	High	High	Lim. evidence	High	High	Lim. evidence	Low
Central and South America	High	High	High	High	High	High	Lim. evidence	Lim. evidence	Low
Europe	High	High	High	High	High	High	High	High	High
North America	High	High	High	High	High	High	High	High	High
Small Islands	High	High	High	High	High	High	High	Lim. evidence	Medium
Arctic	High	Medium	High	High	High	High	High	Medium	High
Antarctic	Medium	Lim. evidence	Medium	Medium	Lim. evidence	Medium	Medium	Lim. evidence	Lim. evidence
Mediterrean region	High	Lim. evidence	High	High	Medium	High	High	Lim. evidence	Medium
Tropical forest	High	Lim. evidence	N/A	Medium	Lim. evidence	N/A	Lim. evidence	Lim. evidence	N/A
Mountain regions	High	High	N/A	High	Medium	N/A	High	Low	N/A
Deserts	High	N/A	N/A	High	N/A	N/A	Lim. evidence	N/A	N/A
Biodiversity hotspots	High	Lim. evidence	High	High	Lim. evidence	High	High	Lim. evidence	Not assessed

Source

IPCC, 2022.[6]

densely populated, agrarian nations. State incentives to boost local production and reduce reliance on imports – in a reaction to current geopolitical and supply pressures – could come at the cost of ecosystem preservation. Technology will provide partial solutions in the countries that can afford it. For example, the global vertical farming market has been predicted to grow at a compound annual rate of 26% and hit $34 billion by 2033.[10] These agricultural production techniques increase food output per unit area with a smaller water and biodiversity footprint, but can actually be more carbon-intensive and may have an indirect land footprint that exceeds open-field farming in some regions.[11]

Given a highly uncertain economic outlook, developing and emerging markets may struggle to close the funding gap to increase agricultural productivity. Pressure on biodiversity will likely be further amplified by continued deforestation for agricultural processes, with an associated demand for additional cleared cropland,[12] especially in subtropical and tropical areas with dense biodiversity such as Sub-Saharan Africa and Southeast Asia.[13] Biodiversity and ecosystem preservation could be supported through the expanded use of concessional financing and debt restructuring: 58 developing countries exposed to climate change have almost $500 billion in collective debt reservicing payments due in the next four years.[14] Increased deployment of debt-for-nature swaps, for example, could be targeted towards conservation and restoration. In fact, this type of restructuring is being pursued by Ecuador, Sri Lanka and Cape Verde.[15] However, these mechanisms could contribute to shorter term challenges of food insecurity, rising cost of living and declining government revenue.[16] In addition, indigenous communities can be disproportionately at risk from these activities. "Fortress conservation" can encroach on indigenous land tenure and has previously been linked to forced evictions, even fatalities.[17]

Yet, there is a more existential feedback mechanism to consider: biodiversity contributes to the health and resilience of soil, plants and animals, and its decline puts both food production yields and nutritional value at risk.[18] This could then fuel deforestation, increase food prices, threaten local livelihoods and contribute to diet-related diseases and mortality (explored in **Chapter 2.3: Human health**). It may also lead to **Large-scale involuntary migration**, a new entrant in the Top 10 rankings in the GRPS survey (Figure 2.1) and analysed in last year's Global Risks Report chapter 'Barriers to Migration'.

New battlefronts between ecosystems and "green" energy sources

The transition to clean energy is critical for the mitigation of climate change by reducing the carbon footprint of energy compared to fossil fuels. Yet the rapid expansion of green infrastructure in a quest for energy security may have unintended impacts on domestic and broader ecosystems, as the dependencies on and risks to natural ecosystems of these technologies are, presently, less well understood. Although renewable energy infrastructure can be "nature-positive" – for example, wind farms acting as a "safe haven" for the recovery of marine populations and the seabed – green sources of energy can also cause environmental degradation, such as habitat loss, sound and electromagnetic pollution, introduction of non-indigenous species and changes to animal migratory patterns.[19]

Renewable energy technologies are also reliant on non-renewable, abiotic natural capital (metals and minerals, as explored in **Chapter 3: Resource Rivalries**). These are sourced from the geosphere, which, together with the hydrosphere, provide the physical habitat for the global ecosystem. These resources are often concentrated in countries with poor governance of nascent, artisanal and illicit mining, or less stringent environmental and social regulations – increasing the likelihood of more widespread destruction of nature and devastation of local communities and indigenous groups. Mining of rare earth elements in Myanmar and the Democratic Republic of the Congo have already caused widespread deforestation, habitat destruction of endangered species and water pollution, and have been linked to human rights abuses and financing of militia groups.[20] While offering the possibility of socioeconomic development and diversification, the expansion of green metals mining in nature-rich or ecologically sensitive areas, such as the Plurinational State of Bolivia and Greenland, has the potential to destabilize water tables and disrupt ecosystems.[21] The pressure to push ahead with deep-sea mining also entails significant risks, due to the unknown impacts to critical oceanic ecosystems.[22]

It is clear that both the scale and pace needed to transition to a green economy require new technologies. However, some of these technologies risk impacting natural ecosystems in new ways, with limited opportunity to “field-test” results. The urgency of climate change mitigation is incentivizing the deployment of new technologies, potentially with less stringent testing and protocols. Carbon removal technologies will be particularly essential to achieve a net zero world if anthropogenic emissions do not sufficiently decline, or emissions from natural resources continue to increase. Gene editing to enhance natural carbon capture productivity, geoengineering for carbon removal,[23] and solar radiation management all pose major future risks – from enhanced water stress, nutrient “robbing” and redistribution of diseases to termination shock and the weaponization of stratospheric aerosol technologies.[24] Unintended consequences relating to technological “edits” to the atmosphere, biosphere, hydrosphere and geosphere can occur at speed, raising the risk of accidental extinction events.

Acting today

Averting tipping points requires a combination of conservation efforts, interventions to transform the food system, accelerated and nature-positive climate mitigation strategies, and changes to consumption and production patterns. This involves realigning incentives and upgrading governance structures, fueled by better data and tools to capture the interdependencies of food, climate, energy and ecosystems.

There are already initial signs of shifts in this direction. The increasing visibility and influence of multilateral and market-led initiatives such as the Taskforce for Nature-related Financial Disclosures (TFND) set to launch later this year, are positive developments. The 15th Conference of Parties to the Convention of Biological Diversity (CBD COP15) resulted in the Montreal-Kunming agreement, setting out new global targets for 2030 such as reforming environmentally damaging subsidy systems and restoring 30% of the planet’s degraded ecosystems. These significant steps confirm that the global community recognizes that the risks associated with nature loss, food production, energy generation and climate change cannot be fully mitigated in isolation. However, the translation into public- and private-sector action remains to be seen, particularly given limited progress on previous biodiversity – and climate – targets to date.

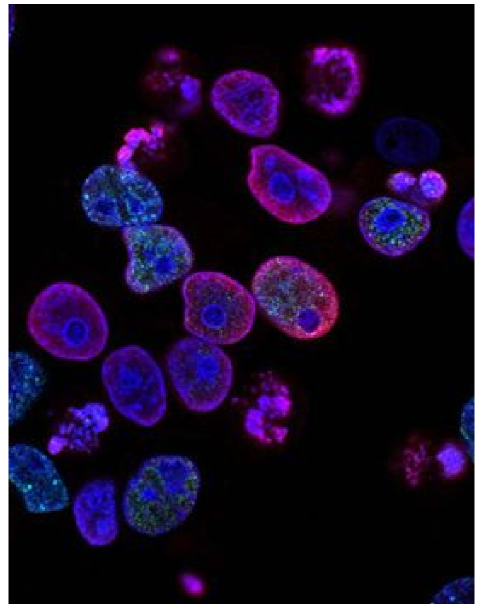
Although the relationship between climate and nature heightens the likelihood of a series of escalating and potentially irreversible feedback loops, it can equally be leveraged to broaden the impact of risk mitigation activities. Given increasing financial and capacity trade-offs, investment in resilience must focus on solutions that build preparedness for multiple risks. By restoring biodiversity in soils, for example, regenerative agriculture has the potential to store large amounts of carbon.

A focus on biodiversity preservation should drive and prioritize local adaptation and community resilience – and in doing so, contribute to the mitigation of climate change globally. Altered land management practices like afforestation, micro-irrigation and agroforestry are a low-cost way to increase resilience to extreme weather. The protection and restoration of marine biodiversity, such as mangrove systems, can enhance rather than compete with domestic food web productivity and security. It can also support local industries and livelihoods and provide protection from extreme weather. Such activities also produce co-benefits at a global level, such as enhancing carbon sequestration and climate regulation, offering potential revenue streams for developing nations in the form of carbon credits. Similarly, scaling up practices such as biocultural preservation, indigenous community management and integration of traditional knowledge into food production and cultivation can provide dual socioeconomic and environmental benefits.[25]

2.3 Human health: perma-pandemics and chronic capacity challenges

Global public health is under growing pressure and health systems around the world are at risk of becoming unfit for purpose. The COVID-19 pandemic further amplified ever-present spectres and emerging risks to physical and mental health, including antimicrobial resistance (AMR), vaccine hesitancy and climate-driven nutritional and infectious diseases (described in *'False Positive: Health Systems under New Pressures'* in our 2020 edition, published before the pandemic took hold). Given current crises, mental health may also be exacerbated by increasing stressors such as violence, poverty and loneliness.

There is also a rising risk of a "panic-neglect" cycle. As COVID-19 recedes from the headlines, complacency appears to be setting in on preparing for future pandemics and other global health threats. Healthcare systems face worker burnout and continued shortages at a time when fiscal consolidation risks deflecting attention and resources elsewhere. More frequent and widespread infectious disease outbreaks amidst a background of chronic diseases over the next decade risks pushing exhausted healthcare systems to the brink of failure around the world.[26]



Pandemic aftershocks meet silent health crises

Global health outcomes have been weakened by the COVID-19 pandemic, with lingering effects. Early evidence points to a post-COVID-19 condition impacting the quality of life and occupational status of individuals – contributing to work absences and early retirements, tighter labour markets and a decline in economic productivity. The resulting economic hit is estimated to be from roughly $140-600 billion to up to $3.7 trillion in the United States of America, and close to AUD$5 billion per year in Australia if current costs persist, reflecting loss of quality of life, lost earnings and output, and higher spending on medical care.[27] The pandemic also diverted resources from other diseases such as cancer screening and tuberculosis,[28] and immunization campaigns were put on hold. Vaccination rates for polio fell to the lowest level in 14 years, perhaps ushering in the return of the wild strain to Africa in 2021.[29]

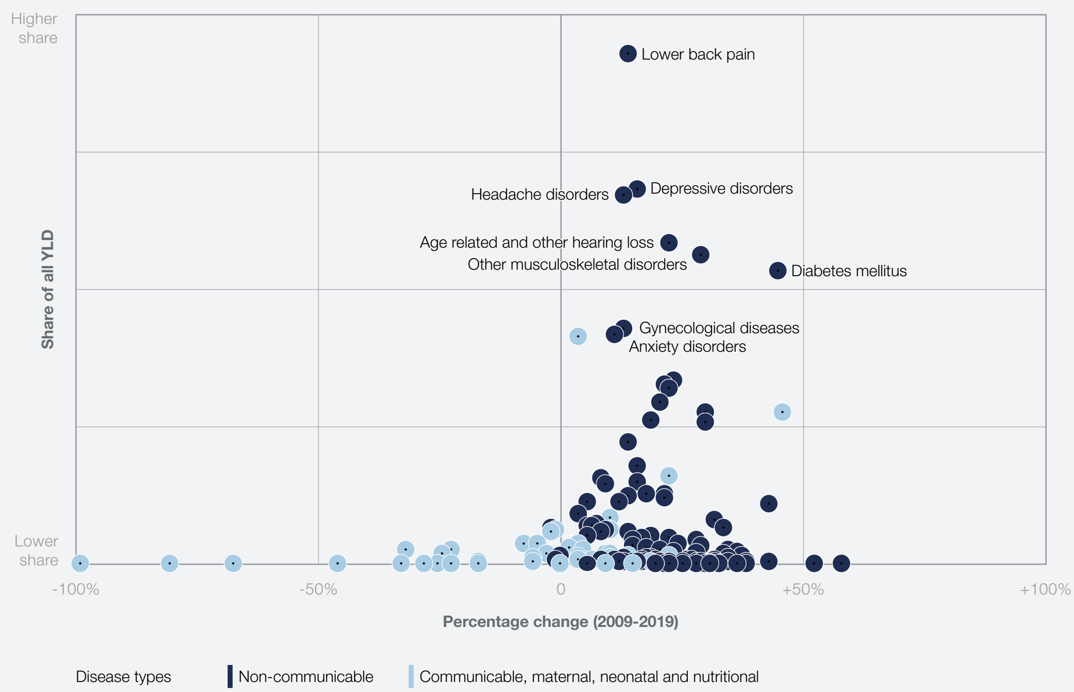
Beyond the lingering impact of COVID-19, the potential stresses imposed by climate change and nature loss on health are likely to grow, ranging from air pollution and heightened exposure to wet heatwave days (which increase heat stress on humans), to disrupted access to safe water and sanitation and increases in waterborne diseases due to floods. Urbanization, land use change and nature loss are heightening the emergence and re-emergence of diseases, including invasive fungal diseases, while global warming is increasing the number of months suitable for transmission of existing diseases such as malaria and dengue fever.[30] Climate change is also expected to exacerbate malnutrition as food insecurity grows. Increased levels of carbon dioxide in the atmosphere can result in nutrient deficiencies in plants, and even accelerated uptake of heavy minerals, which have been linked to cancer, diabetes, heart disease and impaired growth.[31]

Expanding sources of disease will combine with persistent disease burdens to entrench a growing health burden in developing and advanced economies alike. There has been a noticeable shift towards non-communicable diseases over the past decade (Figure 2.5), linked to population growth and ageing alongside lagging coverage by health systems. A key implication is the resulting loss of functional health and rise in disabilities, rather than deaths. Medical advances have made it possible for people to live with multiple co-morbidities (such as diabetes, hypertension, heart disease and depression), but these remain complex and expensive to manage. People are living more years in poor health, and we may soon face a more sustained reversal in life expectancy gains beyond the influence of the pandemic.

Notably, although some disease burdens are growing, all health-related risks fell into roughly the bottom third of the GRPS' global risk rankings over both the two- and 10-year period (Figure 2.2). **"Infectious diseases"** plummeted in risk

FIGURE 2.5

Loss of functional health



Source

IHME, 2020.[32]

Note

Annual percentage change to years lived with disability (YLD) from 2009 to 2019.

perceptions, from the sixth-most severe risk on a global scale over the next 10 years in last year's Global Risks Report, to 27th place this year. Further, female respondents to the GRPS consistently assessed health-related risks as more severe than their male counterparts. **Chronic diseases and health conditions** and **Severe mental health deterioration** were ranked 13th and 14th by female respondents, with the related **Collapse or lack of public infrastructure and services** in 19th place, compared to rankings of 23rd, 28th and 27th, respectively, by male respondents.

The decline in risk perception is likely driven by pandemic fatigue and the human tendency to focus on fresh, recent and more visible crises. Yet "silent" crises with cumulative impacts can quickly outpace a one-off, catastrophic event. The COVID-19 pandemic has been linked to nearly 6.6 million deaths globally at the time of writing noting that this figure will likely increase with China's lifting of stringent COVID-19 restrictions after three years.[33] In comparison, an estimated 4.95 million deaths were associated with drug-resistant bacteria (AMR) in 2019 alone, with roughly 1.27 million of these considered directly attributable to AMR.[34] Air pollution was estimated to be responsible for a further 9 million deaths in the same year, corresponding to one in six deaths worldwide.[35] While there are limitations to the collection and analysis of data in all three cases, and COVID-19's outcomes may have been far worse in the absence of rapid action, the comparisons highlight the potential of silent crises to create compounding, runaway damage.

Chronic capacity challenges

As disease burden grows and innovation widens the scope of what medicine can treat, inexorable demand for healthcare is running up against chronic capacity challenges. The COVID-19 pandemic disrupted the delivery of prevention and treatment services, resulting in a backlog for hospital and community care that may prove challenging to clear. More than 7 million people in the United Kingdom of Great Britain (more than one-tenth of the population) were waiting for non-emergency medical care in September 2022, while 10% of job posts remained vacant as the National Health Service struggled to retain staff.[36]

Health systems are likely to face intensifying financial pressure – with budget cuts or revenue loss as well as higher costs of goods and labour – as inflation persists, economies grow slowly or stagnate, and governments reprioritize expenditure to address more salient social and security concerns. Even before the COVID-19 pandemic aggravated staff shortages, the World Health Organization (WHO) predicted a global shortfall of 15 million health workers by 2030.[37] Some health systems are seeing productivity decline as experienced employees leave due to exhaustion, burnout and concerns about staff and patient safety. Skills and infrastructure gaps undermine capacity further as staff become overwhelmed by challenges for which they are not adequately equipped or supported to solve, leading to more strikes over pay and staffing levels.

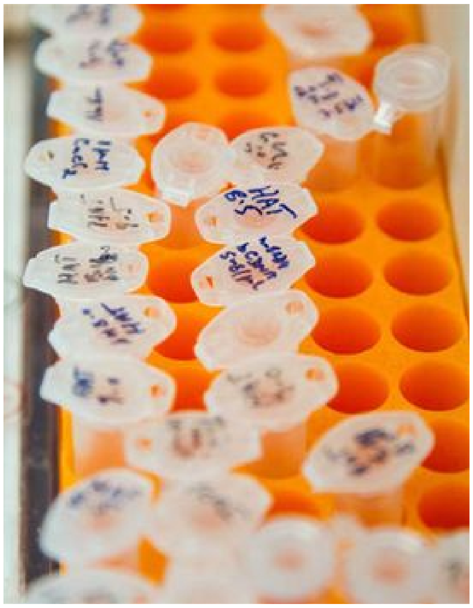
Medical inflation is expected to continue to outstrip GDP growth in many countries,[38] and financial pressures on working populations will intensify as dependency ratios rise. The United States of America already spends nearly 20% of its GDP on healthcare, even before its largest population cohort (the "Baby Boomers") has retired.[39] Governments, insurers or employers may respond by limiting coverage and shifting a greater proportion of the costs to individuals, reducing access and affordability of healthcare. Two-tier health systems, already prevalent in many advanced and developing economies, may become further entrenched, with a profitable private sector catering to patients with greater ability and willingness to pay, while poorer people remain reliant on increasingly threadbare public provision.[40]

A persistent mismatch between demand and supply gradually weakens the ability of health systems even in richer countries to cope and adapt, eroding care quality and shrinking healthcare access. Fragile health systems could quickly become overwhelmed by one or more catastrophic events. A large-scale cyberattack, war, extreme weather event or new or re-emergent infectious diseases could trigger health system collapse within one or more regions, resulting in a sudden surge of deaths from all causes. More gradual deterioration of health systems would also weaken overall health, widen health disparities, slow economic activity and undermine political and societal stability as a safety net disintegrates.

Socioeconomic syndemics

Combined with fragile health systems, there is a risk of a rise in "syndemics": a set of concurrent, mutually enhancing health problems that impact the overall health status of a population, within the context of political, structural or social environments.[41] The concept has long been applied to HIV research. More recently, it has been considered in the context of the COVID-19 pandemic and chronic disease burdens, which have resulted in higher morbidity and mortality rates among socially disadvantaged communities.[42] A similar pattern could now play out at a systemic level: deteriorating social, economic and political contexts will contribute to endemic diseases and lead to poorer health outcomes for select communities.

Inequality and conflicts in societal values could precipitate regulatory changes regarding education, employment, housing, gender, immigration and the



environment, some of which could have unintended compounding effects on specific diseases. For example, a lack of LGBTQ protection has been linked to poorer health outcomes relating to HIV, due to the resulting avoidance of healthcare.[43] Current crises might further derail health outcomes and equity. Chronic financial stress and rationing of essentials – such as having to choose between heating and eating – will have long-term physical and psychological impacts even on healthy people.[44] Lower confidence in public institutions has already resulted in less effective pandemic responses, and growing misinformation and disinformation could further increase vaccine hesitancy, which has already led to the re-emergence of locally-eradicated diseases such as polio.[45] These patterns may be reinforced as there is a clear rise in the erosion of social cohesion (see **Chapter 1.2: Societal polarisation**).

Geopolitical tensions could limit the co-development and sharing of new scientific breakthroughs, limiting respective abilities to address ever-present risks such as AMR as well as new ones. Export restrictions applied to medicine and medical products could cause a humanitarian crisis and spiral into controls over even more existential resources – most notably food – with compounding effects on health. Disparities in healthcare access may also worsen across and within countries as a result of economic inequality. For example, while advances such as in personalized, genomic and proteomic medicine can vastly improve health outcomes for chronic and degenerative conditions, they come with hefty price tags that may constrain widespread use; gene therapies can cost upwards of $2 million.[46] A rise in state instability and conflict would further limit the delivery of aid, disrupt vaccination programmes and put health workers at risk. This was evident in the case of polio vaccination workers killed in Afghanistan last year.[47]

Acting today

It is essential that we embed hard-earned lessons in preparedness for the next iteration of health crises. A continued focus on public health policy and interventions can have outsized impacts at national and regional levels, as a great deal of chronic disease burden is, in fact, preventable.[48] Realizing public health gains will require governments and business to promote the conditions that underpin wellbeing and encourage healthy lifestyles, such as good food, clean air, secure housing and social cohesion.

Public health agencies, healthcare providers and funders can play a key role by improving interactions and coordination between different parts of the health system to share information, expand capacity and improve overall population health. Planning for the long run will help governments better assess and manage health system risks, as will aligning policies that directly or indirectly affect health (such as agricultural policies that drive antibiotic use and increase AMR risk). Governments and businesses will also need to add a health dimension to crisis preparedness plans to withstand emerging risks.

In parallel, national and global health institutions and systems need to be strengthened in the face of multiple challenges. Innovation in care delivery, staffing and funding models are required for health systems to provide disease prevention, early detection and complex care cost-effectively for an increasingly frail and chronically ill population. There is also potential for healthcare to reap the advantages of technological advances and digital transformation that other sectors have embraced, such as augmenting capacity with technology and combining virtual and in-person care to reduce costs.

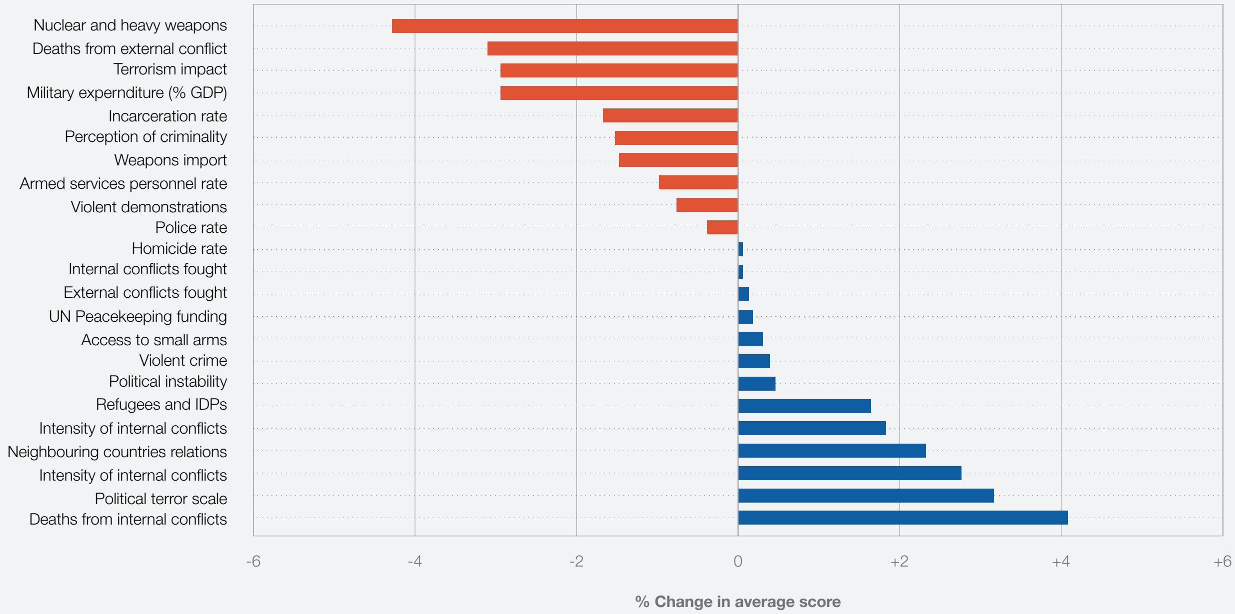
Opportunities to strengthen public health exist across countries, too, especially in the areas of pandemic surveillance and preparedness, scientific collaboration, and in mitigating global threat drivers such as climate change and AMR. It is essential that health nationalism is avoided in the face of the geopolitical and security considerations already underway today. Continued collaboration and information flows in the field of healthcare, pharmaceuticals and life sciences underpin efforts to ensure that our understanding and capability can continue to effectively address emerging health risks.

2.4 Human security: new weapons, new conflicts

GRPS results suggest that economic and information warfare will continue to pose a more severe threat than hot conflict over the next decade. **Interstate conflict** and **Use of weapons of mass destruction** were ranked lower in anticipated severity compared to **"Geoeconomic confrontation"** and **Misinformation and disinformation** over the 10-year time frame (Figure 2.2).

Past decades were defined by the non-deployment of humanity's most powerful weapons and no direct clashes between global powers. Prior to 2022, militarization had fallen in all regions, with recent data showing an overall decline in nearly 70% of the countries covered by the Global Peace Index 2022 over the past 15 years.[49] Even between 2021 and 2022, the holdings of nuclear and heavy weapons, military expenditure, weapons imports and armed services personnel rates declined (Figure 2.6). Yet the world still became less peaceful, with more violent demonstrations, external conflict and intense internal conflicts during the same fifteen-year period.[50]

FIGURE 2.6 **Pre-2022 trends in militarization and conflict**



Source

IEP, 2022.

Note

Percentage change in global score by indicator, 2021-2022.

A reversal of the trend towards demilitarization will heighten the risk of conflict, on a potentially more destructive scale. Growing mistrust and suspicion between global and regional powers has already led to the reprioritization of military expenditure and stagnation of non-proliferation mechanisms. The diffusion of economic, technological and, therefore, military power to multiple countries and actors is driving the latest iteration of a global arms race. Unlike previous power dynamics that were shaped by weapons of deterrence, the next decade could be defined by devastation from precision attacks and expanded conflicts.

New military architects and architecture

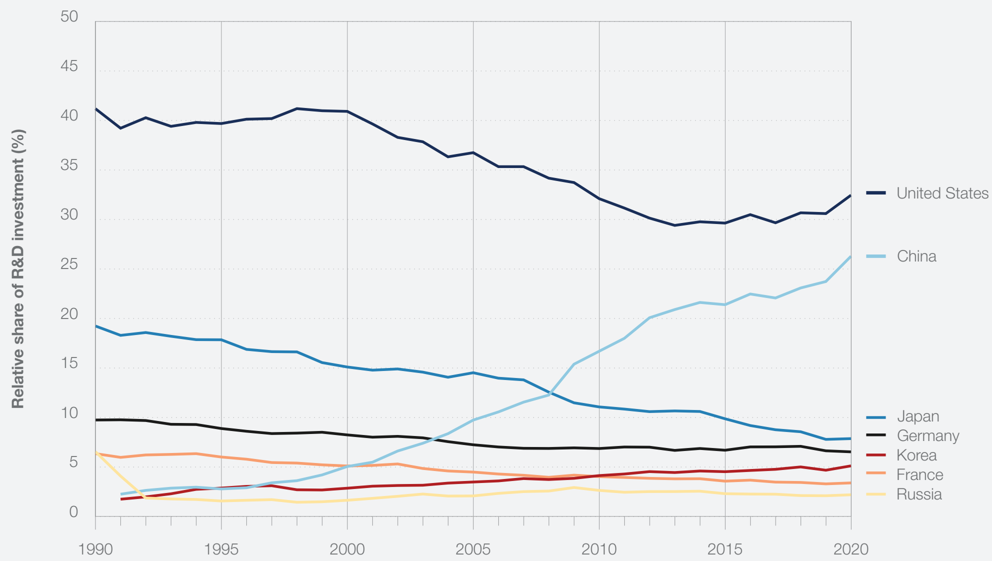
The 2010s saw global military expenditure growing in line with GDP and government budgets (5% of expenditure, down from 12% in the early 1990s).[51] However, today, global military expenditure as proportion of GDP is rising, driven predominantly by higher spending by the United States of America, the Islamic Republic of Iran, Russia, India, China and Saudi Arabia. Japan announced a proposal to double its defence budget to $105 billion (2% of its GDP) in May last year, and Qatar has increased spending by 434% since 2010 in response to blockades.[52] The war in Ukraine – as well as lukewarm condemnation by a few key geopolitical players – has driven recent pledges by NATO members to meet or exceed the target of 2% of GDP, which, if met by all members, would represent an increase in total budget by 7% in real terms.[53] Widespread defence spending, particularly on research and development, could deepen insecurity and promote a race between global and regional powers towards more advanced weaponry.[54]

The private sector is set to increasingly drive the development of military technologies, yielding advancements in semiconductor manufacturing, AI, quantum computing, biotechnology and even nuclear fusion, among other technologies.[55] Many of these are general purpose in nature with civilian applications, but are also a force multiplier of military power, enhancing the capabilities of autonomous weapons, cyberwarfare and defensive capabilities. Emerging technologies will be increasingly subject to state-imposed limits to cross-border flows of talent, IP, data and underlying technologies (such as extreme ultraviolet lithography equipment) and resources (such as critical metals and minerals), to constrain the comparative rise of foreign rivals. Enhanced focus and investment will drive innovations – global research and development expenditure hit 2.63% in 2021, the highest in decades.[56] There are sure to be multiple architects (Figure 2.7), with parallel innovations and interoperable ecosystems that will not only undermine efficiencies and duplicate efforts – even prior to the tightening of market conditions, technological fragmentation was estimated to result in losses of up to 5% GDP for many economies[57] – but may also increase risk.

Military-driven innovations in relevant fields will

FIGURE 2.7

Diffuse research and development



Source

Congressional Research Service, 2022.[58]

Note

Share of Global R&D of selected economies, 2000-2020. Global R&D includes the expenditures of the OECD countries, Argentina, China, Romaina, Russia, Singapore, South Africa and Taiwan, China. Share computed in Purchasing Power Parity terms.

have knock-on benefits for economic productivity and societal resilience, including personalized and preventative medicine, climate modelling and material science development. The influence of blocs will grow, closely tying together alliances across security, investment, trade, innovation, talent and standards. For example, Australia, Japan, South Korea and New Zealand were recently invited to participate at a NATO summit for the first time.[59] As developing economies seek to enhance their security in the new military architecture, they will be pulled deeper into the wider economic and military expansion of larger powers.[60] However, the Global South also risks being priced out of security and broader technological advancements. For example, the diffusion of dual-use technologies may be constrained or subject to high royalties, widening global inequality.

Next-generation technologies and multi-domain conflicts

New technologies will change the nature of the threat to national and international security, with a rise in multi-domain conflicts that blur the definition of conventional warfare. "Future battlefields" and methods of confrontation are expanding, encompassing the land, sea, air, cyberspace and outer space (explored in the Crowding and Competition in Space Chapter in last year's Global Risks Report).[61] Anti-satellite and hypersonic weapon capabilities have already been demonstrated by some states.[62] Directed Energy Weapons are expected to make significant progress over the next decade, with the potential to disable satellites, electronics, communications and positioning systems, and some of these weapons may be more cost-effective than traditional munitions.[63] Quantum computing may be harnessed to identify new materials for use in stealth technologies, and cyber and information warfare will be deployed to target vulnerabilities in increasingly sophisticated military technologies, which could range from disinformation campaigns to hacking hardware in nuclear defence systems.[64]

Importantly, these technologies are emerging in parallel – with the potential for simultaneous and compounding impacts on global security.[65] The testing and demonstration of enhanced capabilities could destabilize geopolitical relationships and accelerate an arms race, even in the absence of triggering conventional or nuclear strikes. This race will also slow the development of and adherence to norms, standards and safety protocols governing the development and use of these technologies, leaving fundamental questions unanswered – such as how to pursue fields like quantum computing, without simultaneously destabilizing the world's encryption systems and accelerating a global arms race.[66] As a result, self-regulation by the private sector will likely rise, as will consumer campaigning against military applications of technologies, such as the "Stop Killer Robots" coalition.

While social and global norms constraining the use of nuclear weaponry remain high, the unconstrained pursuit of lower-yield weaponry and stronger defensive military technologies could undermine the perceived security provided by nuclear weapons, putting in jeopardy a delicate strategic balance. Emerging technologies heighten the actual or perceived vulnerability of countries to attack, including nuclear-armed ones.[67] Advanced sensing technologies, particularly once enabled by quantum computing, could theoretically expose second-strike capabilities (mobile nuclear weapons) to real-time targeting and elimination.[68] The potential for lower-yield, more targeted nuclear weaponry has already brought into question the viability of the current threshold of activation for the "nuclear umbrella" of the United States of America. An escalating arms race may cause countries to roll back the no-first-use principle to enhance deterrence.

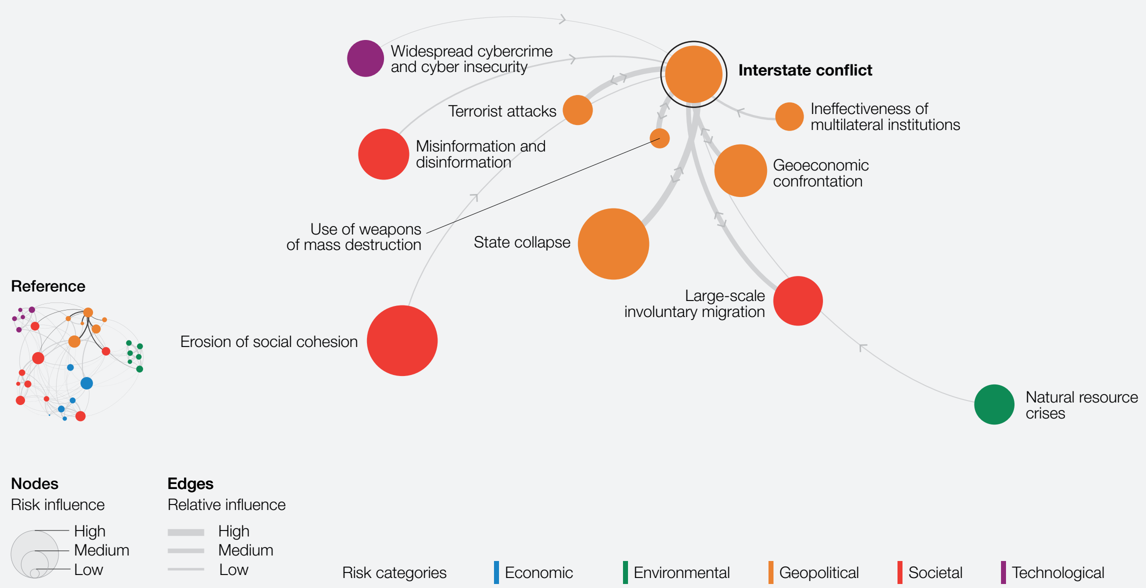
Together, these new technologies are escalating rhetoric and the pressure on existing governance mechanisms. This could lead to an increase in the global inventory of nuclear warheads for the first time since the Cold War,[69] raising the risk of accidental, miscalculated or deliberate clashes, with devastating results. Nuclear-armed countries continue to modernize arsenals and develop new types of delivery systems; late last year, the United States of America unveiled its first new nuclear-capable strategic bomber in more than three decades. The Treaty on the Prohibition of Nuclear Weapons, which entered into force in early 2021, continues to be opposed by all nine declared nuclear-armed states.[70] North Korea conducted the largest number of annual ballistic missiles launches last year, and there is escalating rhetoric in the context of the war in Ukraine.[71] The possibility of nuclear-sharing arrangements or even potential acquisition in limited circumstances has been raised in some non-nuclear states, such as Japan and the South Korea.[72] Negotiations on the revival of the Joint Comprehensive Plan of Action (JCPOA) have also stalled.[73] Although both the United States of America and Russia have continued to adhere to the New START Treaty, and disarmament technically continues, the usable military stockpiles of both countries - accounting for 90% of all nuclear weapons - remained stable in 2021.[74]

A rise in rogue actors

Proliferation of more destructive and new-tech military weaponry may enable newer forms of asymmetric warfare, allowing smaller powers and individuals to have a greater impact at a national and global level. Financial, information and intelligence thresholds are lower in many dual-use technologies. For example, advances in biotechnologies could enable the creation of pathogens by small groups or even individuals.[75] Low-cost drones utilizing swarm intelligence can be used to attack high-value units, including bases and fuel tanks.[76] The most recent available data suggests a consolidation of arms exports, with North America and Europe accounting for 87% of all arms exports from 2017-2021, alongside an accompanying decline from China and

FIGURE 2.8

Key drivers of interstate conflict



Source

World Economic Forum, Global Risks Perception Survey 2022-2023.

Russia.[77] However, any future diffusion of market share will increase the likelihood of advanced military systems being shared with more adversaries, across a broader geographic area.[78]

The lower cost and potential spread of conventional or chemical, biological, or nuclear weaponry to rogue actors will further erode the government's "monopoly on violence". This can increase the vulnerability of states and fuel migration, corruption and violence that can spill over borders.[79] Drones have already been used by non-state actors in Syria, Libya and Yemen, and both military and civilian drones have been used by formal security forces, paramilitary groups and non-combatants in Ukraine.[80] Despite limited transparency and accountability, there has also been a growing reliance on private militia and security services to protect assets and infrastructure, including vessels, commercial shipping, offshore platforms and ports. The use of these proxy, hybrid and private armies in multiple security contexts has been linked to violations of human rights and international law in conflict, post-conflict and peacetime settings.[81]

The distinction between civilian and military spheres is blurring further: these technologies expose populations to direct domestic threats, often with the objective of shattering societal functioning. This includes the physical and virtual disruption of critical resources and services at both a local and national level, such as agriculture and water, financial systems, public security, transport, energy, and domestic, space-based and undersea communication infrastructure. **"Breakdown of critical information infrastructure"** was ranked tied 16th by GRPS respondents in terms of perceived severity over the next 10 years, but its relationship with **Interstate conflict** was not highlighted (Figure 2.8). Concerted attempts at cyberattacks against Ukraine were made last year, including against communication services, financial websites and electricity grids. Data theft and deep-fake technology also sought to prevent access to services, targeting flows of refugees, medicines, food and relief supplies.[82] The critical functioning of whole economies will only become more exposed with breakthroughs in dual-use technologies, most notably quantum computing.

Acting today

An international environment that is at greater risk of conflict and the less transparent attribution of unconventional engagement may weaken the shared moral, reputational and political costs that partially act as a deterrent to the deployment of destructive weaponry, including nuclear engagement. Undoubtedly, the strengthening of arms control, disarmament and non-proliferation agreements and norms, covering both existing and newer forms of military technologies, are essential to provide transparency. This can also reduce the risk of unintended escalation, for example by limiting the spillover of conflicts across domains, such as a cyberattack on critical infrastructure escalating into a targeted destructive exchange with lethal autonomous weapons.[83] Establishing norms will be essential to ensuring the right balance is struck so that technological innovation can continue to be harnessed to improve socioeconomic outcomes for humanity.

However, achieving effective arms control will be even more challenging than in the past. It will require engagement with a broader range of actors – including academic researchers and the private sector – given the dual-usages of many of these technologies. Developments are quickly outpacing global governance processes. An escalating arms race will further hinder collaboration, but the regulation of new weapons technologies to control proliferation and usage can only be achieved through transnational cooperation. The first step should include greater recognition by global powers of the strategically beneficial value to agreements on key arms control issues. In the longer term, new strategies for global governance that can adapt to this new security context must be explored to assuage the concerns of nations and avoid a spiral of instability and accidental or intentional destruction.

2.5 Digital rights: privacy in peril

Digital tools - increasingly sophisticated AI applications, interoperable edge computing and Internet of Things (IOT) devices, autonomous technologies - underpin the functioning of cities and critical infrastructure today and will play a key role in developing resilient solutions for tomorrow's crises. Yet these developments also give rise to new challenges for states trying to manage the existing physical world and this rapidly expanding digital domain.

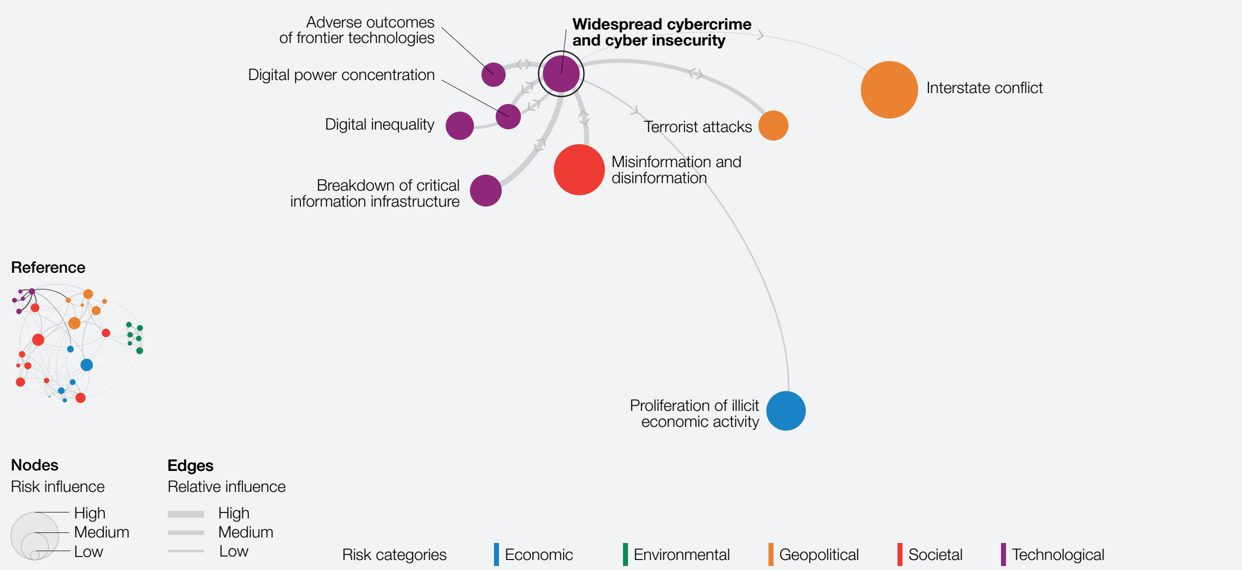
Based on GRPS results, **"Widespread cybercrime and cyber insecurity"** is a new entrant into the top 10 rankings of the most severe risks over the next decade.

As highlighted in last year's Global Risks Report chapter 'Digital Dependencies and Cyber Vulnerabilities', malicious activity in cyberspace is growing, with more aggressive and sophisticated attacks taking advantage of more widespread exposure. It was seen as a persistent threat by GRPS respondents as well as a strong driver of other risks (Figure 2.9).

The proliferation of data-collecting devices and data-dependent AI technologies could open pathways to new forms of control over individual autonomy. Individuals are increasingly exposed to the misuse of personal data by the public and private sector alike,

FIGURE 2.9

Risk interconnections: cyber insecurity



Source

World Economic Forum, Global Risks Perception Survey 2022-2023.

ranging from discrimination of vulnerable populations and social control to potentially bioweaponry.[84]

Not all threats to the digital autonomy and sovereignty of individuals are malicious in nature. Larger data sets and more sophisticated analysis also heighten the risk of the misuse of personal information through legitimate legal mechanisms, weakening the human right to privacy,[85] even in democratic and strongly regulated regimes. Legal incursions on privacy can be motivated by public safety considerations, crime prevention and response, economic development and better health outcomes. The privacy of personal and sensitive data is coming under increasing pressure by national security concerns, combining the protection of societies and states and the desire to gain a competitive technological and economic advantage.

Commercialized privacy

The right to privacy as it applies to information about individuals incorporates two key elements: the right not to be observed and the right to control the flow of information when observed.[86] As more data is collected and the power of emerging technologies increases over the next decade, individuals will be targeted and monitored by the public and private sector to an unprecedented degree, often without adequate anonymity or consent.[87]

Surveillance technologies are becoming increasingly sophisticated through new technologies and techniques for gathering and analyzing data. The oft-cited examples are biometric identification technologies. In recognition of the potential risks posed to privacy and the freedom of movement, some companies have self-regulated the sale of facial recognition to law enforcement, and the use of this technology in public spaces faces an upcoming ban in the EU.[88] Concerns also extend to the use of biometric technologies to analyze emotions. Other forms of monitoring are already becoming commonplace. Automated AI-based tools such as chatbots collect a wide amount of personal data to function effectively. The mass move to home working during the pandemic has led to tracking of workers through cameras, keystroke monitoring, productivity software and audio recordings – practices which are permitted under data-protection legislation in certain circumstances, but which collect deeper and more sensitive data than previous mechanisms.[89]

More insidiously, the spread of networked data is increasing surveillance potential by a growing number of both public- and private-sector actors, despite stringent regulatory protection.[90] As our lives become increasingly digitalized over the next decade, our "everyday experience" will be recorded and commodified through internet-enabled devices, more intelligent infrastructure and "smart" cities – a passive, pervasive and persistent form of networked observations that are already being used to create targeted profiles.[91] This pattern will only be enhanced by the metaverse, which could collect and track even more sensitive data, including facial expressions, gait, vital signs, brainwave patterns and vocal inflections.[92]

Individuals have usually consented to the collection of data for the associated beneficial use of the service or product, given the wave of new and stronger data protection policies in many markets.[93] However, as the collection, commercialization and sharing of data grows, consent in one area may reveal far more than intended when aggregated with other data points. This is known as the "mosaic effect", which gives rise to two key privacy risks: re-identification and attribute disclosure.[94] Research suggests that 99.98% of US residents could be correctly re-identified in any data set – including those that are heavily sampled and anonymized – using 15 demographic attributes.[95] Researchers have used this theory to uncover the political preferences of streaming users,[96] match DNA from publicly-available research databases to randomly selected individuals,[97] and link medical billing records from an open data set to individual patients.[98]

In consequential terms, this means that an international organization may share anonymized data with partner governments to support effective and efficient crisis responses. However, when combined with other data sets, it could allow the identification and tracking of vulnerable refugees and displaced persons – or compromise the location of camps and the supply chains of critical goods.[99] Data on race, ethnicity, sexual orientation and immigration status can be legally obtained in some markets and re-identified to varying degrees, enabling civil harassment and abuse. In one such example, the sexual orientation of a priest was obtained through the purchase of smartphone location data and announced by a religious publication.[100]

Data-enabled anocracies

The right to privacy is not absolute; it is traded-off against government surveillance and preventative policing for the purposes of national security. However, the surveillance potential of data has meant that access to sensitive information can increasingly be obtained without due process or transparency.[101] In some cases, data protection laws that require consent effectively waive the legal protections against electronic surveillance of private communications and location data.[102]

In the United States of America, data is aggregated and sold on the open market with limited regulatory restrictions, meaning enforcement agencies can purchase GPS location data without warrants or public disclosure. For example, theoretically, police could use automated licence plate data (obtained by both private- and public-sector organizations) to prosecute out-of-state abortions – leading Google to announce that it would auto-delete location data for users that visit related centres.[103] There is also increasing political and regulatory pressure to weaken encryption mechanisms adopted by private companies, particularly as it relates to terrorist investigations, despite broader implications to the ongoing security of civilians' data.[104]

Potential for misuse will be especially problematic for users residing in countries with poor digital rights records, inadequate regulatory protection frameworks, or authoritarian tendencies. Forms of digital repression to quell politically motivated uprisings, such as the use of spyware to track activist activities, are already driving significant human rights violations in the Middle East.[105] Recent reports have also highlighted potential digital rights violations in Africa stemming from the rapid expansion of biometric programmes that include voter registration, CCTV with facial recognition, mandatory SIM card registration and refugee registration.[106] As more emerging markets look towards progressing their smart city plans, the collection of sensitive citizen data could expose societies to additional peril if poorly governed and protected.[107]

Security concerns posed by sensitive data and its potential abuse are well-recognized by governments. Countries have adopted more widespread data localization policies, tightened regulation of research collaborations, and banned some foreign-owned companies from certain markets, including telecommunications, surveillance equipment and mobile applications, to limit the collection and possession of sensitive data by non-allied states.[108] Yet, less attention is being paid to the potential for overreach and abuse of this data in the name of national security. The slow and legal erosion of the digital sovereignty of individuals can have unintended and far-reaching consequences for social control and the erosion of democracies – including, for example, by compromising freedom of the press.

Growing trade-offs between innovation and security

Data is an important factor of production, and collection and flows are essential to fuel innovation for enhanced economic productivity (including automation), as well as socially beneficial uses.[109] More expansive and innovative applications of AI and other emerging technologies will require cross-industry and public-private data aggregation. The centralization and consolidation of some types of data can lend a competitive advantage to economies, such as through improved health outcomes associated with advances in biotechnology.[110] Yet governments may also increasingly struggle to balance the potential harm of privacy loss against the benefits of more rapid development of emerging technologies.

At the same time, to address the growing concentration of data in the hands of a small number of private-sector companies, governments may increasingly push for open-data policies from both public- and private-sector sources, mirroring recent regulatory moves by the EU around data spaces and marketplaces.[111] Such policies – like the creation of public data trusts for research purposes – will likely affect both domestic companies and industries, as well as allied countries. This may benefit more widespread and diffused innovation, but it will also expand risks as they enable privacy breaches at a much larger scale. Privacy will strongly influence these agreements: the US government recently committed to heightened safeguards for transatlantic data flows, including from US intelligence activities.[112]

However, many of these data sets may still be subject to the threat of re-identification, even with recent developments in privacy-enhancing technologies such as synthetic data, federated learning and differential privacy.[113] Research suggests that sensitive databases and technologies, such as pools of biological data and DNA sequencing, are already vulnerable to attack.[114] Sensitive health data is governed inconsistently and the creation of large pools of personal data are creating lucrative targets for cybercriminals, particularly given the less stable geopolitical environment and limited norms currently governing cyberwarfare. The potential consequences of the large-scale theft of biometric or genomic information are largely unknown but may allow for targeted bioweaponry.

Acting today

At a national level, a patchwork of fragmented data policy regimes at local or state levels raises the risk of accidental and intentional abuses of data in a manner that was not considered by the individual's original consent. Harmonizing policies at a national

level will enable more effective, less complicated cross-border data-sharing mechanisms to power innovation while still ensuring adequate protection for individuals.

Developing a more globally consistent taxonomy, data standards, and legal definition of personal and sensitive information is a key enabler. These frameworks should recognize that sensitivity can rise from data-driven inferences that are enabled by large data sets, the proliferation of online social networks, and the blurring of personal and industrial data in the roll-out of the IOT and implementation of "smarter" cities.[115] For example, one company was recently fined under the EU's GDPR (General Data Protection Regulation) for targeted advertising that inferred a medical condition (deemed as a special category of data) on the basis of purchase history.[116]

Historically severe fines for data loss are also helping change the cost-benefit assessment around investment in cybersecurity measures, but questions remain around the individual rights to action, damage and compensation in cases of breach.[117] It will be incumbent on organizations to consider the ethics of data collection and usage to minimize reputational considerations beyond regulatory compliance. In addition, spurred by both increased cyberattacks and tighter data laws, the voluntary disposal and destruction of personal data may become a stronger priority – with potential environmental co-benefits of minimizing data storage needs. Finally, governments will also need to development emergency capabilities to respond to data breaches and violation of privacy to minimize follow-on repercussions.

2.6 Economic stability: global debt distress

The threat of a sovereign debt crisis has been brewing, with public debt growing as interest rates have fallen. Governments have leveraged cheap money to invest in future growth and help stabilize distressed financial systems, providing massive fiscal support during the pandemic and to shield households and businesses from the current cost-of-living crisis. However, high levels of debt may not be sustainable under tighter economic conditions. The rapid and widespread normalization of monetary policies, accompanied by a stronger US dollar and weaker risk sentiment, has already increased debt vulnerabilities that are likely to remain heightened for years.

Stagflation on a global scale, combined with historically high levels of public debt, could have vast consequences.[118] Even with a softer landing, the consequences of debt-trap diplomacy and rockier restructuring raise the risk of debt distress – and even default – spreading to more systemically important markets, paralysing the global economic system. Further, even comparatively orderly fiscal consolidation is likely to impact spending on human capital and development, ultimately threatening the resilience of economies and societies in the face of the next global shock, whatever form it might take.

The rising price of debt

General government gross debt in advanced economies hit 112% of GDP in 2022, compared to roughly 65% of GDP for emerging and developing markets.[119] Yet as identified in **Chapter 1.2, Economic downturn**, some developing and emerging markets are feeling the impacts of tightening monetary policy and deteriorating economic conditions first and most acutely. For example, Ghana recently reached an agreement with the IMF regarding a $3 billion bailout and Zambia is seeking to conclude restructuring of $15 billion in external debt early this year. A broad-based global recession within the year[120] could temper inflation and cap interest rate rises, but there is a higher risk of balance-of-payments crisis in the short-term, alongside a credit crunch over the mid to longer term.[121] Emerging market banks also hold a larger proportion of domestic public debt, with the potential for distress to spread to banks, households and pension funds.[122] Larger emerging markets exhibiting a heightened risk of default include Argentina, Egypt, Ghana, Kenya, Tunisia, Pakistan and Türkiye.[123]

Downside risks loom large, and another global shock could result in deeper and more prolonged economic disorder. Stagflation remains a severe risk for many economies. Current crises, such as the war in Ukraine and lingering impacts of COVID-19, are still impacting basic inputs, including labour, energy and food. Continued tightness in major labour markets may exacerbate wage inflation – meaning there may need to be a material increase in unemployment to contain consumer inflation. Extended supply-driven inflation could drive more painful interest rate rises, even amidst a slowdown in growth, leading to a harder landing and more widespread debt distress. A more systemically important emerging and developing economy – the likes of Mexico, South Africa and Poland – could face distress in coming years, raising the risk of financial contagion.[124]

As cautioned by the International Monetary Fund (IMF), miscalibration between fiscal and monetary policies could exacerbate this further, and in unexpected markets.[125] Questions around the independence of central banks risk de-anchoring market expectations, and monetary intervention to counteract inflationary fiscal policies will only heighten the risk of longer economic malaise. The United Kingdom of Great Britain's near-crisis in September last year is an example of the potential instability that could arise. The interest payable on the country's public debt is expected to hit £120.4 billion for the financial year ending March 2023, up from £69.9 billion, the highest on record.[126] The Bank of England raised rates from 0.1% in December 2021 to 3.5% in December 2022, yet was forced to intervene with an emergency quantitative easing programme in September to counter the market reaction to the UK government’s proposed fiscal stimulus.[127] In the absence of a global shock, the “veto power” of the markets will increasingly limit fiscal expansion, even in advanced economies.[128]

The new geopolitics of debt

For now, the ratio of defaulted versus total global public debt remains very low by historic standards and far lower than peaks experienced in the 1980s (Figure 1.6). However, this partially reflects the growth in absolute public debt levels. Despite record IMF emergency lending and a $650 billion allocation in special drawing rights,[129] more than 54 countries are currently in need of debt relief, representing less than 3% of the global economy. Yet these countries represent 18% of the global population and account for more than 50% of people living in extreme poverty.[130] Fears of contagion and further capital flight could weaken debt sustainability in a growing number of lower-income countries. The scale of debt defaults will influence the depth of available restructuring, with some creditor countries hesitant to bail out distressed states on sufficiently concessionary terms, due to their own tightening fiscal space and rising domestic needs. There may also be a shift away from overseas development assistance towards loans to continue to support development and wield economic power. This has a lower domestic cost but exacerbates the debt burden on these markets and increases the risk of a larger wave of defaults in the future.

It is not only the scale but the complexity of potential debt restructuring and need for global cooperation that will determine the extent to which defaults can be contained (Figure 2.10). Creditors have expanded to include quasi-sovereign entities and the private sector, such as commodity traders and producers. Although this expansion has provided new avenues of financing, the coordination of relief between international organizations, the "Paris Club" and other state creditors, as well as the private sector will continue to complicate attempts at restructuring. For example, only three countries – Chad, Ethiopia and Zambia – are currently undergoing treatment under the G20 Common Framework for Debt Treatments. All remain unresolved, reflecting challenging geopolitical and economic dynamics as well as a lack of transparency.[131]

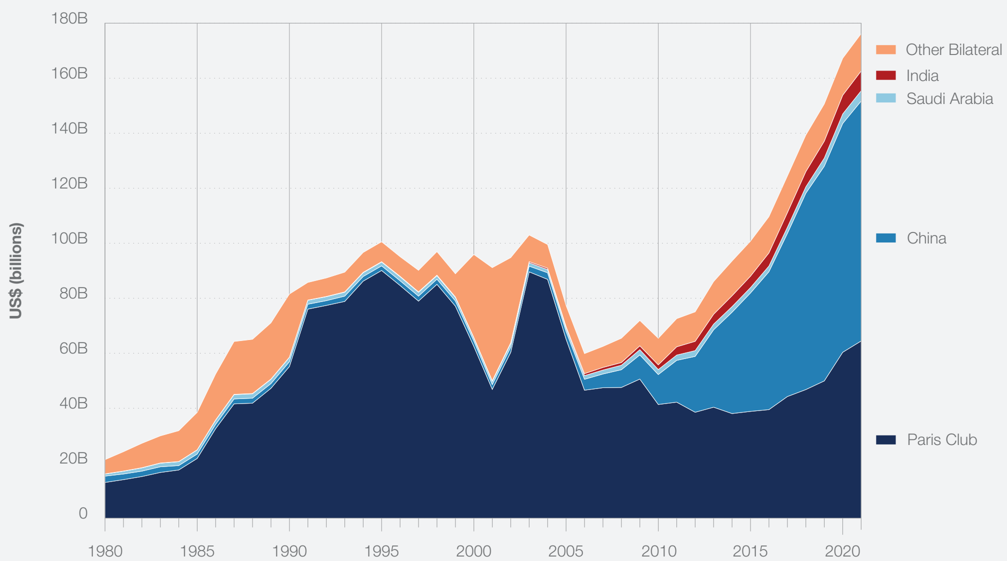
The call for wealthier economies to intervene bilaterally is growing – likely increasing longer-term geopolitical tensions. China has become a large bilateral creditor to many low-income countries and, by some estimates, has become the largest official creditor globally.[132] Energy exporters, such as the Middle East and the United States of America, are also well-placed to step into the gap over the medium-term. Renewed soft power approaches and debt-trap diplomacy could redraw regional and global political lines, driving currency blocs and possibly exacerbating pressures on developing countries as supply chains shift to mirror economic alliances.[133] This trend could also destabilize security dynamics, as debt is leveraged to pull developing economies into the military expansion of larger powers (see Chapter 2.4: Human security).

Yet as the number of sovereign defaults grow, creditor countries and companies could become more exposed to debt contagion, including systemically important banks, pension funds and state creditors. This will interact with other domestic debt vulnerabilities, including the private sector

FIGURE 2.10

The composition of public debt

A. Bilateral general government debt



Source

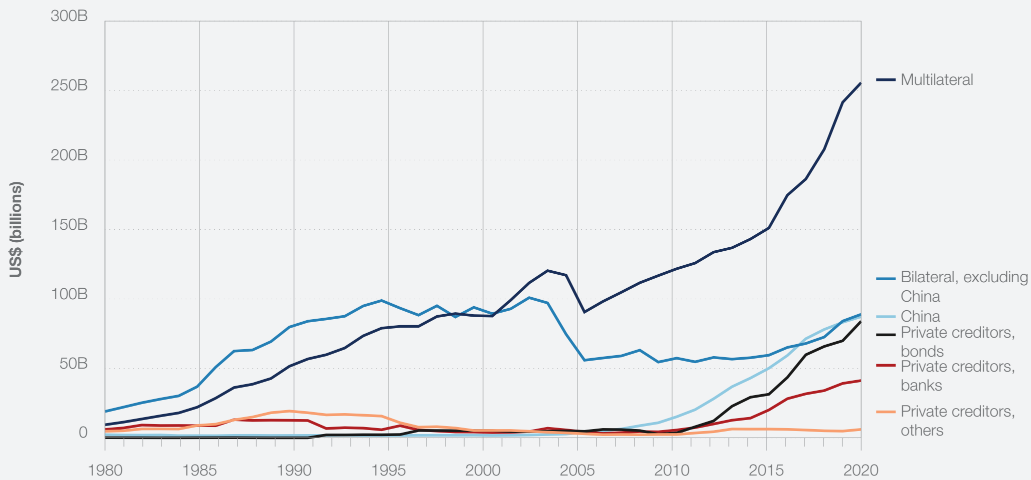
World Bank, International Debt Statistics database.[134]

Note

Bilateral Government Debt for 68 of the 72 Debt Service Suspension Initiative (DSSI) countries by creditor.

FIGURE 2.10 The composition of public debt

B. General government debt



Source

World Bank, International Debt Statistics database.[134]

Note

General Government Debt for 68 of the 72 Debt Service Suspension Initiative (DSSI) countries by creditor type.

and state-owned entities,[135] to raise aggregate exposure and place pressure on the solvency of even advanced and large emerging economies. A sovereign debt default in a systemically important economy could result in systemic proliferation with a devastating impact on a global scale.

A looming investment shortfall

Even in the absence of a global crisis, the 1980s "lost decade" of development in Latin America and Sub-Saharan Africa provides a very real example of the economic and humanitarian crisis that can arise from a sovereign debt default, including currency free falls, collapses in output, cost-of-living crises and rapid increases in poverty. The 41 countries that defaulted on their debt in the first half of the decade required eight years, on average, to reach their pre-crisis GDP per capita.[136] Debt distress and restructuring will also have an impact on investment. According to GRPS results, the risk of **Debt crises** drops in perceived severity over the longer-term time frame, but the **Collapse or lack of public infrastructure and services** becomes more severe. The ability to finance continued productivity and resilience will be hampered by economic and political dynamics on both a global and national level.

Advanced economies will have more autonomy to invest in future priorities, while developing markets may be more beholden to the demands of the creditor, meaning money could be diverted from the areas of greatest social need, including expenditure in public goods and infrastructure. Beyond the growing financial cost of natural disasters, emerging and developing economies will need to spend a higher proportion of GDP on the green transition and sustainable infrastructure, with knock-on ramifications for other public spending and services.[137] By contrast, within the limits of inflationary pressures, advanced economies can continue to leverage more accessible financing for economic development, such as stronger industrial policy, to underpin the energy transition, widening the divide between countries. Necessary fiscal consolidation in emerging and developing economies may also rely heavily on spending cuts, which could rapidly remove social protection available to low-income and vulnerable populations, increasing poverty and inequality within countries, alongside social and political unrest.

Yet in a structurally different low-growth, low-investment economic era, even advanced economies will need to make trade-offs. Rising unemployment, social unrest and political polarization, and even technologically-driven churn in both blue- and white-collar jobs may influence the prioritization of current expenditure over longer-term capital expenditure, while security considerations may mean there is less fiscal headroom for social and environmental development over the medium term. The potential result is the de-prioritization of investment and slow decay of public infrastructure and services in both developing and advanced markets.[138] Around two-fifths of low- and lower-middle-income countries cut expenditure on education by an average of 13.5% since 2020, which, despite a minor rebound, fell again in 2022.[139] As referenced in **Chapter 2: Human health**, the lingering economic, educational and healthcare overhang of the pandemic continues to weaken the capacity of public systems that also face compounding pressure from ageing populations in advanced economies, and rapidly expanding populations in some developing markets. This is a slow-burning risk: impacts are subtle, lagged and cumulative in nature, but can be highly corrosive in overall impact to the strength of human capital and development – a critical mitigant to the impact and likelihood of other global risks.

Acting today

In recognition of the risks posed to broader financial stability, timely and deeper debt write-downs could allow a faster return to developmental progress for vulnerable countries and render a future default less likely. The private sector could be incentivized to participate in debt restructuring through a variety of mechanisms, including issuing of new bonds with stronger legal protections, loss reinstatement commitments and value recovery instruments – with the latter enabling private creditors to gain from upside developments in debtor countries in the future, such as GDP-linked instruments in Costa Rica, Argentina, Greece and Ukraine.[140]

As a complementary mechanism to more comprehensive debt restructuring, there may be increased deployment of debt-for-development deals (see **Chapter 2.2: Natural ecosystems**), particularly relating to climate-positive adaptation, to help break the correlation between exposure to climate change and debt vulnerability.[141] However, this should not just be limited to environmental concerns. Social bond issuances have already jumped sevenfold, to $148 billion in 2022, targeting healthcare, education and small and medium-sized enterprises.[142] While debt swaps may not create fiscal space beyond the specific objective, SDG-linked conditionality may enhance the willingness of creditors to consider debt relief, particularly for countries where other forms of fiscal support, including write-downs and conditional grants, may be less likely.[143]

Finally, we are unlikely to be able to double down on debt to the same extent to cushion the next crisis. A more proactive approach to countries that are not yet on the verge of debt distress could help mitigate the systemic risk of sovereign debt contagion. Recognition of simultaneous crises – debt, climate impacts and food security – could be integrated into greater flexibility and more concessional forms of financing available to vulnerable markets. With particular respect to the climate agenda, there is a growing expectation that packages will include grants, rather than rely solely on loans that add to overall debt burdens.[144] Bilateral and multilateral underwriting of risk could also enable much-needed flows of private capital, while support for longer-term projects that can help crowd-in private capital, such as the IMF's Resilience and Sustainability Trust, is also critical.[145]

Endnotes

1. Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), *The global assessment report on biodiversity and ecosystem services*, 2019, https://ipbes.net/sites/default/files/2020-02/ipbes_global_assessment_report_summary_for_policymakers_en.pdf.

2. Surminski, Swenja, Claudio Saffioti and Sumer Drall, "Embracing Nature: How Businesses Can Engage with New Environmental Imperatives", *Marsh McLennan*, 27 September 2022, https://www.marshmclennan.com/content/dam/mmc-web/insights/publications/2022/september/Marsh%20McLennan%20Embracing%20Nature_Sep27.pdf.

3. World Wildlife Foundation (WWF), *Living Planet Report 2022: Building a nature-positive society*, 2022, https://wwflpr.awsassets.panda.org/downloads/lpr_2022_full_report.pdf; Habibullah, Muzafar Shah, Badariah Haji Din, Siow-Hooi Tan and Hasan Zahid, "Impact of climate change on biodiversity loss: global evidence", *Environmental Science and Pollution Research*, vol. 9, 3 August 2021, pp. 1073-1081.

4. World Wildlife Foundation (WWF), *Living Planet Report 2022: Building a nature-positive society*, 2022, https://wwflpr.awsassets.panda.org/downloads/lpr_2022_full_report.pdf.

5. Pörtner, Hans-Otto (Ed.), et al., *Climate Change 2022: Impacts, Adaptation and Vulnerability*, Intergovernmental Panel on Climate Change (IPCC), 2022, https://www.ipcc.ch/report/ar6/wg2/.

6. Ibid.

7. Over one-fifth of the total buffer pool has been depleted in less than a decade. See: Badgley, Grayson, et. al, "California's forest carbon offsets buffer pool is severely undercapitalized", *Frontiers in Forests and Global Change*, 5 August 2022.

8. Gatti, Luciana V,. et al., "Amazonia as a carbon source linked to deforestation and climate change", *Nature*, vol. 595, 2021, pp. 388-393; World Meteorological Organization, *Greenhouse Gas Bulletin*, 2022; Hook, Leslie and Chris Campbell, "Methane hunters: what explains the surge in the potent greenhouse gases?", *Financial Times*, 23 August 2022.

9. World Wildlife Foundation (WWF), *Living Planet Report 2022: Building a nature-positive society*, 2022, https://wwflpr.awsassets.panda.org/downloads/lpr_2022_full_report.pdf.

10. Kenneth Research, *Vertical Farming Market Analysis 2022-2033*, 31 October 2022.

11. Weidner, Till, "A holistic look at vertical farming's carbon footprint and land use", *Agritecture*, 9 May 2022. https://www.agritecture.com/blog/2022/5/9/a-holistic-look-at-vertical-farmings-carbon-footprint-and-land-use; Weidner, Till, Aidon Yang, Florian Forster and Michael W. Hamm, "Regional conditions shape the food-energy-land nexus of low-carbon indoor farming", *Nature Food*, vol. 3, 2022, pp. 206-216, https://www.nature.com/articles/s43016-022-00461-7.

12. Lambin, Eric F. and Patrick Meyfroidt, "Global Land Use Change, Economic Globalization, and the Looming Land Scarcity", *Proceedings of the National Academy of Sciences 108*, vol. 9, 2011, pp. 3465–3472, https://doi.org/10.1073/pnas.1100480108.

13. Tilman, David, Michael Clark, David R. Williams, Kaitlin Kimmel, Stephen Polasky and Craig Packer, "Future Threats to Biodiversity and Pathways to Their Prevention", *Nature,* vol. 546, no. 7656, 2017, pp. 73–81, https://doi.org/10.1038/nature22900.

14. White, Natasha, "Debt-for-Nature swaps gain traction among developing countries", *Bloomberg*, 7 November 2022, https://www.bloomberg.com/news/articles/2022-11-07/debt-for-nature-swaps-offer-option-for-developing-countries?leadSource=uverify%20wall.

15. Baldwin, Clare, Marc Jones and Simon Jesspo, "Bankers bet billions on new wave of debt-for-nature deals", *Reuters*, 17 November 2022, https://www.reuters.com/business/cop/bankers-bet-billions-new-wave-debt-for-nature-deals-2022-11-17/.

16. Karlsruher Institut für Technologie. "Trade-off between biodiversity and food security in land use", *Science Daily*, 18 February 2022, https://www.sciencedaily.com/releases/2022/02/220218100712.htm.

17. Tzay, José Francisco Calí, "Indigenous Peoples Still Suffer from Poverty, Climate Change and Loss of Ancestral Lands, Delegates Highlight in Third Committee", *United Nations General Assembly Seventy-Seventh Session, 16th Meeting*, New York, 12 October 2022, https://press.un.org/en/2022/gashc4350.doc.htm.

18. FAO Commission on Genetic Resources for Food and Agriculture, *Biodiversity for Food and Agriculture*, 2019, https://www.fao.org/state-of-biodiversity-for-food-agriculture/en/,.

19. Gasparatos, Alexandros, et al., "Renewable energy and biodiversity: Implications for transitioning to a Green Economy", *Renewable and Sustainable Energy Reviews*, vol. 70, 2017, pp 161-184, https://www.sciencedirect.com/science/article/pii/S1364032116304622#s0060.

20. Kang, Dake, Victoria Milko and Lori Hinnant, "'The Sacrifice Zone': Myanmar bears cost of green energy", *AP News*, 9 August 2022, https://apnews.com/article/technology-forests-myanmar-75df22e8d7431a6757ea4a426fbde94c; UN Environment Programme (UNDEP), *Can the Democratic Republic of the Congo's mineral resources provide a pathway to peace?*, 20 September 2022; Global Witness, Myanmar's poisoned mountains, 9 August 2022, https://www.globalwitness.org/en/campaigns/natural-resource-governance/myanmars-poisoned-mountains/.

Endnotes

21. Marsh, René, "Billionaires are funding a massive treasure hunt in Greenland as ice vanishes", *CNN*, 8 August 2022, https://edition.cnn.com/2022/08/08/world/greenland-melting-mineral-mining-climate/index.html; Pearce, Fred, "Why the rush to mine lithium could dry up the High Andes", *Yale Environment 360*, 19 September 2022, https://e360.yale.edu/features/lithium-mining-water-andes-argentina.

22. Miller, K. A., et al., "Challenging the Need for Deep Seabed Mining From the Perspective of Metal Demand, Biodiversity, Ecosystems Services, and Benefit Sharing", *Frontiers in Marine Science*, 29 July 2021, https://www.frontiersin.org/articles/10.3389/fmars.2021.706161/full.

23. IPCC, *Climate Change 2021: The Physical Science Basis*, 2021, https://report.ipcc.ch/ar6/wg1/IPCC_AR6_WGI_FullReport.pdf.

24. Trisos, Christopher, et al., "Potentially dangerous consequences for biodiversity of solar geoengineering implementation and termination", *Nature Ecology & Evolution*, vol. 2, 2018, pp. 475-482; Innovative Genomics Institute, *Supercharging Plants and Soils to Remove Carbon from the Atmosphere*, 14 June 2022; Gibbens, Sarah, "Activists fear a new threat to biodiversity – renewable energy", *National Geographic*, 26 May 2022; Gasparatos, Alexandros, et al., "Renewable energy and biodiversity: Implications for transitioning to a Green Economy", *Renewable and Sustainable Energy Reviews*, vol. 70, 2017, pp. 161-184; Sovacool, Benjamin K., Chad Baum and Sean Low, "Risk-risk governance in a low-carbon future: Exploring institutional, technological, and behavioural tradeoffs in climate geoengineering pathways", *Risk Analysis*, 4 May 2022, https://onlinelibrary.wiley.com/doi/10.1111/risa.13932; Parker, Andy and Peter Irvine, "The Risk of Termination Shock from Solar Geoengineering", *Earth's Future*, 11 March 2018, https://agupubs.onlinelibrary.wiley.com/doi/full/10.1002/2017EF000735; Carlson, Colin J., et. al., "Solar geoengineering could redistribute malaria risk in developing countries", *Nature Communications*, vol. 13, 20 April 2022, https://www.nature.com/articles/s41467-022-29613-w.

25. Abulu, Latoya, "On Indigenous Peoples' Day, five inspirational conservation stories in the US", *Mongabay*, 10 October 2022, https://news.mongabay.com/2022/10/on-indigenous-people-day-five-inspirational-nature-conservation-stories/.

26. Hariharan, Kavitha, Adrienne Cernigoi, and Jordan Lee, "Life support: A people prescription for resilient health systems", *Marsh McLennan*, November 2022, https://www.marshmclennan.com/insights/publications/2022/november/life-support-a-people-prescription-for-resilient-health-systems.html.

27. Erinoso, Olufemi, "Post-COVID-19 condition: current evidence and unanswered questions", *The Lancet*, vol. 10, iss. 9, September 2022; David M., "The Economic Cost of Long COVID: An Update", *Harvard University*, 16 July 2022, https://scholar.harvard.edu/cutler/news/long-covid,; Mirin, Arthur A., "A preliminary estimate of the economic impact of long COVID in the United States", *Fatigue: Biomedicine, Health & Behaviour*, vol. 10, iss. 4, 17 July 2022, pp. 190-199, https://www.tandfonline.com/doi/abs/10.1080/21641846.2022.2124064; Black, Euan, "Long COVID-19 costing Australia $100m a week", *Financial Review*, 9 September 2022, https://www.afr.com/work-and-careers/workplace/long-covid-19-costing-australia-100m-a-week-20220909-p5bgq1.

28. World Health Organization (WHO), *Tuberculosis deaths and disease increase during the COVID-19 pandemic*, [Press release], 27 October 2022, https://www.who.int/news/item/27-10-2022-tuberculosis-deaths-and-disease-increase-during-the-covid-19-pandemic.

29. Chumakov K, E. Ehrenfeld, V.I. Agol and E. Wimmer, "Polio eradication: falling at the final hurdle?", *The Lancet*, 1 October 2022.

30. Romanello, Marina, et al., "The 2022 report of the Lancet Countdown on health and climate change: health at the mercy of fossil fuels", *The Lancet*, vol. 400, iss. 10363, 25 October 2022, pp. 1619-1654.

31. McKeever, Amy, "Why climate change is still the greatest threat to human health", *National Geographic*, 9 September 2021, https://www.nationalgeographic.com/science/article/why-climate-change-is-still-the-greatest-threat-to-human-health.

32. Institute for Health Metrics and Evaluation (IHME), *Global Burden of Disease Study 2019*, https://ghdx.healthdata.org/gbd-2019, accessed 21 November 2022.

33. WHO, *WHO Coronavirus (COVID-19) Dashboard*, https://covid19.who.int/, accessed 21 November 2022; Mallapaty, Smriti, "China COVID wave could kill one million people, models predict", Nature, 19 December 2022, https://www.nature.com/articles/d41586-022-04502-w.

34. Murray, C.J.L., "Global burden of bacterial antimicrobial resistance in 2019: a systematic analysis", *The Lancet*, vol. 399, iss. 10325, 12 February 2022, pp. 629-655.

35. Fuller, Richard, et al., "Pollution and health: a progress update", *The Lancet Planetary Health*, vol. 6, iss. 6, 17 May 2022.

36. Financial Times, *Backlog Britain: How public-sector delays spiralled to record levels*, 27 November 2022, https://www.ft.com/content/ffdbd69b-1c7e-4fb2-b10a-d62c644bb988.

37. See World Health Organization: https://www.who.int/health-topics/health-workforce#tab=tab_1. Accessed 28 November 2022.

38. Mercer, *Global insurer report: MMB health trends 2023*, https://www.mercer.com/our-thinking/health/health-trends-report.html, 2022.

Endnotes

39. Statistica Research Department, *U.S. health expenditure as percent of GDP 1960-2020*, 1 December 2022, https://www.statista.com/statistics/184968/us-health-expenditure-as-percent-of-gdp-since-1960/.

40. Hariharan, Kavitha, Adrienne Cernigoi and Jordan Lee,"Life Support: A People Prescription for Resilient Health Systems", Marsh McLennan, 2022, https://www.marshmclennan.com/insights/publications/2022/november/life-support-a-people-prescription-for-resilient-health-systems.html.

41. Singer, Merrill, "A dose of drugs, a touch of violence, a case of AIDS: conceptualising the SAVA syndemic", *Free Inquiry in Creative Sociology*, vol. 24, no. 2, 1 May 1996.

42. McGowan, Victoria, "COVID-19 mortality and deprivation: a pandemic, syndemic and endemic health inequalities", *The Lancet Public Health*, vol. 7, iss. 11, 1 November 2022; Mendenhall, Emily, Brandon A. Kohrt, Carmen H. Logie and Alexander Tsai, "Syndemics and clinical science", *Nature Medicine*, vol. 28, 21 July 2022, pp. 1359-1362.

43. Schwartz, Sheree R., et al., "The immediate effect of the Same-Sex Marriage Prohibition Act on stigma, discrimination, and engagement on HIV prevention and treatment services in men who have sex with men in Nigeria: analysis of prospective data from the TRUST cohort", *The Lancet HIV*, vol. 2, no. 7, 1 June 2015.

44. Marmot, Michael, "A generation of Britons face long-term illness from being cold and poor this winter", *The Guardian*, 1 September 2022, https://www.theguardian.com/commentisfree/2022/sep/01/generation-britain-long-term-illness-cold-poor-winter-cost-of-living-crisis.

45. Lazarus, Jeffrey V., et. al., "Revisiting COVID-19 Vaccine Hesitancy around the World Using Data from 23 Countries in 2021", *Nature Communications*, vol. 13, July 1, 2022. Bhanani, L. Y. and B. Franz, "A meta-analysis of COVID-19 vaccine attitudes and demographic characteristics in the United States", *Public Health*, vol. 27, June 2022, pp 31-38.

46. Kuchler, Hannah,"Revolutionary Crispr gene editing speeds from lab to treatment room", *Financial Times*, 19 August 2022, https://www.ft.com/content/e3c12117-190c-4fc9-9988-57eb9ab9de56.

47. United Nations, *UN condemns brutal killing of eight polio workers in Afghanistan*, 24 February 2022, https://news.un.org/en/story/2022/02/1112612.

48. Institute for Health Metrics and Evaluation (IHME), *The Lancet: Latest global disease estimates reveal perfect storm of rising chronic diseases and public health failures fuelling COVID-19 pandemic*, 15 October 2020, https://www.healthdata.org/news-release/lancet-latest-global-disease-estimates-reveal-perfect-storm-rising-chronic-diseases-and.

49. Institute for Economics and Peace (IEP), *Global Peace Index 2022: Measuring peace in a complex world*, 2022, https://www.visionofhumanity.org/wp-content/uploads/2022/06/GPI-2022-web.pdf.

50. Ibid.

51. Ibid.

52. Mason, Ra, "Commentary: Japan's Militarisation Gets a Boost from Ukraine War despite Pacifist Constitution", *CNA*, 17 May 2022, https://www.channelnewsasia.com/commentary/japan-increase-military-spending-pacifist-constitution-ukraine-china-2687661; Stockholm International Peace Research Institute (SIPRI), *World Military Expenditure Passes $2 Trillion for First Time*, 25 April 2022, https://www.sipri.org/media/press-release/2022/world-military-expenditure-passes-2-trillion-first-time.

53. Institute for Economics and Peace (IEP), *Global Peace Index 2022: Measuring peace in a complex world*, 2022, https://www.visionofhumanity.org/wp-content/uploads/2022/06/GPI-2022-web.pdf.

54. Perlo-Freeman, Samuel, *Rethinking Unconstrained Military Spending*, United Nations Office for Disarmament Affairs, UNODA Occasional Papers, No. 35, April 2020.

55. Carafano, James Jay, "Rapid Advancements in Military Tech." *GIS Reports* (blog), 19 January 2022, https://www.gisreportsonline.com/r/military-technology/.

56. United Nations Education Scientific Culture Organization (UNESCO), *Launch of the 2022 Survey of Research and Experimental Development Statistics for SDG 9.5* [Press release], 6 September 2022, http://uis.unesco.org/en/news/launch-2022-survey-research-and-experimental-development-statistics-sdg-9-5.

57. Cerdeiro, Diego, et al., "Sizing Up the Effects of Technological Decoupling", *International Monetary Fund*, IMF Working Papers, 12 March 2021, https://www.imf.org/en/Publications/WP/Issues/2021/03/12/Sizing-Up-the-Effects-of-Technological-Decoupling-50125.

58. Congressional Research Service, *Global Research and Development Expenditure: Fact Sheet*, 14 September 2022, https://sgp.fas.org/crs/misc/R44283.pdf.

59. North Atlantic Treaty Organization (NATO), *NATO leaders meet with key partners to address global challenges, Indo-Pacific partners participate in a NATO summit for the first time* [Press release], 29 June 2022, https://www.nato.int/cps/en/natohq/news_197287.htm.

60. McCarthy, Simone, "China and Cambodia break ground at naval base in show of 'iron-clad' relations", *CNN*, 9 June 2022, https://edition.cnn.com/2022/06/09/asia/china-cambodia-naval-base-military-intl-hnk/index.html.

61. Muggah, Robert, "The war against Ukraine has reached outer space", *iPolitics*, 17 March 2022, https://www.ipolitics.ca/opinions/the-war-against-ukraine-has-reached-outer-space.

Endnotes

62. Howarth, Josh, "6 Military Technology Trends to Watch (2022-2025)", *Exploding Topics*, 22 April 2022, https://explodingtopics.com/blog/military-technology-trends.

63. Congressional Research Service, *Defense Primer: Directed Energy Weapons*, 14 November 2022, https://sgp.fas.org/crs/natsec/IF11882.pdf.

64. Kallenborn, Zachary, *The role of electronic warfare, cyber and space capabilities in air littoral*, Atlantic Council, 30 August 2022; Lewis, Patricia and Beyza Unal, "Cyberattacks on Missile Systems", *Chatham House*, 2 July 2019; Dunn, Will, "Can nuclear weapons be hacked?", *The New Statesman*, 7 May 2018.

65. Institute for Peace Research and Security Policy (IFSH), *Negative Multiplicity: Forecasting the Future Impact of Emerging Technologies on International Stability and Human Security*, 2022, https://ifsh.de/en/publications/research-report/research-report-010.

66. Shoup, Timothy and August Leo Liljenberg, "Destruction Democratised", *Farsight*, 1 November 2022, https://farsight.cifs.dk/destruction-democratised/.

67. European Commission, *Changing security paradigm*, 2022, https://knowledge4policy.ec.europa.eu/changing-security-paradigm_en, accessed 31 October 2022; Gottemoeller, Rose, "The Case Against A New Arms Race: Nuclear Weapons Are Not The Future", *Foreign Affairs*, 9 August 2022.

68. Gottemoeller, Rose, "The Case Against A New Arms Race: Nuclear Weapons Are Not The Future", *Foreign Affairs*, 9 August 2022.

69. Stockholm International Peace Research Institute (SPIRI), *SPIRI Yearbook 2022: Armaments, Disarmament and International Security*, 13 June 2022; Grego, Laura, "A nuclear arms race is unavoidable without serious intervention", *Financial Times*, 27 October 2022.

70. ICAN, *States reaffirm support for Nuclear Weapons Ban Treaty at UN First Committee*, 29 October 2022, https://www.icanw.org/people_and_structure.

71. The Nuclear Threat Initiative, *The CNS North Korea Missile Test Database*, https://www.nti.org/analysis/articles/cns-north-korea-missile-test-database/, accessed 31 October 2022; Stockholm International Peace Research Institute (SPIRI), *SPIRI Yearbook 2022: Armaments, Disarmament and International Security*, 13 June 2022.

72. Dunn, Lewis A., *The disarmament, arms control, and non-proliferation implications of the invasion of Ukraine: what next for reducing global nuclear dangers*, United Nations Institute for Disarmament Research, 2022.

73. Vohra, Anchal, "The Post-Iran-Nuclear-Deal World Won't Be Pretty", *Foreign Policy*, 17 November 2022, https://foreignpolicy.com/2022/11/17/the-post-iran-nuclear-deal-world-wont-be-pretty/.

74. The decline in total number of nuclear weapons between 2021 and 2022 has been attributed to the dismantling of retired warheads. Institute for Economics and Peace, *Global Peace Index 2022: Measuring peace in a complex world*, 2022, https://www.visionofhumanity.org/wp-content/uploads/2022/06/GPI-2022-web.pdf.

75. Shoup, Timothy and August Leo Liljenberg, "Destruction Democratised", *Farsight*, 1 November 2022, https://farsight.cifs.dk/destruction-democratised/.

76. Zou, Bingun and Xingguang Peng, "A Bilateral Cooperative Strategy for Swarm Escort under the Attack of Aggressive Swarms", *Electronics*, 8 November 2022.

77. Wezeman, Pieter D., Alexandra Kuimova and Siemon T. Wezeman, *Trends in international arms transfers, 2021*, Stockhom International Peace Research Institute (SIPRI), SPIRI Fact Sheet, March 2022, https://www.sipri.org/sites/default/files/2022-03/fs_2203_at_2021.pdf.

78. European Commission, *Developments and Forecasts on Changing Security Paradigm*, 2022, https://knowledge4policy.ec.europa.eu/foresight/topic/changing-security-paradigm/developments-and-forecasts-on-changing-security-paradigm_en, accessed 1 November 2022.

79. Morgan, Forrest E. and Raphael S. Cohen, *Military Trends and the Future of Warfare: The Changing Global Environment and Its Implications for the US Air Force*, RAND Corporation, 2020.

80. The Economist, *Why Drones are Becoming Iran's Weapons of Choice*, 13 November 2021, https://www.economist.com/middle-east-and-africa/why-drones-are-becoming-irans-weapons-of-choice/21806199; Yousif, Elias, "Drone Warfare in Ukraine: Understanding the Landscape", *Stimson*, 30 June 2022, https://www.stimson.org/2022/drone-warfare-in-ukraine-understanding-the-landscape/.

81. United Nations, *Rise in mercenary forces trigger 'rampant' human rights violations* [Press release], 20 September 2022, https://news.un.org/en/story/2022/09/1127171; De Groot, Tom and Salvador Santino F. Regilme, Jr., "Private Military and Security Companies and The Militarisation of Humanitarianism", *Journal of Developing Societies*, vol. 38, iss. 1, 25 December 2021.

82. Przetacznik, Jakub and Simona Tarpova, *Briefing: Russia's war on Ukraine: Timeline of cyber-attacks*, European Parliamentary Research Service, June 2022, https://www.europarl.europa.eu/RegData/etudes/BRIE/2022/733549/EPRS_BRI(2022)733549_EN.pdf.

83. Moodie, Michael and Jerry Zhang, "Bolstering Arms Control in a Contested Geopolitical Environment", *Stimson*, 31 October 2022.

Endnotes

84. Robbins, Sam and Chia-Shuo Tang, "How Asia's Digital Governance Beacon Balances Data Privacy and the 'Public Good'", *The Diplomat*, 20 October 2022.

85. The right to privacy is enshrined by Article 12 of the Universal Declaration on Human Rights.

86. Sætra, Henrik Skaug, "Privacy as an aggregate public good", *Technology in Society*, vol. 63, November 2020, https://www.sciencedirect.com/science/article/pii/S0160791X20310381.

87. Organisation for Economic Co-operation and Development (OECD), *Enhancing access to and sharing of data: reconciling risks and benefits for data re-use across societies*, 2020, https://www.oecd-ilibrary.org/sites/15c62f9c-en/index.html?itemId=/content/component/15c62f9c-en.

88. Goujard, Clothilde, "Europe edges closer to a ban on facial recognition", *Politico*, 20 September 2022, https://www.politico.eu/article/europe-edges-closer-to-a-ban-on-facial-recognition/; Heilweil, Rebecca, "Big tech companies back away from selling facial recognition to police. That's progress.", *Vox*, 11 June 2020, https://www.vox.com/recode/2020/6/10/21287194/amazon-microsoft-ibm-facial-recognition-moratorium-police.

89. Information Commissioner's Office, *Employment practices: monitoring at work draft guidance*, 12 October 2022.

90. Sætra, Henrik Skaug, "Privacy as an aggregate public good", *Technology in Society*, vol. 63, November 2020, https://www.sciencedirect.com/science/article/pii/S0160791X20310381.

91. Cohen, Julie E., "What privacy is for", *Harvard Law Review*, 20 May 2013; Taylor, L., L. Floridi and B. Van der Sloot, *Group Privacy: New Challenges of Data Technologies*, Springer, 2016; Taaffe, Ouida, "Will smart cities tilt the balance between data capture and personal privacy?", *Raconteur*, 5 September 2022, https://www.raconteur.net/technology/will-smart-cities-tilt-the-balance-between-data-capture-and-personal-privacy/.

92. European Data Protection Supervisor, *Metaverse*, https://edps.europa.eu/press-publications/publications/techsonar/metaverse_en, accessed 29 November 2022.

93. Rahnama, Hossein and Alex Pentland, "The New Rules of Data Privacy", *Harvard Business Review*, 25 February 2022.

94. Office of the Privacy Commissioner of Canada, *Privacy Tech-Know blog: When what is old is new again – The reality of synthetic data*, 12 October 2022, https://www.priv.gc.ca/en/blog/20221012/?id=7777-6-493564; Platzer, Michael, "AI-based re-Identification attacks – and how to protect against them", *Mostly AI*, 22 April 2022, https://mostly.ai/blog/synthetic-data-protects-from-ai-based-re-identification-attacks/.

95. Rocher, Luc, Julien M. Hendrickx and Yves-Alexandre de Montjoye, "Estimating the success of re-identification in incomplete datasets using generative models", *Nature Communications*, 2019, https://www.nature.com/articles/s41467-019-10933-3.

96. Narayanan, Arvind and Vitaly Shmatikov, "Robust de-anonymization of large sparse datasets", *IEEE*, 28 May 2008, https://ieeexplore.ieee.org/document/4531148.

97. Kolata, Gina, "Poking holes in genetic privacy", *The New York Times*, 16 June 2013, https://www.nytimes.com/2013/06/18/science/poking-holes-in-the-privacy-of-dna.html.

98. Culnane, Chris, Benjamin I. P. Rubinstein and Vanessa Teague, "Health Data in an Open World", *Cornell University*, 15 December 2017, https://arxiv.org/abs/1712.05627.

99. Capotosto, Jill, "The mosaic effect: the revelation risks of combining humanitarian and social protection data", *Humanitarian Law and Policy*, 9 February 2021, https://blogs.icrc.org/law-and-policy/2021/02/09/mosaic-effect-revelation-risks/.

100. NBC News, *Priest outed via Grindr app highlights rampant data tracking*, 22 July 2021, https://www.nbcnews.com/tech/security/priest-outed-grindr-app-highlights-rampant-data-tracking-rcna1493.

101. UNESCO, *The right to privacy in a digital age: UNESCO's inputs for the preparation of the thematic report of the Office of the United Nations High Commissioner for Human Rights*, 2022, https://www.ohchr.org/sites/default/files/documents/issues/digitalage/reportprivindigage2022/submissions/2022-09-06/CFI-RTP-UNESCO.pdf, accessed 3 November 2022.

102. McKenna, Anne Toomey, "Customer Data Can Be Used As Evidence in Government Surveillance", *Marsh McLennan*, 13 November 2022, https://www.brinknews.com/customer-data-can-be-used-as-evidence-in-government-surveillance/.

103. Senate Finance Subcommittee on Fiscal Responsibility and Economic Growth, *Testimony of Samm Sacks: Hearing on Promoting Competition, Growth and Privacy Protection in the Technology Sector*, 7 December 2021; Sherman, Justin, "The Open Data Market and Risks to National Security", *Lawfare*, 3 February 2022, https://www.lawfareblog.com/open-data-market-and-risks-national-security; Cadell, Cate, "China harvests masses of data on western targets, documents show", *The Washington Post*, 31 December 2021 ; Benson, Thor, "The Danger of License Plate Readers in Post-Roe America", *WIRED*, 7 July 2022; Grant, Nico, "Google Says It Will Delete Location Data When Users Visit Abortion Clinics", *The New York Times*,1 July 2022.

104. Collins, Barry, "Mission Impossible: 7 Countries Tell Facebook to Break Encryption", *Forbes*, 11 October 2020.

Endnotes

105. Silic, Anamaria, “Pegasus Spyware Used against Dozens of Activist Women in the Middle East”, *The Intercept*, January 18, 2022. https://theintercept.com/2022/01/18/pegasus-spyware-nso-group-women-activists-journalists/.

106. CIPESA, *State of Internet Freedom in Africa 2022: The Rise of Biometric Surveillance*, September 2022, http://104.152.168.205/~cipesa/old/?wpfb_dl=505.

107. Hoster, Ben, Swati Khurana and Rachel Juay, “Still Buffering: Time for a Smart City Reboot”, *Marsh McLennan*, October 2022, https://www.marshmclennan.com/insights/publications/2022/october/still-buffering-time-for-a-smart-city-reboot.html.

108. Das, Shanti and Vincent Ni, “Fears over China’s access to genetic data of UK citizens”, *The Guardian*, 20 August 2022; Needham, Kirsty and Clare Baldwin, “China’s gene giant harvests data from millions of women”, *Reuters*, 7 July 2021; Mallapaty, Smriti, “China expands control over genetic data used in scientific research”, *Nature*, 6 May 2022.

109. Senate Finance Subcommittee on Fiscal Responsibility and Economic Growth, *Testimony of Samm Sacks: Hearing on Promoting Competition, Growth and Privacy Protection in the Technology Sector*, 7 December 2021; Senate Finance Subcommittee on Fiscal Responsibility and Economic Growth, *Written Testimony of Stacey Gray, Senior Counsel, Future of Privacy Forum*, 7 December 2021.

110. Robbins, Sam and Chia-Shuo Tang, “How Asia’s Digital Governance Beacon Balances Data Privacy and the ‘Public Good’”, *The Diplomat*, 20 October 2022.

111. European Parliament, *Data governance: why is the EU data sharing law important?*, 6 April 2022, https://www.europarl.europa.eu/news/en/headlines/society/20220331STO26411/data-governance-why-is-the-eu-data-sharing-law-important.

112. US White House, *Executive Order on Enhancing Safeguards for United States Signals Intelligence Activities*, 7 October 2022.

113. Organisation for Economic Co-operation and Development (OECD), *Enhancing access to and sharing of data: reconciling risks and benefits for data re-use across societies*, 2019, https://www.oecd-ilibrary.org/sites/15c62f9c-en/index.html?itemId=/content/component/15c62f9c-en; Office of the Privacy Commissioner of Canada, *Privacy Tech-Know blog: Privacy Enhancing Technologies for Businesses*, 12 April 2021, https://www.priv.gc.ca/en/blog/20210412/; Stadler, Theresa, Bristea Oprisanu and Carmela Troncoso, *Synthetic Data – Anonymisation Groundhog Day, Cornell University*, 24 January 2022, https://arxiv.org/abs/2011.07018; Sei, Yuichi, Hiroshi Okumura and Akihiko Ohsuga, “Re-identification in differentially private incomplete datasets”, *IEEE Open Journal of the Computer Society*, vol. 3, 20 May 2022, https://ieeexplore.ieee.org/document/9779455.

114. Fayans, Iliya, et al., “Cyber security threats in the microbial genomics era: implications for public health”, *Eurosurvellance*, vol. 25, no. 6, 2020; Vinatzer, Boris A., et al., “Cyberbiosecurity Challenges of Pathogen Genome Databases”, *Frontiers in Bioengineering and Biotechnology*, vol. 7, 15 May 2019; Arshad, S., et al., “Analysis of security and privacy challenges for DNA-genomics applications and databases”, *Journal of Biomedical Informatics*, July 2021.

115. Saglam, Rahime Belene, Jason R.C. Nurse and Duncan Hodges, “Personal information: Perceptions, types and evolution”, *Journal of Information Security and Applications*, vol. 66, May 2022.

116. Information Commissioner’s Office, *Catalogue retailer Easylife fines £1.48 million for breaking data protection and electronic marketing laws*, 6 October 2022, https://ico.org.uk/about-the-ico/media-centre/news-and-blogs/2022/10/catalogue-retailer-easylife-fined-148-million/.

117. Marsh and Microsoft, “The State of Cyber Resilience 2022”, 2022, https://www.marsh.com/us/services/cyber-risk/insights/the-state-of-cyber-resilience.html.

118. Roubini, Nouriel, “We’re Heading for a Stagflationary Crisis Unlike Anything We’ve Ever Seen”, *TIME*, 13 October 2022, https://time.com/6221771/stagflation-crisis-debt-nouriel-roubini/.

119. International Monetary Fund, *General government gross debt: percent of GDP*, https://www.imf.org/external/datamapper/GGXWDG_NGDP@WEO/OEMDC/ADVEC/WEOWORLD, accessed 11 December 2022.

120. The World Bank. 2022. *Risk of Global Recession in 2023 Rises Amid Simultaneous Rate Hikes*. 15 September 2022. https://www.worldbank.org/en/news/press-release/2022/09/15/risk-of-global-recession-in-2023-rises-amid-simultaneous-rate-hikes

121. Ibid.

122. Pazarbasioglu, Ceyla and Carmen Reinhart, “Shining a light on debt”, *International Monetary Fund (IMF)*. March 2022. https://www.imf.org/en/Publications/fandd/issues/2022/03/Shining-a-light-on-debt-Pazarbasioglu-Reinhart.

123. Subran, Ludovic, “Reverse Currency War Is Hitting Emerging Markets Hard”, *South China Morning Post*, October 20, 2022, https://www.scmp.com/comment/opinion/article/3196468/federal-reserves-inflation-fight-leaves-emerging-markets-scrambling-answers.

124. Allianz, “Reverse currency war puts emerging markets at risk”, 29 September 2022, https://www.allianz-trade.com/en_global/news-insights/economic-insights/emerging-markets-debt-sustainability-risks.html.

Endnotes

125. Adrian, Tobias and Gaspar, Vitor. 2022. "How Fiscal Restraint Can Help Fight Inflation". *IMF blog*. 21 November 2022.

126. Government of the United Kingdom Office for National Statistics, *Public sector finances*, UK: October 2022, 22 November 2022, https://www.ons.gov.uk/economy/governmentpublicsectorandtaxes/publicsectorfinance/bulletins/publicsectorfinances/october2022; Government of the United Kingdom Office for National Statistics, *Public sector finances, UK: March 2022*, 26 April 2022, https://www.ons.gov.uk/economy/governmentpublicsectorandtaxes/publicsectorfinance/bulletins/publicsectorfinances/march2022.

127. Bank of England, *Why have interest rates gone up?*, 4 November 2022, https://www.bankofengland.co.uk/knowledgebank/why-are-interest-rates-in-the-uk-going-up#:~:text=On%203%20November%202022%2C%20we,loan%2C%20mortgage%20or%20savings%20account.

128. Carlsson-Szlezak, Philipp and Paul Swartz, "Why the market vetoed the UK's budget – and what it means for the changing nature of stimulus around the world", *Fortune*, 27 September 2022, https://fortune.com/2022/09/27/market-vetoed-uk-budget-truss-pound-changing-nature-stimulus-economy-carlsson-szlezak-swartz/.

129. Georgieva, Kristalina and Ceyla Pazarbasioglu, "The G20 Common Framework for Debt Treatments Must Be Stepped Up", *IMF blog*, 2 December 2021, https://www.imf.org/en/Blogs/Articles/2021/12/02/blog120221the-g20-common-framework-for-debt-treatments-must-be-stepped-up.

130. Jensen, Lars, *Avoiding 'Too Little Too Late' on International Debt Relief*, United Nations Development Programme (UNDP), UNDP Development Futures Series Working Papers, 11 October 2022, https://www.undp.org/publications/dfs-avoiding-too-little-too-late-international-debt-relief.

131. Ibid.

132. Ibid.

133. Sharma, Ruchir, "A post-dollar world is coming*", Financial Times*, 28 August 2022, https://www.ft.com/content/989b2e50-e8b5-474c-86a3-190c6881b235?desktop=true&segmentId=7c8f09b9-9b61-4fbb-9430-9208a9e233c8#myft:notification:daily-email:content.

134. The World Bank, *International Debt Statistics*, https://databank.worldbank.org/source/international-debt-statistics, accessed 13 December 2022.

135. World Bank Group, *World Development Report 2022: Finance for an Equitable Recovery*, 2022, https://www.worldbank.org/en/publication/wdr2022.

136. Ibid.

137. Wolf, Martin, "Delay only makes climate action more urgent", *Financial Times*, 8 November 2022, https://www.ft.com/content/5198e3ba-997f-4db5-8310-3a68ae91d9f2?emailId=153c65f9-db1b-495c-8385-7912d487ef5c&segmentId=22011ee7-896a-8c4c-22a0-7603348b7f22.

138. World Bank Group, *World Development Report 2022: Finance for an Equitable Recovery*, 2022, https://www.worldbank.org/en/publication/wdr2022.

139. The World Bank, *Two-Thirds of Poorer Countries are Cutting Education Budgets Due to COVID-19* [Press release], 22 February 2021, https://www.worldbank.org/en/news/press-release/2021/02/22/two-thirds-of-poorer-countries-are-cutting-education-budgets-due-to-covid-19; The World Bank, *Financing for Education Stagnant or Declining Despite Chronic Learning Needs Post-COVID-19* [Press release], 28 June 2022, https://www.worldbank.org/en/news/press-release/2022/06/28/financing-for-education-stagnant-or-declining-despite-chronic-learning-needs-post-covid-19.

140. Lee, Nancy, "Restructuring Sovereign Debt to Private Creditors in Poor Countries: What's Broken?", *Center for Global Development*, 5 August 2020, https://www.cgdev.org/publication/restructuring-sovereign-debt-private-creditors-poor-countries-whats-broken.

141. Jensen, Lars, *Avoiding 'Too Little Too Late' on International Debt Relief*, United Nations Development Programme (UNDP), UNDP Development Futures Series Working Papers, 11 October 2022, https://www.undp.org/publications/dfs-avoiding-too-little-too-late-international-debt-relief.

142. World Bank Group, *World Development Report 2022: Finance for an Equitable Recovery*, 2022, https://www.worldbank.org/en/publication/wdr2022.

143. Chamon, Marcos, Erik Klok, Vimal Thakoor and Jeromin Zettelmeyer, *Debt-for-Climate Swaps: Analysis, Design, and Implementation*, International Monetary Fund (IMF), IMF Working Papers, 12 August 2022, https://www.imf.org/en/Publications/WP/Issues/2022/08/11/Debt-for-Climate-Swaps-Analysis-Design-and-Implementation-522184.

144. Pilling, David, Joseph Cotterill and Camilla Hodgson, "South Africa warns $8.5bn climate package risks fuelling debt burden", *Financial Times*, 4 November 2022, https://www.ft.com/content/e6653b1d-2302-4e44-81bb-38dc608d303d?desktop=true&segmentId=7c8f09b9-9b61-4fbb-9430-9208a9e233c8#myft:notification:daily-email:content.

145. Wolf, Martin, "Delay only makes climate action more urgent", *Financial Times*, 8 November 2022, https://www.ft.com/content/5198e3ba-997f-4db5-8310-3a68ae91d9f2?emailId=153c65f9-db1b-495c-8385-7912d487ef5c&segmentId=22011ee7-896a-8c4c-22a0-7603348b7f22.

3

Resource Rivalries: Four Emerging Futures

3.1 Anticipating "polycrises"

Chapter one and Chapter two highlighted newly emerging and rapidly accelerating risks over the current, two- and 10-year time frame to provide analysis on risks currently unfolding or those that may become the next global shock. However, these present and future risks can also interact with each other to form a "polycrisis" – a cluster of related global risks with compounding effects, such that the overall impact exceeds the sum of each part.[1]

Scenario thinking can be a useful tool to enable better anticipation of polycrises, as key drivers can interact in unanticipated ways and lead to unexpected consequences. Bearing this in mind, this chapter explores how connections between the emerging risks outlined in previous sections may evolve by 2030. This year, we explore **Resource Rivalries** - a potential cluster of interrelated environmental, geopolitical and socioeconomic risks relating to the supply of and demand for natural resources. The intent is not to exhaustively outline all scenarios but to provide a structured approach to identifying potential futures for the polycrisis that may be triggered, providing a framework for better preparedness and risk mitigation efforts today.

3.2 Polycrisis: natural resources, climate and cooperation

A growing demand-supply gap for natural resources

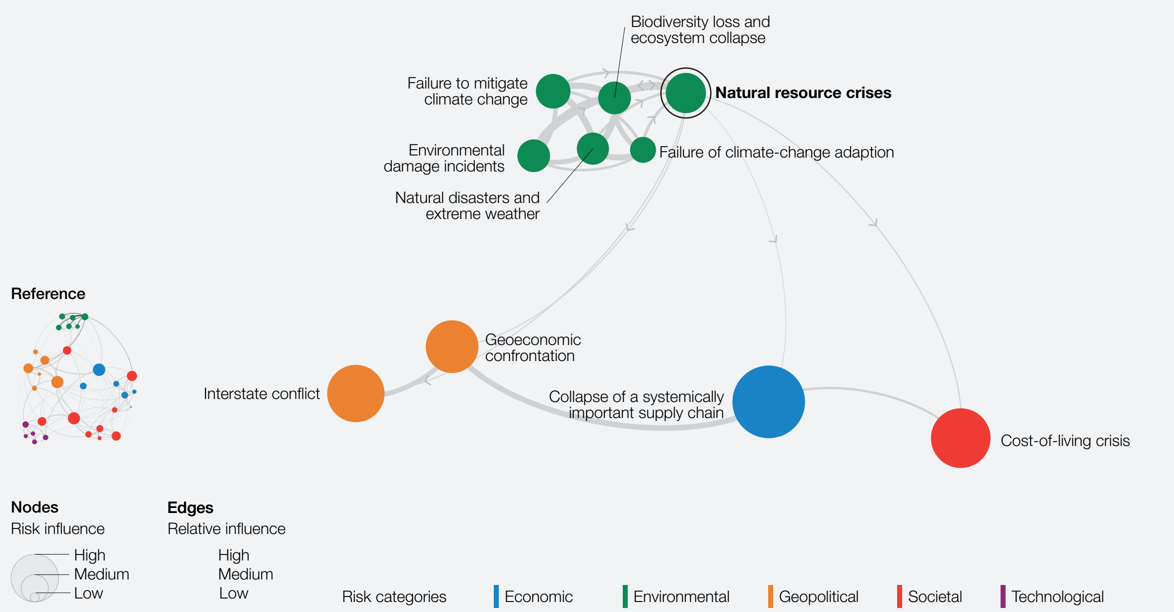
Supply-chain crises of recent years have highlighted the need for resilience in traditional strategic sectors. Reliable and cheap access to the most basic of necessities – food, water and energy – underpins the critical functioning of societies. Early data suggests that current crises are driving a worrying reversal of recent progress. An additional 200 million people faced acute food insecurity last year compared to 2019, and the number of people worldwide without electricity rose to an estimated 774 million, the equivalent of pre-pandemic levels.[2] As noted in Chapter 1.2, Cost-of-living crisis, supply crises of this nature can be highly destabilizing, exposing the fragility of states and leading to loss of life, widespread violence, political upheaval and involuntary migration.

Demand for food, water and critical metals and minerals is escalating. This reflects a range of factors, including continued population growth, anticipated to reach 8.5 billion by 2030,[3] and socioeconomic advancement, with a push to achieve the UN's Sustainable Development Goals (SDGs) by the target date of 2030. Global food consumption is projected to increase by 1.4% annually over the next decade, concentrated in low- to middle-income countries, versus a 1.1% per annum increase in production.[4] One estimate places the gap between water demand and supply at 40% by 2030, with a dramatic and unequal increase in demand between countries.[5] The continued expansion into secure, renewable energy and related infrastructure will also drive exponential demand for finite critical metals and minerals.[6] Significant even in absolute terms, annual demand for these resources, such as graphite, lithium and cobalt, is anticipated to hit 450% of 2018 production levels by 2050.[7]

Together, the set of emerging demand and supply concerns around natural resources are already becoming an area of growing alarm. GRPS respondents identified strong relationships and two-way linkages between **"Natural resource crises"** and the other risks identified in previous chapters (Figure 3.1), pointing to the potential polycrisis that may evolve over the medium term.

FIGURE 3.1

Natural resource polycrisis



Source

World Economic Forum, Global Risks Perception Survey 2022-2023.

Cooperation and climate as key forces for disruption

In the 2030 time frame, two critical factors will determine the trajectory of our ability to match supply and demand for these resources as well as the scale of the associated polycrisis: 1) the degree of global cooperation that allows the flow of resources across national borders, and 2) the impact of climate change on the supply of natural resources and speed of the low-carbon transition (Box 3.1).

Together, these two axes lead to four hypothetical futures for 2030:

- **Resource collaboration – the danger of natural scarcity:** effective climate action measures and flexible supply chains enabled by global cooperation largely absorb the impacts of climate change on food production. However, shortages in water and metals and minerals cannot be avoided. Persistently high commodity prices slow climate mitigation – despite ambitions – and add to inflationary pressures in broader value chains, while water stress leads to a growing, but comparatively contained, health and humanitarian crisis in developing nations.

- **Resource constraints – the danger of divergent distress:** current crises draw focus and slow climate action, exposing the most vulnerable countries to hunger and energy shocks, even as countries cooperate to partially address constraints. In the absence of intervention, the water and mineral shortages experienced in the **Resource collaboration** scenario act as a multiplier to broader risks. A multi-resource, humanitarian crisis emerges in developing markets as food and water resources are impacted by the physical consequences of climate change, alongside global disruptions to trade, political stability and economic growth.

- **Resource competition – the danger of resource autarkies:** distrust drives a push for self-sufficiency in high-income countries, limiting the need for rivalry over food and water to a degree, but widening divides between countries. State intervention is centred on the resource most exposed to a concentration in supply – critical metals and minerals – leading to shortages, price wars and the transformation of business models across industries. Resource power shifts, driving the formation of new blocs as well as wedges in existing alliances between mineral-rich and -poor countries, while the potential for accidental or intentional conflict escalates.

- **Resource control – the danger of resource wars:** alongside the weaponization of metals and minerals explored in **Resource competition**, geopolitical dynamics exacerbate climate-induced shortages in food and water. This results in a truly global, multi-resource crisis, with widespread socioeconomic impacts that exceed those faced in other futures in both scope and scale, including famine and water scarcity refugees. Geoeconomic warfare is widespread, but more aggressive clashes between states become one of the few means to ensure supply of basic necessities for populations.

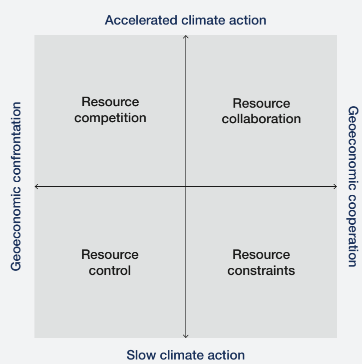
Given the nature of the polycrisis in each scenario, we face various environmental and socioeconomic upsides and downsides. The following section outlines an illustrative, but non-exhaustive set of mid-term futures to help support business leaders and policy-makers in preparing for – and preventing – the progression of the crises we are facing today.

BOX 1

Futures framework

FIGURE 3.2

Natural resource polycrisis: futures framework



Source
Global Risks Report 2023.

We use two global drivers – geoeconomic confrontation and speed of climate action – to create four futures we may face by 2030, considering potential implications based on the evolution of these risks and their interactions (Figure 3.2).

First, we explore the potential risks of a failure of climate-change adaptation and failure of climate mitigation efforts, described in Chapter 1.2, Climate action hiatus, and the extent to which these failures could result in conditions of scarcity, on a continuum (y-axis):

- **Accelerated climate action:** climate action and associated funding and innovation are prioritized. By 2030, we see persistently expanding but largely well-managed impacts of climate change, nature loss, natural disasters and extreme weather events at a global level, alongside a more rapid energy transition and other climate mitigation efforts as well as more rapid adaptation.

- **Slow climate action:** trade-offs between environmental, social and security goals slow the prioritization of attention and resources to address climate change. By 2030, there has been insufficient or ineffective progress towards the adaptation support required to protect infrastructure and populations from changing climactic conditions. Paired with relatively slow efforts at mitigation, this has resulted in continued damage to natural ecosystems and an increasing financial and humanitarian impact.

In parallel, the intensity of the demand-supply gap in natural resources will reflect the mechanisms by which states look to boost security in key resources. We consider the extent to which the evolution of **Geoeconomic confrontation**, highlighted in Chapter 1.2, Economic warfare, could create conditions of scarcity, by considering two ends of a continuum (x-axis):

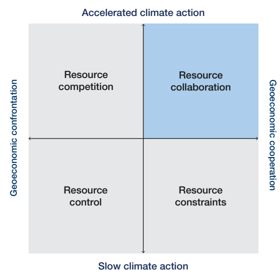
- **Geoeconomic cooperation:** characterized by open dialogue and broadscale, but not always successful, economic and trade collaboration between powers through relevant bilateral and multilateral mechanisms and forums. Well-established principles governing trade policies and state aid are respected.

- **Geoeconomic confrontation:** direct and indirect clashes between global and regional powers through the extensive exercise of hard or soft economic, industrial and technological power. There is limited collaboration on global economic and trade issues and a breakdown or paralysis of mechanisms of cooperation, as well as alliances.

3.3

Four futures for 2030

Resource collaboration – the danger of natural scarcity



By 2030, the world is subject to more widespread and dramatic climate impacts – but we are prepared. Capital, intellectual property and technological innovations flow relatively freely across borders (x-axis). Multilateral and market-led initiatives have unlocked a range of financing mechanisms and innovation to support climate-proofing against future disasters and a rapid shift to climate mitigation efforts (y-axis). In response to public pressure, governments have broadly prioritized spending towards adaptation – and in some cases mitigation – alongside other social and security concerns, dampening the impact of climate change on societal vulnerabilities. In this future, the scaling of food has been supported by international flows of financing and technology, and shortages muted by flexible supply chains. Downside impacts are primarily focused on resources that face barriers to trading or scaling: water and critical minerals.

Climate-driven declines in agricultural productivity have been met with a range of measures in most countries, with climate and nature-based interventions helping to transform food systems to be regenerative, climate-smart and healthy. Global sharing of data and technologies has allowed more effective pre-emptive adaptation measures to be taken, such as the targeted use of flood- and drought-resilient seeds in some vulnerable geographies. Although environmental degradation continues to threaten aquaculture and fisheries, targeted nature-based adaptation measures have shored up domestic food networks (see **Chapter 2.2: Natural Ecosystems**).

The allocation of risk has begun to shift away from vulnerable workforces and communities. The burden of continued weather shocks has been partially offset through adaptation actions, financed by fit-for-purpose financial products, including weather-based index insurance, climate-related loan products, guaranteed credit lines, and well-managed risk-based exits from extreme-event-prone geographies.[8] Supply shocks stemming from natural disasters are quickly absorbed by flexible, market-driven supply chains, and global food insecurity continues to slowly trend downwards.

Risks remain: some natural resources are scarce, even in a climate-adapted, geopolitically cooperative world. Demand for geographically concentrated critical metals and minerals has risen dramatically, reflecting a push for secure, renewable energy sources in the wake of the war in Ukraine, and renewed urgency of net-zero ambitions over recent years. Despite sufficient resource deposits in most minerals,[9] this exponential increase in demand has proved difficult to meet through a rapid expansion of supply. Shortages initially stemmed from limited exploration and significant capital requirements, but the rise in commodity prices have subsequently helped to scale production, with companies now targeting deposits previously deemed unextractable for economic or technological reasons.

However, shortages in key materials remain a near- and mid-term concern, given time lags to production. Further, environmental concerns have limited domestic extraction in several advanced and some emerging economies, as well as by multinational mining companies headquartered in the West. Scrutiny from investors, downstream industries and the public have led to longer approval processes and more stringent environmental and social standards. For example, since the early 2020s, the expansion of lithium mining in Portugal has been significantly delayed due to environmental approvals; projects in Canada and Australia have slowed based on concerns relating to indigenous communities; and a rare species of buckwheat has limited domestic mining in key locations in the United States of America.[10]

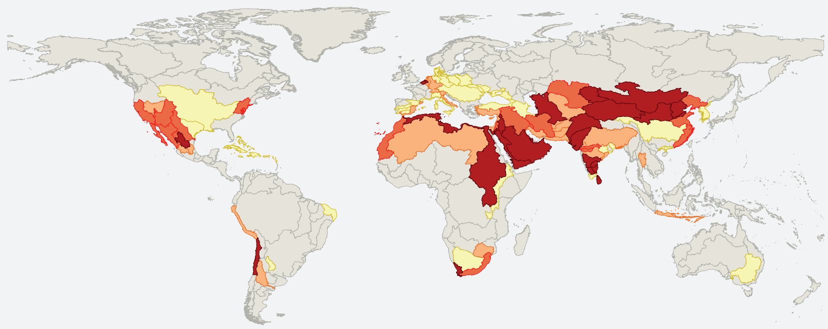
Higher commodity prices have driven inflationary impacts along the wider value chain, explored further (and felt more acutely) in the section on **Resource competition**. This has encouraged some countries and multinational companies to accelerate efforts to turn towards the circular economy as a means of securing and diversifying the supply of critical minerals and metals, reducing the need for extraction and associated emissions. Industry coalitions are working with future-focused governments to establish the incentives, policy frameworks, standards and certifications, and circularity-focused capabilities that are necessary to scale.[11] In some markets, business models are being transformed to decrease demand and increase both the recovery potential and actual recovery of metals and minerals, partially mitigating the demand-supply gap going forward.

Despite these efforts and continued climate ambitions, higher prices and shortages are slowing momentum for the green energy transition in the short-term. In lower-income economies without local minerals and metals assets, the promise of support with green energy infrastructure is partly unfulfilled, and some are considering reverting to carbon-intensive energy sources to secure energy.[12]

The ability to scale water supply has similarly been

FIGURE 3.3

Level of water stress by major river basin, 2018



Water stress

No stress (0-25%) | Low (25-50%) | Medium (50-75%) | High (75-100%) | Critical (>100%)

Source

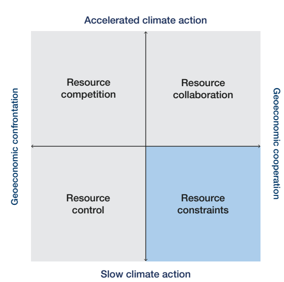
FAO, Aquastat database, 2022.[13]

Note

Level of water stress (SDG 6.4.2) by major river basin (reference year 2018). It is calculated as the ratio between (a) the amount of total freshwater resources withdrawn in the three economic sectors (Agriculture, Service and Industry) and (b) the total renewable freshwater resources after detracting the amount of water needed to support existing environmental services.

constrained. Water monitoring, efficiency and production measures have been prioritized by cities, local and national governments to address more frequent and severe droughts and the growing water footprint of food production. Water remains heavily subsidized, but pricing is used to curb demand and encourage investment by the private sector and households in water-efficient, re-usable solutions, including rainwater harvesting and stormwater runoffs. Some countries have limited the use of price controls to industrial use, while others apply them more broadly across populations, further fueling inflation, cost-of-living pressures and unrest. But even significant drops in water demand and waste have not kept pace with the impact of climate change on water resources in the most exposed regions (Figure 3.3). The capacity to scale supply through mechanisms such as desalinization and purification differ between countries for geographical and economic reasons. Water security continues to be threatened in some of these countries, with growing regional impacts from hygiene and health crises, urban migration, internal displacement and involuntary migration.

Resource constraints – the danger of divergent distress



Despite strong headwinds in the early 2020s, geoeconomic cooperation resumes in the latter half of the decade, with stronger global trade as well as efforts on climate cooperation (x-axis), mirroring **Resource collaboration**. However, domestic funding – and therefore overall investment – in adaptation measures as well as technological innovation has not kept pace with climate impacts to date (y-axis), given competing priorities, a growing insurance gap and continued costs of disaster recovery. In this future, even international coordination cannot address triple-shortages in food, water and energy in the most vulnerable nations, with extended climate-induced distress and disruptions to trade, and political and economic stability.

In the absence of appropriate intervention, water availability is now a concern in all regions. Snowmelt, glacial melt and groundwater availability has diminished, while 10% of global land area has experienced an increase in extremely high and low river flows in the same location. Continued geopolitical cooperation is evident through widespread engagement in the range of multilateral mechanisms governing these resources, from the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention) and the 1997 Convention on the Law of the Non-navigational Uses of International Watercourses (Watercourses Convention), to bilateral and regional agreements.

However, water stress acts as a multiplier to shortages of other key resources. In the absence of effective adaptation, agricultural productivity is severely impacted by climate change, diverging in intensity between regions. Crop yields have fallen in volume and nutritional value due to heat, changing

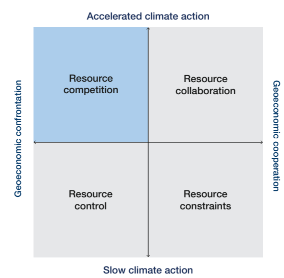
weather patterns, dry and wet precipitation extremes, and shifts to the distribution of insects, pests and diseases.[14] Agricultural output in the United States of America has declined overall due to decreased production of rice, corn, soy and wheat.[15] Russian agricultural yields have fallen in the country's most productive southern regions and have not been fully balanced by the expansion of arable land in the country's north, where soils remain less productive.[16] Climate change has reduced rice, wheat and corn yields by 8% in China.[17] Without focused conservation and restoration efforts, ocean warming and acidification has caused broadscale declines in aquaculture and fisheries, threatening not only food security but also livelihoods in some of the most climate-exposed countries.

High-latitude, high-income and high-tech countries are comparatively less impacted, either due to contained climate impacts for now, or leveraging of rapid innovation to address food and water security challenges.[18] Free-flowing global supply chains have helped distribute the overall hit to food production levels, but the most resource-insecure countries are those vulnerable to two prolonged crises: debt and climate change. Given the extended capital flight earlier in the decade, and without the fiscal space to speed up adaptation measures (see Chapter 1.2, Economic downturn), these countries have become even more heavily import-dependent, unable to scale food production to meet the demands of population growth, given water stress and deteriorated soil conditions.

Green-energy supply is also at risk. Companies mining critical metals and minerals in water-stressed regions face regular interruptions to operations or closures, or are forced to invest in water sources that do not directly compete with human consumption, partially exacerbating shortages, as described in **Resource collaboration**. This elevates commodity prices further, slowing the roll-out of green energy infrastructure. In parallel, the frequency and severity of heatwaves and droughts has forced green energy sources – biofuels, hydropower and nuclear – into periodic production cuts, and some are on the verge of becoming stranded assets. Electrical supply has been destabilized in the near-term for many countries, including Brazil, South Africa, China, Germany and the United States of America, increasingly turning these markets towards alternate energy sources.

Even in the absence of geopolitically fuelled shocks or constraints, continued price pressures on food, water and energy have resulted in an elongated cost-of-living crisis in selected markets, ushering in wage strikes, violent protests and state instability. Socioeconomic impacts have also begun to spread to more advanced economies, with a risk of partial deindustrialization caused by combined energy-water shortages. The shutdown of waterborne transport of trade is more regularly disrupting global supply chains, placing pressure on road and rail transports and dampening global economic growth.[19] Energy- and water-intensive strategic industries, such as semiconductor manufacturing, located in resource-insecure areas, have become new geopolitical hotspots, raising the risk of prolonged disputes and possible conflicts.

Resource competition – the danger of resource autarkies



In this future, there is accelerated climate action by 2030 (y-axis) but global powers are aiming for self-sufficiency in key resources, leaving many emerging and developing countries comparatively exposed. Heightened geopolitical confrontation is focused in the most geographically concentrated resource: metals and minerals (x-axis).

In anticipation of a deteriorating geopolitical environment, self-sufficiency in sources of food production has been scaled up in countries that can afford it, alongside a focus on adaptation, as considered in **Resource collaboration**. Food productivity has been enhanced, in part via technology, such as gene editing of crops, even in the absence of extensive multilateral cooperation on such technology. A sharper focus on productivity of existing farmlands, dietary shifts and reductions in food loss and waste are being utilized as levers. Efficiency in agricultural practices, land-use and food systems have allowed some countries to decouple food security and biodiversity trends, partially addressing the estimated 33% of global food production previously wasted through unsustainable production and consumption.

While this has led to enhanced food production

FIGURE 3.4 | **Relevance of critical metals and minerals**

Indicative supply chains: key producers and consumers

Oil and gas	Upstream			Refining/minstream			Consumption		
Oil	US	Saudi Arabia	Russia	US	China	Russia	US	China	India
Natural Gas	US	Russia	Iran	Russia	Qatar	Australia	US	Russia	China

Clean technologies	Mining		Processing		Battery material			Battery cell/pack			Electric vehicle deployment		
Copper	Chile	Peru	China	Chile	China	Korea	Japan	China	US	Korea	China	US	EU

	Mining		Processing		Polysilicon			Solar panel			Photovoltaic system installation		
Lithium	Australia	Chile	China	Chile	China	Korea	Germany	China	Korea	Canada	China	EU	US
Nickel	Indonesia		China	Indonesia	China	Korea	Germany	China	Korea	Canada	China	EU	US

	Mining	Processing	Wind turbine & components					Wind installation		
Cobalt	DRC	China	China	India	US	Spain	Germany	China	EU	US
Rare earths	China	China	China	India	US	Spain	Germany	China	EU	

Source

Leruth, et al. 2022.[20]

Note

Largest producers and consumers are indicative only.

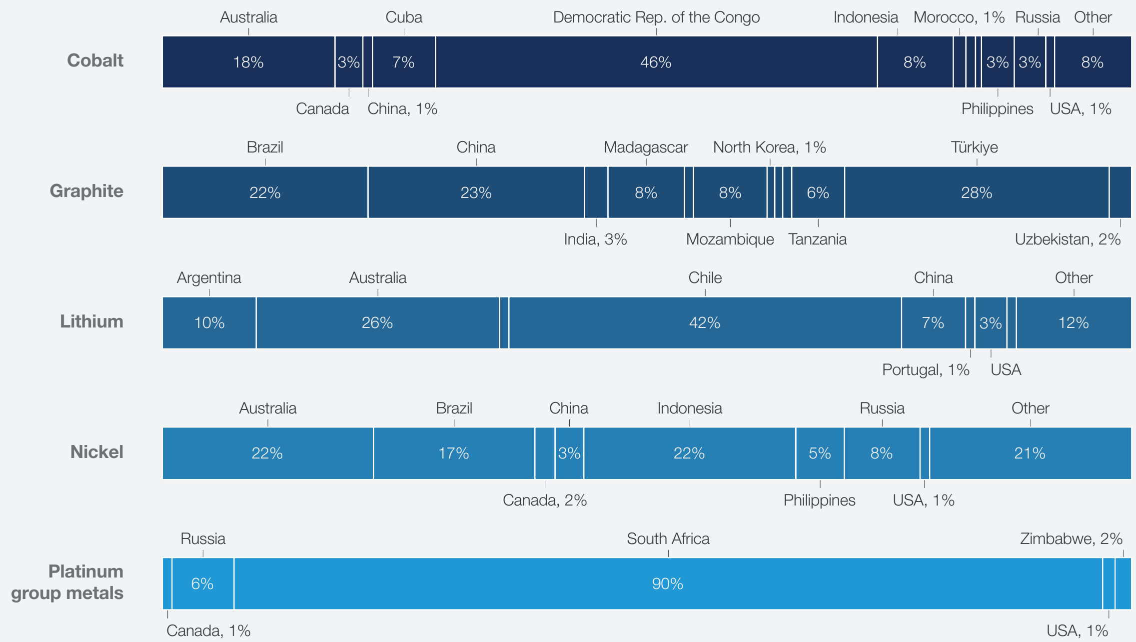
overall in many advanced economies, the benefits have not been widely shared, with significant divergence in the level of food security between countries. Even as some global trade in protein has continued, shortages and higher prices have hit lower socioeconomic groups, and developing and emerging countries the hardest, particularly those least able to scale food production in the absence of international support. This includes parts of Africa, Central and South America, Small Island Developing States (SIDS) and South Asia, where many economies have faced nearly decade-long triple crises: debt, population growth and climate change. Global poverty, climate-sensitive livelihood crises, malnutrition and diet-related diseases, state instability and involuntary migration have all risen, elongating and spreading the instability and humanitarian crises described in **Chapter 1.2, Cost-of-living crisis**.

Critical metals and minerals are a key area of geopolitical confrontation due to their geographic concentration. These resources are not only essential to renewable energy capture, storage and efficiency, but also continue to be leveraged for a wide range of other industrial applications, including technological and military end-uses (Figure 3.4).[21] Indium is part of touch screens as well as solar panels; lithium compounds are utilized by the pharmaceutical industry; cobalt has multiple aerospace applications but is also of increasing interest as a catalyst for green hydrogen production; and vanadium is used as an input for industrial-scale batteries as well as a steel alloy in nuclear reactors, space vehicles and aircraft carriers. The resulting demand-supply gap described in **Resource collaboration** is exacerbated in this future because of geopolitical rivalries, exposing the brittleness of global supply chains with limited opportunities for geographic diversification. For example, in the early half of the 2020s, the United States was 100% net import-reliant for 14 critical minerals, including gallium, natural graphite, indium and vanadium.[22] At the time, China was the leading producer for 16 of the 32 strategic minerals, including the aforementioned resources, representing 98%, 82%, 58% and 66%, respectively, of the world's total production.[23]

With a trend towards remilitarization (see **Chapter 2.4: Human security**), these strategic resources have become one of the primary fronts of economic warfare over the latter half of the decade. Despite competing fiscal priorities, more states have sought to diversify supply through domestic extraction where available, although many face environmental constraints outlined in **Resource collaboration**. Enhanced capacity in processing and refining has been targeted in particular by states with limited resource reserves (Figure 3.5). Resilience, particularly for import-reliant markets, has partially translated into redundancies, with the building of stockpiles of key materials exacerbating supply crises. Inbound investment screening – which only advanced economies have been able to afford the opportunity cost – has been expanded to mining and related industries to minimize foreign interference. Other countries have followed the lead of Canada, ordering certain foreign companies to unwind investments in mining due to the perceived threats to national security.[24] With limited options, outbound investment screening is now being contemplated by import-reliant markets as a potential lever, although most major powers continue to leverage increasingly state-directed investment in emerging export markets across Latin America and Africa as a means of securing access to these resources.

FIGURE 3.5

Reserves of critical metals and minerals



Source

IEA, World Energy Outlook Special Report: The Role of Critical Minerals in Clean Energy Transitions, 2022, US Geological Study, Mineral Commodity Summaries (various), 2022.[25]

Note

References to 1% refer to ≤1%.

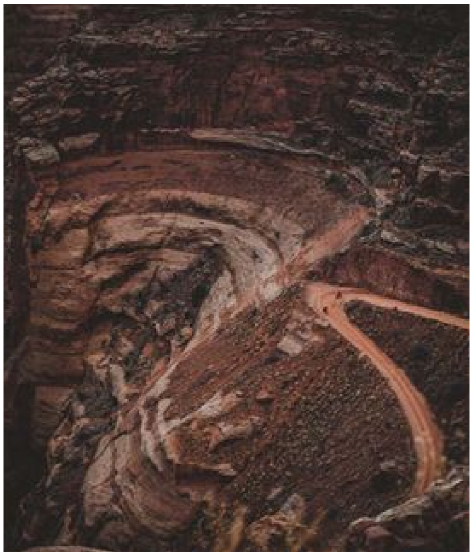
The importance and influence of allied blocs have grown, with countries building and favouring domestic and "trusted" supply chains in their search for resource security. The geographic distribution of numerous metals and minerals has ensured a degree of mutual interdependence. For example, Brazil has scaled lithium, rare earth elements and nickel production, but has remained dependent on others for refining and on neighbours for other resources such as copper and cobalt.[26] The EU and Canada have continued their Strategic Partnership on Raw Materials, extending the scope of the agreement beyond the development and financing of critical mineral projects to increased collaboration on related technologies.[27]

Yet resource nationalism has also driven cracks in existing alliances – becoming the next *Airbus vs. Boeing* – with disputes arising first around the application of state aid to boost domestic mining and processing industries. The expanding use of the national security exemption at the WTO has also increasingly paralysed multilateral trade mechanisms, rendering them ineffective in addressing geopolitical confrontation in a world where local resilience and security is prioritized over comparative advantage and efficiency. Bilateral mechanisms are elevated in importance as the primary vehicle for disputes.

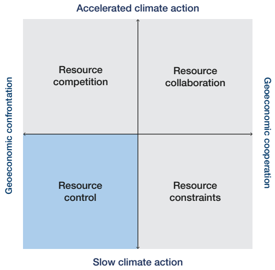
Shortages artificially inflated by geoeconomic rivalries and price volatility, including of related products such as batteries and semiconductors, have reverberated throughout the supply chains of multiple industries. Shorter supply chains reflecting geopolitical alliances have ensued. State intervention has become more common and stringent, with government planning directly and indirectly allocating available resources for prioritised industries; some followed Mexico's suit by renationalizing assets associated with key metals and minerals.[28] Multiple "civilian" sectors have been forced to adapt to greater cross-industry competition. For example, Tesla built a lithium refinery in the United States of America,[29] and an uptick in offtake agreements have quickly spiralled into direct investments and more vertical integration, creating fresh challenges for competitiveness regulations.

A number of developing and emerging markets have become net beneficiaries of this heightened interest of both the public and private sector, including Indonesia, Morocco and the lithium triangle of Plurinational State of Bolivia, Argentina and Chile. However, these countries have had to walk a tightrope as global powers exert control through trade, investment and technological ties and seek to constrain access by rival states. Alongside enhanced nationalization, this has led to the relatively recent creation of OMEC: an organization of mineral exporting countries, similar to OPEC.[30] While the resource boom has offered a path to growth for some of these countries, for others the focus on these assets has created a "Dutch Disease" phenomenon, or led to increased corruption, inequality, violence and humanitarian crises.[31]

Further, illicit activities and the risk of accidental or intentional escalation into hot warfare over resources has risen, particularly in the border zones and global commons. Export constraints on minerals have placed upwards pressure on broader international governance and enforcement mechanisms that oversee new exploration zones – including those relating to mining in international waters, polar regions and in space. As the hunt for new mineral sources turns to the ocean, national marine jurisdictions are increasingly contentious, with a growing proportion of territory under dispute.[32]



Resource control – the danger of resource wars



By 2030, investment in adaptation measures has not kept pace with climate impacts to date (y-axis). At the same time, geopolitical dynamics have turned the natural resource crisis from one of affordability to one of availability (x-axis), creating a cascading economic, environmental and humanitarian crisis in all but a handful of select countries – but even these remain exposed through cross-border effects. In this future, the resulting socioeconomic fall-out exceeds the scope and scale of all other futures, and state intervention turns even more aggressive, expanding beyond economic confrontation to secure supply of necessities for populations.

Building on **Resource constraints**, both affordability and availability concerns are widening inequality. Reflecting **Resource competition**, self-sufficient sources of food production have been scaled up, but with limited sharing of innovation and financing, the tipping point of overall productivity growth in agriculture has already passed. Without effective policy, financing and technological support for adaptation practices, lower socioeconomic communities and countries have resorted to changes in crop choice and large shifts in land-use patterns to maintain current production growth.[33] Agriculture has become an even larger driver of global emissions. Land-clearance for crops and grazing have led to deforestation, and an increase in livestock has resulted in even more emissions, including the very potent methane. Intensive and inefficient farming has exacerbated soil degradation, water stress, pollution and the decline in production capacity. This has created broader domestic trade-offs, particularly with sectors directly dependent on biological resources, with knock-on impacts for economic growth and productivity and the speed of the green transition. Arable land has been increasingly prioritized for agriculture, shifting away from biofuels and green energy infrastructure.

Similar to **Resource constraints**, water stress is now widespread. In developing countries, this particularly impacts women and girls responsible for water collection, with knock-on impacts for health and education outcomes. More widespread scarcity, combined with paralysis of international cooperation mechanisms, has necessitated a degree of water nationalism, resulting in prolonged disputes between neighbouring countries.[34] In the face of spreading humanitarian crises and state instability, water infrastructure continues to be used both as a weapon and target, mirroring past water conflicts and terrorism in India, Pakistan and Afghanistan.[35] In addition, there is less visible abuse and depletion of shared "non-renewable" groundwater reserves, such as in Saharan Africa and the Middle East, raising the risk of conflict.[36]

Conditions of scarcity initially consolidated the influence of geopolitical blocs, heavily reflecting raw resource trade dependences, as well as innovation and information flows. Increasingly however, distrust between global powers is artificially exacerbating supply crises on a global scale. Beyond **Resource competition**, all three resources are weaponized by resource-rich countries where possible, as both offensive and defensive tools in a more zero-sum geopolitical environment (see **Chapter 1.2, Economic warfare**). In this world, the export of resources will soon supplant investment as a measure of global soft power, although economic

power will continue to be leveraged to achieve strategic objectives by more subtle, indirect means. Facing actual or perceived shortages, states continue to quickly and regularly exercise control over key resources to protect their own population, which will fracture alliances, deepen conditions of scarcity, and result in escalating trade tensions that restrict the flow of climate technologies. Exposed on multiple fronts, state intervention grows in a broader range of industries, including renationalization of industries.

Confrontations regularly extend beyond the economic sphere. Transboundary conflicts and violence have become more common as one of the few ways in which states can secure supply of strategic resources. Hotspots reflect shifts to biodiversity patterns, heightened competition over terrestrial and marine foodstocks, and the pressing need for metals and minerals that underpin secure energy and technological development. Food, energy and water insecurity becomes a driver of social polarisation, civil unrest and political instability in advanced and developing economies alike. It also becomes a driver for cross-border terrorism, with devastating impacts given the proliferation of high-tech weaponry (see **Chapter 2.4: Human security**).

In this future, there has been little incentive – or fiscal room – to invest in climate change and environmental protection. Overexploitation and pollution – the tragedy of the global commons – has expanded, but continues to go unpunished or undiscovered, and existing agreements and regulations are regularly breached or not enforced. Famine has returned at a scale not seen in the last century. The sheer scale of humanitarian and environmental crises showcases broader paralysis and ineffectiveness of key multilateral mechanisms in addressing crises facing the global order, spiralling downwards into a self-perpetuating and compounding polycrises.

Endnotes

1. Tooze, Adam, "Welcome to the world of the polycrisis", *Financial Times*, 28 October 2022, https://www.ft.com/content/498398e7-11b1-494b-9cd3-6d669dc3de33. .

2. World Food Programme, *Acute food insecurity*: *Numbers explained*, 11 November 2022, https://docs.wfp.org/api/documents/WFP-0000130762/download/; Cozzi, Laura, et al., "For the first time in decades, the number of people without access to electricity is set to increase in 2022", *International Energy Agency (IEA)*, 3 November 2022, https://www.iea.org/commentaries/for-the-first-time-in-decades-the-number-of-people-without-access-to-electricity-is-set-to-increase-in-2022.

3. UN, *UN Population Division Data Portal*, https://population.un.org/dataportal/home, accessed 28 November 2022.

4. Organisation for Economic Co-operation and Development (OECD) and Food and Agricultural Organization of the United Nations (FAO), *OECD-FAO Agricultural Outlook 2022-2031*, OECD and FAO, 29 June 2022.

5. UN Environment Programme International Resource Panel, *Options for Decoupling Economic Growth from Water Use and Water Pollution*, 2015, https://www.resourcepanel.org/reports/options-decoupling-economic-growth-water-use-and-water-pollution.

6. International Energy Agency (IEA), *The Role of Critical Minerals in Clean Energy Transitions*, 2021, https://www.iea.org/reports/the-role-of-critical-minerals-in-clean-energy-transitions.

7. Hund, Kirsten, et al., *Minerals for Climate Action: The Mineral Intensity of the Clean Energy Transition*, International Bank for Reconstruction and Development and The World Bank, 2020, https://pubdocs.worldbank.org/en/961711588875536384/Minerals-for-Climate-Action-The-Mineral-Intensity-of-the-Clean-Energy-Transition.pdf.

8. Jack, Kelsey and Nick Wilkinson, *Risk and resilience: Agricultural adaptation to climate change in developing countries*, International Growth Centre (IGC), 2022, https://www.theigc.org/wp-content/uploads/2022/03/Kelsey-and-Wilkinson-Growth-brief-March-2022.pdf.

9. KPMG, *Resourcing the Energy Transition: Making the World Go Round*, 2021, https://assets.kpmg/content/dam/kpmg/xx/pdf/2021/03/resourcing-the-energy-transition.pdf; Arndt, Nicholas T., et al., "Future Global Mineral Resources", *Geochemical Perspectives*, vol. 6, no. 1, 2017, pp. 1-171, https://www.geochemicalperspectives.org/online/v6n1/.

10. Fleming, Sam, Alice Hancock and Peter Wise, "EU digs for more lithium, cobalt and graphite in green energy push", *Financial Times*, 16 August 2022, https://www.ft.com/content/363c1643-75ae-4539-897d-ab16adfc1416; Karim, Naimul, "Australian miner bails on Quebec rare earth projects amid First Nation resistance", *Financial Post*, 13 October 2022, https://financialpost.com/commodities/mining/australian-miner-bails-on-quebec-rare-earth-projects-amid-first-nation-resistance; Donnelly, Patrick, "Lawsuit Launched Seeking Final Endangered Species Protection for Nevada's Rare Tiehm's Buckwheat" [Press Release], *Center for Biological Diversity*, 25 October 2022; Barber, Gregory, "The Lithium Mine versus the Wildflower", *Wired*, 17 June 2022, https://www.wired.com/story/lithium-mine-for-batteries-versus-the-wildflower/.

11. World Economic Forum, "Circular Transformation of Industries: Unlocking New Value in a Resource-Constrained World", 2023.

12. Thomas, Helen, "Mining isn't living up to its own hype", *Financial Times*, 9 November 2022, https://www.ft.com/content/140fb908-ba2e-4fcf-8a02-74e80991b5cf?desktop=true&segmentId=7c8f09b9-9b61-4fbb-9430-9208a9e233c8#myft:notification:daily-email:content.

13. Food and Agriculture Organization of the United Nations (FAO), *Level of Water Stress (SDG 6.4.2) by major river basin*, https://data.apps.fao.org/catalog/iso/40bc32f6-1467-44ac-8f7c-3d67cbb1cbd7, accessed 16 December 2022. Conley, Heather A. and Cyrus Newlin, "Climate Change Will Reshape Russia", *Center for Strategic and International Studies*, 2021, https://www.csis.org/analysis/climate-change-will-reshape-russia.

14. The Intergovernmental Panel on Climate Change (IPCC), S*pecial Report on Climate Change and Land: Food Security*, 2022.

15. Environmental Defense Fund, *How Climate Change Will Impact U.S. Corn, Soybean and Wheat Yields: A County-Level Analysis of Climate Burdens and Adaptation Needs in the Midwest*, 2022.

16. Conley, Heather A. and Cyrus Newlin, "Climate Change Will Reshape Russia", *Center for Strategic and International Studies*, 2021, https://www.csis.org/analysis/climate-change-will-reshape-russia.Ibid.

17. Li, Man, "Climate Change to Adversely Impact Grain Production in China by 2030", *International Food Policy Research Institute (IFPRI) blog*, 13 February 2018, https://www.ifpri.org/blog/climate-change-adversely-impact-grain-production-china-2030.

18. The Intergovernmental Panel on Climate Change (IPCC), *Sixth Assessment Report: Working Group II (WGII)*, 28 February 2022, https://www.ipcc.ch/assessment-report/ar6/.

19. Thomas, Helen, "Climate is a supply chain problem that can't be ignored", *Financial Times*, 17 August 2022, https://www.ft.com/content/94375406-fb66-4f51-bb70-03e5ac7ec8ec?desktop=true&segmentId=7c8f09b9-9b61-4fbb-9430-9208a9e233c8#myft:notification:daily-email:content.

Endnotes

20. Leruth, Luc, Adnan Mazarei, Pierre Régibeau and Luc Renneboog, *22-12 Green Energy Depends on Critical Minerals. Who Controls the Supply Chains?*, Peterson Institute for International Economics, https://www.piie.com/publications/working-papers/green-energy-depends-critical-minerals-who-controls-supply-chains.

21. Dempsey, Harry, "Rio Tinto warns of excess globalisation in supply chains for critical metals", *Financial Times*, 11 October 2022, https://www.ft.com/content/6da95eb8-6def-43a9-9eb0-8a026781c31c?desktop=true&segmentId=7c8f09b9-9b61-4fbb-9430-9208a9e233c8#myft:notification:daily-email:content.

22. US Department of the Interior US Geological Survey, *Mineral Commodity Summaries 2022*, 31 January 2022, https://pubs.usgs.gov/periodicals/mcs2022/mcs2022.pdf.

23. Ibid.

24. Sevastopulo, Demetri and Edward White, "Canada orders Chinese companies to divest stakes in lithium mines", *Financial Times*, 3 November 2022, https://www.ft.com/content/6ca9a470-59ee-4809-8a5b-35f6073c9907?desktop=true&segmentId=7c8f09b9-9b61-4fbb-9430-9208a9e233c8#myft:notification:daily-email:content.

25. International Energy Agency (IEA), *World Energy Outlook Special Report: The Role of Critical Minerals in Clean Energy Transitions*, https://www.iea.org/reports/the-role-of-critical-minerals-in-clean-energy-transitions, 2022; US Geological Survey, *Mineral Commodity Summaries 2022: Nickel*, https://pubs.usgs.gov/periodicals/mcs2022/mcs2022-nickel.pdf; *Lithium*, https://pubs.usgs.gov/periodicals/mcs2022/mcs2022-lithium.pdf; *Platinum Group Metals*, https://pubs.usgs.gov/periodicals/mcs2022/mcs2022-platinum.pdf; *Cobalt*, https://pubs.usgs.gov/periodicals/mcs2022/mcs2022-cobalt.pdf; *Graphite*, https://pubs.usgs.gov/periodicals/mcs2022/mcs2022-graphite.pdf.

26. Wilson Center, *Critical Mineral Maps*, 17 March 2022, https://www.wilsoncenter.org/article/critical-mineral-maps.

27. Natural Resources Canada, *Joint Statement by Canada's Minister of Natural Resources and the European Commissioner for Internal Market*, 19 July 2021, https://www.canada.ca/en/natural-resources-canada/news/2021/07/joint-statement-by-canadas-minister-of-natural-resources-and-the-european-commissioner-for-internal-market.html.

28. Bond, David E., Francisco de Rosenzweig and Samuel Scoles, "Mexico nationalizes lithium; sets up state-owned company", *White & Case*, 9 September 2022, https://www.whitecase.com/insight-alert/mexico-nationalizes-lithium-sets-state-owned-company.

29. O'Kane, Sean, "Tesla confirms plans to build lithium refinery in Texas", *Bloomberg*, 20 October 2022, https://www.bloomberg.com/news/articles/2022-10-19/tesla-confirms-plans-to-build-lithium-refinery-in-texas.

30. KPMG, *Resourcing the Energy Transition: Making the World Go Round*, 2021, https://assets.kpmg/content/dam/kpmg/xx/pdf/2021/03/resourcing-the-energy-transition.pdf; Dempsey, Harry and Mercedes Ruehl, "Indonesia considers Opec-style cartel for battery metals", *Financial Times*, 31 October 2022, https://www.ft.com/content/0990f663-19ae-4744-828f-1bd659697468?desktop=true&segmentId=7c8f09b9-9b61-4fbb-9430-9208a9e233c8#myft:notification:daily-email:content.

31. Schipani, Andres, "How the DRC became the battleground of a proxy war over precious resources", *Financial Times*, 27 October 2022, https://www.ft.com/content/26125730-3113-4946-982a-989e2acbe472?desktop=true&segmentId=7c8f09b9-9b61-4fbb-9430-9208a9e233c8#myft:notification:daily-email:content.

32. Kyodo News, *China ship with largest-ever cannon enters Japan waters near Senkakus*, 25 November 2022, https://english.kyodonews.net/news/2022/11/cf16e72c5cb6-china-ship-with-largest-ever-cannon-enters-japan-waters-near-senkakus.html.

33. Pugh, T.A.M., et al.,"Climate analogues suggest limited potential for intensification of production on current croplands under climate change", *Nature Communications*, vol. 7, no. 12608, 20 September 2016, https://www.nature.com/articles/ncomms12608.

34. Al-Monitor, *Egypt warns of stalemate in Nile dam dispute*, 27 September 2022, https://www.al-monitor.com/originals/2022/09/egypt-warns-stalemate-nile-dam-dispute.

35. Ashraf, Tamanna and Shlomi Dinar, "Dams, Terrorism and Water Nationalism's Response to Globalization and Development: The Case of South Asia", *Terrorism and Political Violence*, vol. 34, no. 5, 3 June 2022, pp. 958-978, https://www.tandfonline.com/doi/abs/10.1080/09546553.2022.2069449.

36. UN Water, *The United Nations Water Development Report 2022: Groundwater: Making the Invisible Visible*, 21 March 2022.

4

Conclusion: is preparedness possible?

While ongoing shocks unfold, the world stands at a crossroads. As we enter a low-growth, low-investment and low-cooperation era, the actions that we take today will dictate our future risk landscape. We must ensure that addressing current crises does not detract from the longer-term view.

Recent and current events such as COVID-19 and the cost-of-living crisis are steadily eroding economic, educational and health-related gains in a widening proportion of the population, with a growing divergence between advanced and developing countries. This in turn is interacting with a multiplicity of environmental and geopolitical risks – climate change, ecosystem collapse, multi-domain conflicts – to further threaten the security and stability of societies around the world.

In this context, defensive, fragmented and crisis-oriented approaches are short-sighted and often perpetuate vicious cycles. Lack of preparedness for longer-term risks will destabilize the global risks landscape further, bringing ever tougher trade-offs for policy-makers and business leaders scrambling to address simultaneous crises. A rigorous approach to foresight and preparedness is called for, as we aim to bolster our resilience to longer-term risks and chart a path forward to a more prosperous world.

Each risk requires concerted, specific and customized efforts but several cross-cutting principles can support preparedness across themes. In this concluding section, we outline four principles for preparedness in this new era of concurrent shocks: 1) strengthening risk identification and foresight, 2) recalibrating the present value of "future" risks, 3) investing in multi-domain risk preparedness, and 4) strengthening preparedness and response cooperation.

Improving risk identification and foresight

A wide range of disciplines aim to gather intelligence about the future, ranging from economics, business management, investment funds and insurance, to urban planning, climatology, virology and civil protection – but the track record around the use of foresight to enhance risk mitigation efforts remains mixed. The underestimation of – and therefore lack of preparedness for – emerging macro risks (like "grey rhinos" and "black swans") reflect challenges posed by high levels of uncertainty, low levels of information, conflicting data and cognitive biases. Yet systematic progress is possible. Enhanced risk identification and foresight can be a key enabler for strategic decision-making, agenda-setting and resilience measures, helping to prioritize areas that would benefit from data collection and monitoring, risk controls and resources, and redundancies.

The first task of foresight is to identify future developments, risks and opportunities. Both horizon scanning and scenario planning are useful tools that can examine and build on "weak signals" in qualitative and quantitative data sources to better anticipate emerging trends. Established methods can help crystallize expert disagreements,[1] while a greater distinction between risk and uncertainty – imperfect knowledge, such that likelihood cannot be scientifically quantified or known – will help challenge core assumptions. Greater levels of uncertainty should shift the focus from the probable to the possible: the study of potential outcomes needs to be expanded to ensure that risk mitigation and preparedness addresses the full scope of possible impacts.[2] This is then complemented by risk monitoring, which focuses on providing early warning for when specific risks are about to materialize to enable advanced preparedness measures.

Another step to enhance risk foresight is to explore dynamics of change, to map interconnections between risks, including dependencies between critical systems. More sophisticated methods of analyzing interconnected risks (beyond linear relationships) can support the evaluation and prioritization of risk resources. Risks that are most influenced by or exposed to other risks will be the most challenging to mitigate, while those that exert an outsized influence on the outcome of the network can be prioritized as key points of intervention. The need for a systemic view of and approach to global risks is reflected in the rising call for the appointment of National Risk and Resilience Officers, to mirror the increasingly important role of the Chief Risk Officer in the private sector. While the mandate of this role may vary in practice, it reflects the need for a cross-cutting and whole-of-society view around external risk foresight, mitigation and crisis management.[3]

Rethinking 'future' risks

Cognitive biases channel public attention towards recent, "catastrophic" events. Business and political imperatives tend to prioritize risks with a direct, immediate and localized impact, such as food, fuel or other commodities' shortages or local environmental disasters. This is necessary to manage crises, especially when millions of lives and livelihoods are at risk. However, when such risks manifest, resources and attention are often diverted from addressing global risks, especially those that form the root causes of local catastrophes or those that may arise outside the time frames relevant to today's leaders.

This can skew preparedness efforts in the public

FIGURE 4.1

Perceptions around preparedness and governance

Source

World Economic Forum, Global Risks Perception Survey 2022-2023.

and private sector alike. For better planning and preparedness, institutions must de-anchor risk prioritization from shorter-term incentives. Despite regularly featuring in the top rankings, the most severe global risks – pertaining particularly to climate and nature – are those we are still the least prepared for. The majority of GRPS respondents assessed existing measures to prevent or prepare for the **Failure to mitigate climate change**, **Failure of climate-change adaptation**, and **Biodiversity loss and ecosystem collapse** as **ineffective** or **highly ineffective** (Figure 4.1). Similarly, most respondents considered preparedness to be inadequate for **Misinformation and disinformation**, **Erosion of social cohesion and societal polarization**, I**nvoluntary migration** and **Cost-of-living crisis**.

The growing global awareness of these risks is clear, but further action will likely continue to be stymied, given perceived shorter-term and localized crises and trade-offs. Without minimizing the need for an effective response, the over-prioritization of current challenges can quickly descend into a doom-loop of continuous global shocks, whereby resources are absorbed by crisis management, rather than directed to preparedness for future risks. Complex challenges cannot be solely solved by short-term decision-making – and yet long-term thinking alone is insufficient in the face of currently unfolding crises.

To break the cycle, business leaders and policy-makers need to embrace complexity and adopt a dual vision that more effectively balances current crisis management with a longer-term lens. For example, in the wake of the COVID-19 pandemic, governments will not only need to target resources to stabilize distressed healthcare systems, but at the same time work to ensure that environments conducive to zoonotic disease spread are adequately monitored, gain-of-function research is regulated, and that synthesis requests to bio-laboratories are screened to prevent future outbreaks from natural spillovers, accidents and threat actors.[4]

Investing in multi-domain, cross-sector risk preparedness

In addition, actions taken to address current challenges should, at a minimum, avoid exacerbating future risks, such as the potential trade-off between food security, nature loss and climate change. Recent crises have seen an extraordinary level of fiscal intervention to protect individuals and companies from the financial impacts of crises – from the COVID-19 pandemic to energy prices. While necessary and perhaps unavoidable in the circumstances at hand, it remains to be seen how significantly these rapid, large-scale actions will result in debt sustainability concerns and how widely they distracted decision-makers from other risks highlighted in this report.

Conversely, many shorter-term actions can also act as wider stabilizers, embedding and accelerating

longer-term, multi-domain resilience. Not all global risks pose a preparedness trade-off, and solutions that address both current needs and future risks can rebalance the cost-benefit ratio for necessary investment. For example, investment in health and education, key tenets of managing present needs in all societies as well as longer-term human capital and economic development, strengthens societal resilience to multiple shocks and risks including climate change.

Additionally, many global risks have the potential to impact economies and societies in an analogous way, with similar consequences. For example, cyberattacks, social unrest or extreme weather could each cause the outage of critical information infrastructure; or, on a more catastrophic scale, volcanic eruptions and war may disrupt food security.[5] Strengthening resilience efforts in critical areas therefore pays off in all scenarios and improves preparedness for a multiplicity of risks, both known and unknown, and short and long term.

Following recent shocks – the pandemic, inflation, war, among others – national governments are increasingly focusing on addressing vulnerabilities in critical systems, including potential disruptions to food, water, shelter, basic communication services and public safety, and developing multi-domain responses. A bill has been introduced in the United States of America to form an interagency committee to assess all global catastrophic risks over the next 30 years and develop strategies to ensure continuity of operations and critical infrastructure if these risks arise.[6] In addition, the UK Government is developing a tool to measure socioeconomic resilience to key civil contingencies risks, to provide a more nuanced, data-driven view on how risks impact across different communities and groups.[7]

As global risks become more intertwined, preparedness also needs to become more of a shared responsibility between sectors, with local and national governments, business and civil society each playing to their strengths, rather than traditional models of governments addressing market failures when they occur.[8] For example, private-public partnerships can help close key gaps in innovation, financing, governance and implementation of preparedness measures for emerging and well-established risks, such as food and water insecurity, weakened education and healthcare systems, and insufficient regulation of dual-use technologies, or addressing the looming insurance gap relating to cyberwarfare.[9] Innovative collaborations can also minimize overall exposure to potential impacts, as organizations across geographies and sectors are rarely exposed to the same risks at the same time. For example, data centres of different institutions in differing geographies are highly unlikely to be exposed to the same cyber or extreme weather risks, meaning effective mitigation could include regular backups of each other's systems.[10]

Re-building and strengthening global risk preparedness cooperation

While national risk preparedness can enhance the ability of societies and economies to rebound from shocks, most global risks are 'owned' by no one and sit outside the direct control of any one public or private sector entity – meaning many global risks are most effectively tackled through coordinated, global action. Respondents to the GRPS shared their views on which stakeholders were best prepared to tackle the key risks covered in the survey (Figure 4.1). The majority consider national governments, multi-country efforts and international organizations to be the most relevant stakeholders for governing these global risks – recognizing that global risks are complex, and effective preparedness can require action at local, national, regional and global levels.

International cooperation has reached levels that may have been unimaginable even a century ago. However, the recent overload of crises has turned the focus of nations inwards and the emerging outlook for international cooperation is deteriorating. Actions taken to shore up national resilience can be self-perpetuating. For example, stockpiling and export controls can directly exacerbate global shortages and position trade, financial and technological dependencies as a strategic vulnerability, spurring further disintegration. Similarly, the pursuit of domestic and global security goals may have unintended consequences for the geopolitical landscape, leading to spiralling distrust, declining safeguards against mutually assured economic destruction, and currency and technological tools that are less influential. Even areas traditionally open to collaboration, such as international climate research, are under threat. For example, data regarding Russia's boreal forests –the biggest land-based carbon store on the planet – is no longer available for international scientific research because of the war in Ukraine.[11]

International organizations will continue to play an essential role in global preparedness, even as they face significant headwinds that risk degrading the guardrails in place to address well-established issues. There have been numerous examples of the politicization and partial paralysis of key international mechanisms and organizations in recent crises. These pressures may impede the development of meaningful norms and agreements required to mitigate emerging global risks – from the proliferation of military technologies to governing the global commons. Re-invigorating multilateral processes and organizations is critical to the future of preparing for and managing global risks.

Additionally, specific cooperation at sectoral, bilateral and regional levels will become even more important in this environment. Robust data exchange and collaborative monitoring processes have already been established for some global risks (natural disasters, extreme weather events and terrorist attacks, among others). Further, open-source data and scenario development have helped increase the effectiveness of individual risk responses, such as the extensive work undertaken by the IPCC to develop a range of climate scenarios that has improved understanding, informed decarbonization strategies and allowed for collective alignment on science-based targets. However, efforts are more nascent or non-existent in other areas, such as the long-term trajectory and impact of transformative AI. Greater collaboration across industries and between countries – in terms of coordinated funding, research and data sharing – is critical to help identify weak signals of emerging threats at both a national and global level.

In a complex risks outlook, there must be a better balance between national preparedness and global cooperation. We need to act together, to shape a pathway out of cascading crises and build collective preparedness to the next global shock, whatever form it might take. Leaders must embrace complexity and act on a balanced vision to create a stronger, prosperous shared future.

Endnotes

1. UK Government Office for Science, “The Futures Toolkit: Tools for Futures Thinking and Foresight across UK Government”, November 2017, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/674209/futures-toolkit-edition-1.pdf

2. Courtney, Hugh, Jane Kirkland and Patrick Viguerie, “Strategy Under Uncertainty”, *Harvard Business Review*, 1997, https://hbr.org/1997/11/strategy-under-uncertainty.

3. Foroohar, Rana, “Wanted: a resiliency tsar for the US government”, *Financial Times*, 23 May 2021, https://www.ft.com/content/add77982-a162-4a29-a588-47c5cf121b28; Wilson, Colin, “Should the UK have a Chief Risk Officer?”, *UK Government blog*, 20 April 2022, https://actuaries.blog.gov.uk/2022/04/20/should-the-uk-have-a-chief-risk-officer/.

4. Esvelt, K., "*Delay, Detect, Defend: Preparing for a Future in which Thousands Can Release New Pandemic”*, Geneva Centre for Security Policy (GCSP), November 2022, https://dam.gcsp.ch/files/doc/gcsp-geneva-paper-29-22.

5. Avin, Shahar, Bonnie C. Wintle, Julius Weitzdörfer, Seán S. Ó hÉigeartaigh, William J. Sutherland and Martin J. Rees, “Classifying global catastrophic risks”, *Futures*, vol. 102, 2018, pp. 20-26.

6. U.S. Senate Committee on Homeland Security & Governmental Affairs, *Peters Introduces Bipartisan Bill to Ensure Federal Government is Prepared for Catastrophic Risks* [Press release], 30 June 2022, https://www.hsgac.senate.gov/media/majority-media/peters-introduces-bipartisan-bill-to-ensure-federal-government-is-prepared-for-catastrophic-risks-#:~:text=The%20Global%20Catastrophic%20Risk%20M-itigation,plans%20for%20the%20risks%20identified.

7. UK Government Cabinet Office, "The UK Government Resilience Framework", 19 December 2022, https://www.gov.uk/government/publications/the-uk-government-resilience-framework/the-uk-government-resilience-framework-html.

8. Smith-Bingham, Richard, "Partnering with Purpose," *Marsh McLennan*, November 2021, https://www.marshmclennan.com/content/dam/mmc-web/insights/publications/2021/november/Marsh_McLennan-National_Preparedness_Commission_Partnering-with-Purpose_vF.pdf.

9. LaMorte, Dylan and Joshua Gold, “Insurance Companies Move to Expand Scope of War Exclusions”, *Risk Management Magazine*, 23 November 2022, https://www.rmmagazine.com/articles/article/2022/11/23/insurers-move-to-expand-scope-of-war-exclusions.

10. Kaplan, Robert S. and Annette Mikes, “Managing Risks: A New Framework”, *Harvard Business Review*, June 2012.

11. Heal, Alexandra, “The ancient subarctic forests at risk from climate change and war”, *Financial Times*, 11 September 2022, https://www.ft.com/content/e59c800f-3704-4504-91b0-06e583d9cd42?desktop=true&segmentId=7c8f09b9-9b61-4fbb-9430-9208a9e233c8#myft:notification:daily-email:content.

Appendix A

Technical Notes: Global Risks Perception Survey 2022-2023

A "global risk" is the possibility of the occurrence of an event or condition which, if it occurs, would negatively impact a significant proportion of global GDP, population or natural resources.

Table A.1 presents the list of 32 global risks and definitions adopted in the Global Risks Perception Survey 2022-2023.

To ensure legibility, the names of some of the global risks have been abbreviated in the figures. The portion of the full name used in the abbreviation is in bold.

TABLE A.1 **Definitions of global risks**

Global risks	Description
Asset bubble bursts	Prices for housing, investment funds, shares and other assets become increasingly disconnected from the real economy, leading to a severe drop in demand and prices. Includes, but is not limited to: cryptocurrencies, energy prices, housing prices, and stock markets.
Collapse of a systemically important industry or **supply chain**	Collapse of a systemically important global industry or supply chain with an impact on the global economy, financial markets or society leading to an abrupt shock to the supply and demand of systemically important goods and services at a global scale. Includes, but is not limited to: energy, food and fast-moving consumer goods.
Debt crises	Corporate or public finances struggle to service debt accumulation, resulting in mass bankruptcies or insolvencies, liquidity crises or defaults and sovereign debt crises.
Failure to stabilize price trajectories	Inability to control the general price level of goods and services, including commodities. Inclusive of an unmanageable increase (inflation) or decrease (deflation) of prices.
Proliferation of illicit economic activity	Global proliferation of illicit economic activities and potential violence that undermine economic advancement and growth due to organized crime or the illicit activities of businesses. Includes, but is not limited to: illicit financial flows (e.g. tax evasion); and illicit trade and trafficking (e.g. counterfeiting, human trafficking, wildlife trade).
Prolonged economic downturn	Near-zero or slow global growth lasting for many years leading to periods of stagnation; or a global contraction (recession or depression).
Biodiversity loss and ecosystem collapse	Severe consequences for the environment, humankind and economic activity due to destruction of natural capital stemming from a result of species extinction or reduction spanning both terrestrial and marine ecosystems.
Failure of climate-change adaption	Failure of governments, businesses and individuals to enforce, enact or invest in effective climate-change measures to adapt to climate change, such as a lack of climate-resilient infrastructure.
Failure to mitigate climate change	Failure of governments, businesses and individuals to enforce, enact or invest in effective climate-change mitigation measures, such as the decarbonization of economic activity.
Large-scale **environmental damage incidents**	Loss of human life, financial loss and/or damage to ecosystems as a result of human activity and/or failure to co-exist with animal ecosystems. Inclusive of deregulation of industrial accidents, oil spills and radioactive contamination.
Natural disasters and extreme weather events	Loss of human life, damage to ecosystems, destruction of property and/or financial loss at a global scale due to extreme weather events. Inclusive of land-based (e.g. earthquakes, volcanos wildfires), water-based (e.g. floods), atmospheric (e.g. heat-waves), and extra-terrestrial based (e.g. comet strikes and geomagnetic storms).

Risk categories: Economic, Environmental, Geopolitical, Societal, Technological

TABLE A.1 | Definitions of Global Risks

Global risks	Description
Natural resource crises	Severe commodity and natural resource supply shortages at a global scale as a result of human overexploitation and/or mismanagement of critical natural resources. Includes, but is not limited to: chemicals, food, minerals and water.
Geoeconomic confrontation	Deployment of economic levers by global or regional powers to decouple economic interactions between nations, restricting goods, knowledge, services or technology with the intent of gaining geopolitical advantage and consolidate spheres of influence. Includes, but is not limited to: currency measures, investment controls, sanctions, state aid and subsidies, and trade controls on energy, minerals and technology.
Ineffectiveness of multilateral institutions and international cooperation	Ineffectiveness of international cooperation mechanisms due to a weakening of global multilateral institutions or marked geopolitical fragmentation. Includes, but is not limited to processes that underpin coordination on: finance, the environment, humanitarian aid, health pandemics and trade.
Interstate conflict	Belligerent bilateral or multilateral conflict between states manifesting as cyber attacks, proxy wars or hot war.
State collapse or severe instability	Collapse of a state with geopolitical significance due to the erosion of institutions and rule of law, internal civil unrest and military coups, or the effects of severe regional or global instability.
Terrorist attacks	Large-scale or persistent small-scale terrorist attacks carried out by non-state actors with ideological, political or religious goals, resulting in loss of life, severe injury or material damage caused by biological, chemical, nuclear or radiological weapons or other means.
Use of weapons of mass destruction	Deployment of biological, chemical, cyber, nuclear, radiological or autonomous AI weapons, resulting in loss of life, destruction and/or international crises.
Chronic diseases and **health conditions**	Widescale increase in chronic physical health conditions. Includes, but is not limited to, conditions linked to excessive consumption habits and economic activity that releases harmful pollutants in the air, water or food through agricultural, industrial and household practices.
Collapse or lack of public infrastructure and services	Non-existence, or widespread bankruptcy of social security systems and erosion of social security benefits, alongside inequitable or insufficient public infrastructure and services. Includes but is not limited to lack of disability and family benefits, as well as affordable and adequate housing, public education, child and elder care, healthcare, transportation systems and urban development.
Cost-of-living crisis	Significant inability among broad sections of populations to maintain their current lifestyle due to increases in the cost of essential goods which are not matched with a rise in real household income.
Employment crises	Structural deterioration of work prospects or standards of work. Includes, but is not limited to: erosion of workers' rights; stagnating wages; rising unemployment and underemployment; displacement due to automation; stagnant social mobility; and geographical or industry mismatches between labour supply and demand.
Erosion of social cohesion and societal polarization	Loss of social capital and fracturing of communities leading to declining social stability, individual and collective well-being and economic productivity. Includes, but is not limited to: persistent and potentially violent civil unrest; and actual or perceived inequalities in opportunities across age, income bracket, ethnicity and race, educational background, demographic characteristics, and political affiliation.
Infectious diseases	Massive and rapid spread of viruses, parasites, fungi or bacteria that cause an uncontrolled contagion of infectious diseases, resulting in an epidemic or pandemic with loss of life and economic disruption. Includes, but is not limited to: zootic diseases, accidental or intentional releases of natural or man-made pathogens, the resurgence of pre-existing diseases due to lower levels of immunity, and the rise of antimicrobial resistance.
Large-scale involuntary migration	Large-scale involuntary migration and displacement across or within borders, stemming from: persistent discrimination and persecution, lack of economic advancement opportunities, natural or human-made disasters, and internal or interstate conflict.
Misinformation and disinformation	Persistent false information (deliberate or otherwise) widely spread through media networks, shifting public opinion in a significant way towards distrust in facts and authority. Includes, but is not limited to, dissemination by: states, public figures, media organizations and networks of individuals.
Severe mental health deterioration	Widescale spread of mental health disorders or rising inequality globally across multiple demographics, which negatively impacts well being, social cohesion and productivity. Includes, but is not limited to: anxiety, dementia, depression, loneliness and stress.

Risk categories: Economic | Environmental | Geopolitical | Societal | Technological

TABLE A.1 | Definitions of Global Risks

Global risks	Description
Adverse outcomes of frontier technologies	Intended or unintended negative consequences of technological advances on individuals, businesses, ecosystems and/or economies. Includes, but is not limited to: AI, brain-computer interfaces, biotechnology, geo-engineering, quantum computing and the metaverse.
Breakdown of critical information infrastructure	Deterioration, overload or shutdown of critical physical and digital infrastructure or services leading to the breakdown of internet, cellular devices, public utilities or satellites. Stemming from, but not limited to, cyberattacks, intentional or unintentional physical damage, or solar storms.
Digital inequality and lack of access to digital services	Fractured or unequal access to digital networks and technologies stemming from underinvestment, low digital skills, insufficient purchasing power, or government restrictions on technologies.
Digital power concentration	Concentration of critical digital assets, capabilities or knowledge among a small number of individuals, businesses or states that can control access to digital technologies and demand discretionary pricing. Stemming from, but not limited to, the failure of anti-trust regulation, inadequate investment in the innovation ecosystem, or state control over key technologies.
Widespread cybercrime and cyber insecurity	Increasingly sophisticated cyberespionage or cybercrimes. Includes, but is not limited to: loss of privacy, data fraud or theft, and cyber espionage.

Risk categories: Economic, Environmental, Geopolitical, Societal, Technological

Technical notes

The Global Risks Perception Survey (GRPS) is the World Economic Forum's source of original risks data, harnessing the expertise of the Forum's extensive network of academic, business, government, civil society and thought leaders. Survey responses were collected from 7 September to 5 October 2022 from the World Economic Forum's multistakeholder communities.

Updates to the GRPS 2022-2023

The list of 32 global risks included in the survey was updated in 2022.

Two new risks were added in response to observed economic, geopolitical and environmental trends:

1. "Cost-of-living crisis"
2. "Misinformation and disinformation"

In addition, "Climate action failure" was delineated into two separate risks:

1. "Failure of climate-change adaption"
2. "Failure to mitigate climate change"

The names and definitions of the remaining risks have been revised and, where applicable, merged, modified and/or expanded to reflect new ways in which the risks may materialize and the potential adverse outcomes they may cause. However, to ensure comparability over time, although names and definitions were modified, the fundamental concept of each risk has remained consistent with that of previous versions of the survey.

Methodology

The GRPS 2022–2023 was further refined this year to gather more granular perceptions of risk and to incorporate new approaches to risk management and analysis. The GRPS 2022–2023 was comprised of six sections:

1. **Outlook for the World** asked respondents to characterize their outlook for the world over the short term (two years) and the long term (10 years). Respondents were provided with five options: (1) Progressive tipping points and persistent crises leading to catastrophic outcomes, (2) Consistently volatile across economies and industries with multiple shocks accentuating divergent trajectories, (3) Slightly volatile with occasional localized surprises, (4) Limited volatility with relative stability, and (5) Renewed stability with a revival of global resilience. A simple tally for each of the five options was calculated. The result is illustrated in Figure 1.10.
2. **Currently Manifesting Risks** asked

respondents to rank the top five risks among 14 pre-selected risks in order of how severe they believe their impact will be on a global level in 2023. The final rank is the average rank estimated by the respondents, weighted by the number of respondents who selected the particular risk. Options included: **Continued waves of COVID-19, Cost-of-living crisis, Cyberattacks on critical infrastructure, Debt crisis, Deployment of chemical and biological weapons** on a catastrophic scale, **Deployment of nuclear weapons** on a catastrophic scale, **Disruptions in global supply chains for non-food goods, Energy supply crisis, Failure to set and meet national net-zero targets, Food supply crisis, Rising inflation, Structural failures in health systems, Weakening of human rights**, and **Weaponization of economic policy** such as sanctions and trade controls. To ensure legibility, the names of some of the global risks have been abbreviated in the figures. The portion of the full name used in the abbreviation is in bold. The result is illustrated in Figure 1.1.

3. **Global Severity 2 Years and 10 Years** asked respondents to estimate the likely impact (severity) for each of the 32 global risks, on a 1-7 scale [1 – Low severity, 7 – High severity], over both a two-year and 10-year period. Respondents were asked to evaluate the severity, considering the impact on populations, GDP or environmental resources on a global scale. They were also allowed to nominate any other risk considered missing from the 32 global risks. A simple average based on the scores selected was calculated. The results are illustrated in Figure 1.2 and Figure 2.1.

4. **Global Risks Consequences** seeks to understand of the potential consequences of risks, to create a network map of the global risk landscape. Respondents were provided 10 randomly selected global risks (from the full list of 32 global risks), and were then asked to select up to five global risks (from the full list) likely to be triggered by each of the 10 risks materializing. In visual results, “Nodes: Risk influence” is based on a simple tally of all bidirectional relationships identified by respondents. “Edges: Relative influence” is based on a simple tally of the number of times the risk was identified as a consequence. However, visual do not show all connections: weaker relationships identified by less than 25% of respondents were not included as edges. "Employment crises" was not offered as a randomly selected risk, and is shown only as a consequence. “Prolonged economic downturn” was not offered as a consequence, and is only shown as a cause.

5. **Risk Preparedness and Governance** asked respondents to indicate the current effectiveness of risk management across economies and multiple stakeholders, taking into account any mechanism in place to prevent the risk from occurring or prepare to mitigate its impact. The respondent was provided 10 randomly selected global risks, and was asked to rate current effectiveness based on five options: (1) Highly ineffective, (2) Ineffective, (3) Indeterminate effectiveness, (4) Effective, and (5) Highly effective. A simple tally of the number of times a risk was identified on each level of the five-point effectiveness scale was calculated on this basis. The result is illustrated in Figure 4.1.

   Respondents were then asked to identify up to three stakeholders who can effectively manage the most severe risks identified in Section 3. Respondents could choose among the following eight entities: local government, national government, bilateral, multi-country, regional, international organization, businesses, public-private cooperation. A simple tally of the number of times a stakeholder was identified as effective was calculated on this basis. The result is illustrated in Figure 4.1.

6. **Future Outlook for the World** captured the respondents’ outlook on global cooperation over the next 10 years. Respondents were asked to select from among three options: (1) Broad-base convergence to a multilateral rules-based order, (2) Fractures between competing economies which consolidate into blocs and new structures for cooperation, and (3) Wide-scale division of economies into competing blocks with divergent standards, values and paradigms with limited collaboration. A simple tally for each of the three options was calculated.

Completion thresholds
A total of 1,316 responses to the GRPS were received. From these, 1,249 were kept, using as a threshold at least one non-demographic answer.

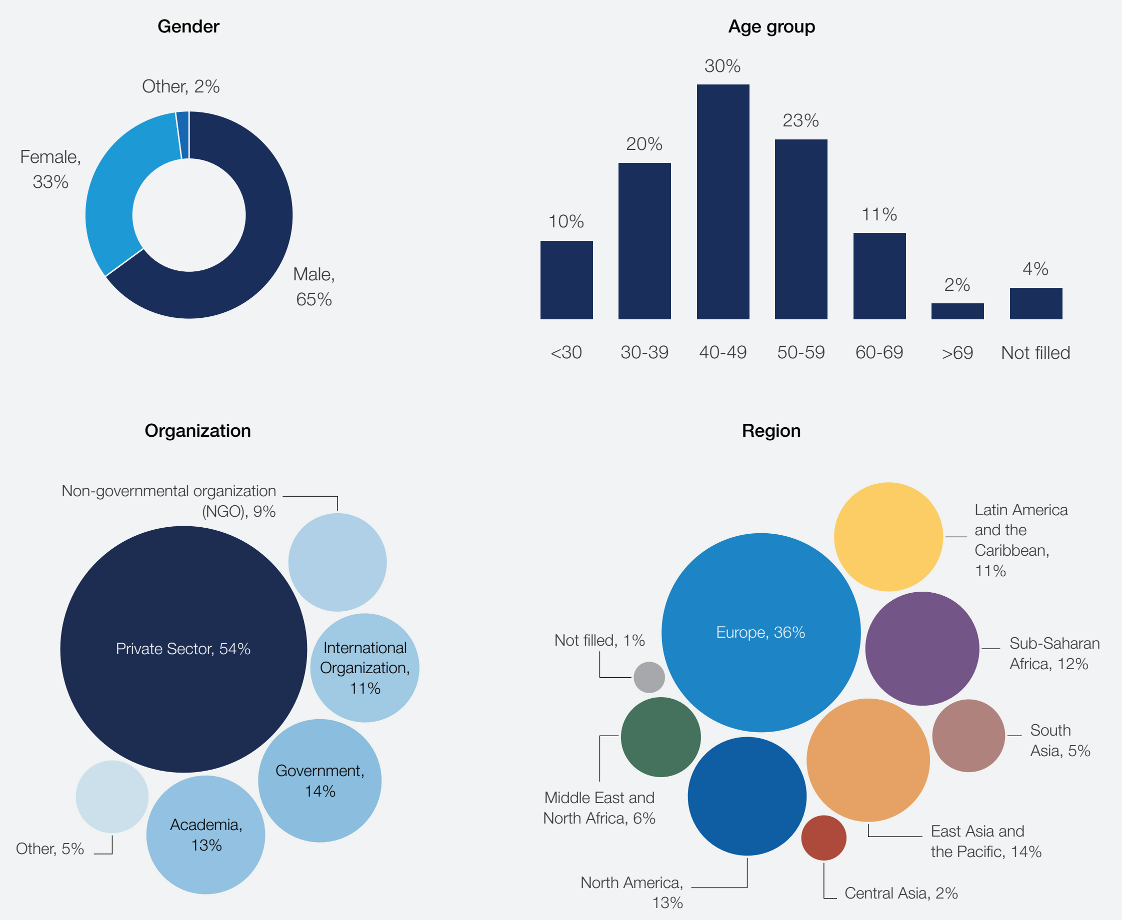
- **Outlook for the World**: 1,244 respondents selected at least one of the short-term and long-term world outlook options.
  - **Short**-term outlook for the world: 1,233
  - **Long**-term outlook for the world: 1,231
- **Currently Manifesting Risks**: 1,180 respondents ranked at least one manifesting risk.
- **Global Severity 2 Years and 10 Years**: 1,091 respondents evaluated the severity of at least one risk in one time frame.
  - Short-term severity: 1,086
  - Long-term severity: 999
- **Global Risks Consequences**: 877 respondents paired at least one materializing risk with its consequence.

- **Risk Preparedness and Governance**: 869 respondents answered at least one of the preparedness and governance questions.
  - 839 respondents scored the effectiveness level for at least one risk
  - 789 respondents mapped at least one stakeholder against at least one risk
- **Future Outlook for the World**: 869 respondents answered the Future Outlook for the World question.
- **Sample distribution**: the 1,249 respondent who answered at least one non-demographic question were used to calculate the sample distribution by place of residence (region), gender, age, area of expertise and organization type.

Figure A.2 presents some key descriptive statistics and information about the profiles of the respondents.

FIGURE A.2

Survey sample composition



Source

World Economic Forum Global Risks Perception Survey 2022-2023.

Appendix B

Executive Opinion Survey: National Risk Perceptions

Figure B.1 presents the list of 35 risks that were incorporated into the World Economic Forum's 2022 Executive Opinion Survey (EOS), which was administered between April and September 2022. The risks are comparable to those in the GRPS (Global Risks Perception Survey) but are applied at a more granular level to reflect the possible short-term and country-level manifestations of global risks.

To ensure legibility, the names of some of the global risks have been abbreviated in the figures. The portion of the full name used in the abbreviation is in bold.

TABLE B.1

List of risks

Asset bubble burst	**Terrorist attacks**
Collapse of a systemically important industry	**Weapons of mass destruction**
Debt crises	**Collapse** or lack **of** social **services and public infrastructure**
Proliferation of illicit economic activity	**Cost-of-living crisis**
Prolonged economic stagnation	**Employment** and livelihood **crises**
Rapid and/or sustained inflation	**Erosion of social cohesion** and well-being
Severe commodity price shocks or volatility (e.g. energy, food, metals)	**Infectious diseases**
Blue (marine/freshwater) **biodiversity loss** and ecosystem collapse	**Large-scale involuntary migration**
Failure of climate-change adaption	**Misinformation**
Failure of climate-change mitigation	**Pollution-driven harms to human health**
Terrestrial biodiversity loss and ecosystem collapse	**Severe mental health deterioration**
Human-made environmental damage	**Widespread youth disillusionment**
Natural disasters and extreme weather events	**Automation and displacement of jobs**
Severe commodity supply crises (incl. energy, food, water)	**Breakdown of critical** information **infrastructure** through cyber attacks
Geoeconomic confrontations (incl. sanctions, trade wars, investment screening)	**Digital power concentration** and monopolies
Geopolitical contestation of strategic **resources** (incl. technology, energy, minerals)	**Failure of cybersecurity measures** (incl. loss of privacy, data fraud or theft, cyber espionage)
Interstate conflict	Lack of widespread digital services and **digital inequality**
State collapse	

Risk categories: Economic, Environmental, Geopolitical, Societal, Technological

Source

World Economic Forum Global Risks Perception Survey 2022-2023.

Figure B.2 presents the top five risks for each of the 121 economies surveyed.

Over 12,000 respondents were presented with the following question: "Which five risks are the most likely to pose the biggest threat to your country in the next two years?" and were asked to select these from a list of 35 risks.

"Risk 1" indicates the most frequently selected risk in each economy. Tied risks are presented in alphabetical order, with the tie indicated by numbering. For example, in Angola, two risks ("Rapid and/or sustained inflation" and "Employment and livelihood crises") are tied for first place and there is, therefore, no risk listed in second place.

TABLE B.2

Top five risks identified by the Executive Opinion Survey (EOS)

Albania

1	Infectious diseases
2	Failure of cybersecurity measures
3	Rapid and/or sustained inflation
4	Geopolitical contestation of resources
5	Severe commodity supply crises

Armenia

1	Interstate conflict
2	Rapid and/or sustained inflation
3	Erosion of social cohesion
4	Severe commodity price shocks
5	Geoeconomic confrontation

Bangladesh

1	Rapid and/or sustained inflation
2	Debt crises
3	Severe commodity price shocks
4	Human-made environmental damage
5	Geopolitical contestation of resources

Algeria

1	Rapid and/or sustained inflation
2	Cost-of-living crisis
3	Digital inequality
4	Geopolitical contestation of resources
5	Interstate conflict

Australia

1	Cost-of-living crisis
2	Debt crises
2	Rapid and/or sustained inflation
4	Geoeconomic confrontation
5	Failure of climate-change adaptation

Barbados

1	Natural disasters and extreme weather events
2	Cost-of-living crisis
3	Rapid and/or sustained inflation
4	Severe commodity price shocks
5	Debt crises

Angola

1	Rapid and/or sustained inflation
1	Employment and livelihood crises
3	Cost-of-living crisis
4	Collapse of services and public infrastructure
5	Severe commodity supply crises

Austria

1	Rapid and/or sustained inflation
2	Severe commodity price shocks
3	Breakdown of critical infrastructure
4	Geoeconomic confrontation
5	Geopolitical contestation of resources

Belgium

1	Cost-of-living crisis
2	Rapid and/or sustained inflation
3	Failure of climate-change adaptation
4	Debt crises
5	Geoeconomic confrontation

Argentina

1	Rapid and/or sustained inflation
2	Debt crises
2	Proliferation of illicit economic activity
4	State collapse
5	Severe commodity supply crises

Bahrain

1	Cost-of-living crisis
2	Debt crises
3	Severe commodity price shocks
4	Prolonged economic stagnation
4	Rapid and/or sustained inflation

Benin

1	Cost-of-living crisis
2	Severe commodity price shocks
3	Employment and livelihood crises
4	Rapid and/or sustained inflation
5	Severe commodity supply crises

Risk categories: Economic, Environmental, Geopolitical, Societal, Technological

TABLE B.2 | Top five risks identified by the Executive Opinion Survey (EOS)

Bolivia (Plurinational State of)

1	Prolonged economic stagnation
1	Digital inequality
3	Employment and livelihood crises
4	State collapse
5	Human-made environmental damage
5	Debt crises
5	Erosion of social cohesion

Bosnia and Herzegovina

1	Severe commodity supply crises
1	State collapse
3	Severe commodity price shocks
4	Digital inequality
5	Cost-of-living crisis

Botswana

1	Cost-of-living crisis
2	State collapse
3	Severe commodity supply crises
4	Failure of cybersecurity measures
5	Debt crises

Brazil

1	Rapid and/or sustained inflation
2	Proliferation of illicit economic activity
3	Geoeconomic confrontation
4	Severe commodity price shocks
4	Employment and livelihood crises

Bulgaria

1	Rapid and/or sustained inflation
2	Proliferation of illicit economic activity
3	Cost-of-living crisis
4	Interstate conflict
5	State collapse

Cambodia

1	Geoeconomic confrontation
2	Cost-of-living crisis
2	Digital inequality
4	Geopolitical contestation of resources
5	Failure of climate-change adaptation

Cameroon

1	Cost-of-living crisis
2	Debt crises
3	Digital inequality
4	Employment and livelihood crises
5	Geopolitical contestation of resources

Canada

1	Cost-of-living crisis
2	Debt crises
3	Rapid and/or sustained inflation
4	Failure of climate-change adaptation
5	Asset bubble burst

Cape Verde

1	Debt crises
2	Cost-of-living crisis
3	Geoeconomic confrontation
4	Rapid and/or sustained inflation
5	Employment and livelihood crises

Chad

1	Employment and livelihood crises
2	Geopolitical contestation of resources
3	Terrestrial biodiversity loss and ecosystem collapse
4	Blue biodiversity loss and ecosystem collapse
5	Debt crises
5	Digital inequality
5	Digital power concentration

Chile

1	Rapid and/or sustained inflation
2	Erosion of social cohesion
3	Proliferation of illicit economic activity
4	Severe commodity supply crises
5	State collapse

China

1	Geoeconomic confrontation
2	Natural disasters and extreme weather events
3	Rapid and/or sustained inflation
4	Infectious diseases
5	Geopolitical contestation of resources
5	Asset bubble burst
5	Digital power concentration

Colombia

1	Rapid and/or sustained inflation
2	Digital inequality
3	Employment and livelihood crises
4	State collapse
5	Cost-of-living crisis

Risk categories: Economic | Environmental | Geopolitical | Societal | Technological

TABLE B.2 | Top five risks identified by the Executive Opinion Survey (EOS)

Congo (Democratic Republic of)

1	Digital inequality
2	State collapse
3	Debt crises
5	Interstate conflict
5	Cost-of-living crisis
5	Digital power concentration

Costa Rica

1	Cost-of-living crisis
2	Debt crises
3	Breakdown of critical infrastructure
4	Rapid and/or sustained inflation
5	Natural disasters and extreme weather events

Côte d'Ivoire

1	Cost-of-living crisis
2	Debt crises
3	Terrorist attacks
4	Rapid and/or sustained inflation
5	Failure of cybersecurity measures

Cyprus

1	Rapid and/or sustained inflation
2	Cost-of-living crisis
3	Failure of climate-change adaptation
3	Geoeconomic confrontation
5	Severe commodity supply crises

Czechia

1	Rapid and/or sustained inflation
2	Severe commodity supply crises
3	Severe commodity price shocks
4	Geopolitical contestation of resources
5	Interstate conflict

Denmark

1	Breakdown of critical infrastructure
2	Rapid and/or sustained inflation
3	Severe commodity price shocks
4	Geoeconomic confrontation
5	Asset bubble burst

Dominican Republic

1	Cost-of-living crisis
2	Debt crises
3	Rapid and/or sustained inflation
4	Natural disasters and extreme weather events
5	Severe commodity price shocks

Ecuador

1	Prolonged economic stagnation
2	Digital inequality
3	Natural disasters and extreme weather events
3	Employment and livelihood crises
5	State collapse

Egypt

1	Debt crises
2	Rapid and/or sustained inflation
3	Cost-of-living crisis
4	Prolonged economic stagnation
5	Severe commodity price shocks

El Salvador

1	Debt crises
2	State collapse
3	Cost-of-living crisis
4	Natural disasters and extreme weather events
5	Employment and livelihood crises

Estonia

1	Severe commodity price shocks
2	Geoeconomic confrontation
3	Interstate conflict
5	Severe commodity supply crises
5	Rapid and/or sustained inflation
5	Cost-of-living crisis

Finland

1	Geoeconomic confrontation
2	Prolonged economic stagnation
3	Severe commodity price shocks
4	Interstate conflict
4	Rapid and/or sustained inflation

France

1	Debt crises
2	Severe commodity price shocks
3	Rapid and/or sustained inflation
3	Cost-of-living crisis
3	Erosion of social cohesion

Risk categories: Economic, Environmental, Geopolitical, Societal, Technological

TABLE B.2 | **Top five risks identified by the Executive Opinion Survey (EOS)**

Georgia

1	Cost-of-living crisis
2	Interstate conflict
3	Geoeconomic confrontation
3	Digital power concentration
5	Rapid and/or sustained inflation

Germany

1	Rapid and/or sustained inflation
2	Severe commodity price shocks
3	Interstate conflict
4	Severe commodity supply crises
4	Geopolitical contestation of resources

Ghana

1	Debt crises
2	Cost-of-living crisis
3	Human-made environmental damage
4	Employment and livelihood crises
5	Failure of cybersecurity measures

Greece

1	Cost-of-living crisis
2	Severe commodity price shocks
2	Rapid and/or sustained inflation
4	Debt crises
5	Interstate conflict
5	Geoeconomic confrontation

Guatemala

1	Natural disasters and extreme weather events
2	Collapse of services and public infrastructure
3	Prolonged economic stagnation
4	State collapse
5	Digital inequality

Honduras

1	Rapid and/or sustained inflation
2	Natural disasters and extreme weather events
3	State collapse
4	Employment and livelihood crises
5	Cost-of-living crisis

Hong Kong SAR, China

1	Geoeconomic confrontation
2	Prolonged economic stagnation
3	Asset bubble burst
4	Cost-of-living crisis
5	Infectious diseases

Hungary

1	Rapid and/or sustained inflation
2	Infectious diseases
3	Geoeconomic confrontation
4	Cost-of-living crisis
5	Natural disasters and extreme weather events
5	Severe commodity price shocks

Hungary

1	Rapid and/or sustained inflation
2	Cost-of-living crisis
3	Asset bubble burst
4	Natural disasters and extreme weather events
4	Breakdown of critical infrastructure

India

1	Digital inequality
2	Geopolitical contestation of resources
3	Cost-of-living crisis
4	Debt crises
5	Natural disasters and extreme weather events

Indonesia

1	Debt crises
2	Interstate conflict
2	Rapid and/or sustained inflation
4	Digital inequality
5	Geopolitical contestation of resources

Ireland

1	Rapid and/or sustained inflation
2	Cost-of-living crisis
3	Geoeconomic confrontation
4	Severe commodity price shocks
5	Failure of climate-change adaptation

Risk categories: Economic | Environmental | Geopolitical | Societal | Technological

TABLE B.2 Top five risks identified by the Executive Opinion Survey (EOS)

Israel

1 Cost-of-living crisis
2 Terrorist attacks
3 Interstate conflict
4 Geoeconomic confrontation
5 Asset bubble burst

Jordan

1 Debt crises
2 Severe commodity supply crises
2 Cost-of-living crisis
4 Severe commodity price shocks
5 Employment and livelihood crises

Kuwait

1 Rapid and/or sustained inflation
1 Cost-of-living crisis
3 Severe commodity price shocks
4 Human-made environmental damage
4 Interstate conflict

Italy

1 Debt crises
2 Interstate conflict
2 Rapid and/or sustained inflation
4 Failure of climate-change adaptation
5 Asset bubble burst

Kazakhstan

1 Geoeconomic confrontation
2 Rapid and/or sustained inflation
3 Geopolitical contestation of resources
4 Interstate conflict
5 Severe commodity price shocks

Kyrgyzstan

1 Interstate conflict
2 Debt crises
3 State collapse
4 Severe commodity supply crises
5 Infectious diseases

Jamaica

1 Rapid and/or sustained inflation
2 Cost-of-living crisis
3 Natural disasters and extreme weather events
4 Proliferation of illicit economic activity
5 Severe commodity price shocks

Kenya

1 Debt crises
2 Cost-of-living crisis
3 Employment and livelihood crises
4 Geopolitical contestation of resources
5 Failure of climate-change adaptation

Lao PDR

1 Rapid and/or sustained inflation
2 Severe commodity price shocks
3 Infectious diseases
4 Cost-of-living crisis
5 Employment and livelihood crises

Japan

1 Geoeconomic confrontation
2 Natural disasters and extreme weather events
3 Prolonged economic stagnation
4 Severe commodity price shocks
5 Geopolitical contestation of resources

Kosovo

1 Human-made environmental damage
1 Rapid and/or sustained inflation
1 Cost-of-living crisis
4 Geoeconomic confrontation
5 Failure of cybersecurity measures
5 Digital inequality

Latvia

1 Rapid and/or sustained inflation
2 Interstate conflict
3 Cost-of-living crisis
4 Employment and livelihood crises
5 Debt crises

Risk categories: Economic, Environmental, Geopolitical, Societal, Technological

TABLE B.2 | Top five risks identified by the Executive Opinion Survey (EOS)

Lesotho

1	Geopolitical contestation of resources	Geopolitical
2	Collapse of services and public infrastructure	Societal
3	Digital inequality	Technological
4	Collapse of a systemically important industry	Economic
5	Proliferation of illicit economic activity	Economic

Liberia

1	Cost-of-living crisis	Societal
2	Rapid and/or sustained inflation	Economic
3	Prolonged economic stagnation	Economic
4	Employment and livelihood crises	Societal
5	Proliferation of illicit economic activity	Economic

Lithuania

1	Severe commodity price shocks	Economic
2	Interstate conflict	Geopolitical
3	Rapid and/or sustained inflation	Economic
4	Geoeconomic confrontation	Geopolitical
5	Severe commodity supply crises	Environmental

Luxembourg

1	Rapid and/or sustained inflation	Economic
2	Cost-of-living crisis	Societal
3	Severe commodity price shocks	Economic
4	Severe commodity supply crises	Environmental
5	Geoeconomic confrontation	Geopolitical

Malawi

1	Debt crises	Economic
2	Cost-of-living crisis	Societal
3	Prolonged economic stagnation	Economic
4	Rapid and/or sustained inflation	Economic
5	Failure of climate-change adaptation	Environmental

Malaysia

1	Cost-of-living crisis	Societal
2	Rapid and/or sustained inflation	Economic
3	Debt crises	Economic
4	Geoeconomic confrontation	Geopolitical
5	Human-made environmental damage	Environmental
5	Severe commodity supply crises	Environmental
5	Severe commodity price shocks	Economic
5	Prolonged economic stagnation	Economic
5	Failure of cybersecurity measures	Technological

Mali

1	Geopolitical contestation of resources	Geopolitical
2	Employment and livelihood crises	Societal
3	Geoeconomic confrontation	Geopolitical
4	Terrorist attacks	Geopolitical
5	Breakdown of critical infrastructure	Technological

Malta

1	Cost-of-living crisis	Societal
2	Human-made environmental damage	Environmental
3	Rapid and/or sustained inflation	Economic
4	Severe commodity price shocks	Economic
5	Digital inequality	Technological

Mauritius

1	Cost-of-living crisis	Societal
2	Debt crises	Economic
3	Rapid and/or sustained inflation	Economic
4	Natural disasters and extreme weather events	Environmental
5	Severe commodity price shocks	Economic

Mexico

1	Rapid and/or sustained inflation	Economic
2	Proliferation of illicit economic activity	Economic
2	Prolonged economic stagnation	Economic
4	State collapse	Geopolitical
4	Erosion of social cohesion	Societal

Mongolia

1	Debt crises	Economic
2	Human-made environmental damage	Environmental
3	Geoeconomic confrontation	Geopolitical
4	Employment and livelihood crises	Societal
5	Interstate conflict	Geopolitical

Montenegro

1	Cost-of-living crisis	Societal
2	Geoeconomic confrontation	Geopolitical
3	Prolonged economic stagnation	Economic
4	Failure of climate-change adaptation	Environmental
5	Human-made environmental damage	Environmental
5	Severe commodity supply crises	Environmental
5	Debt crises	Economic
5	Employment and livelihood crises	Societal

Morocco

1	Cost-of-living crisis	Societal
2	Rapid and/or sustained inflation	Economic
2	Severe commodity price shocks	Economic
4	Severe commodity supply crises	Environmental
5	Debt crises	Economic

Risk categories: Economic | Environmental | Geopolitical | Societal | Technological

TABLE B.2 | **Top five risks identified by the Executive Opinion Survey (EOS)**

Namibia

1 Debt crises
2 Cost-of-living crisis
3 Employment and livelihood crises
5 Failure of climate-change adaptation
5 Prolonged economic stagnation
5 Digital inequality

Nigeria

1 Terrorist attacks
2 Debt crises
3 Cost-of-living crisis
4 Severe commodity supply crises
5 Rapid and/or sustained inflation
5 Employment and livelihood crises

Panama

1 Employment and livelihood crises
2 Debt crises
3 Digital inequality
4 Cost-of-living crisis
5 Proliferation of illicit economic activity
5 Rapid and/or sustained inflation

Nepal

1 Geopolitical contestation of resources
2 Debt crises
3 Human-made environmental damage
4 Natural disasters and extreme weather events
5 Digital inequality

North Macedonia

1 Cost-of-living crisis
2 Debt crises
3 Human-made environmental damage
4 Rapid and/or sustained inflation
5 Prolonged economic stagnation

Paraguay

1 Prolonged economic stagnation
2 Collapse of services and public infrastructure
2 Digital inequality
4 Natural disasters and extreme weather events
5 State collapse

Netherlands

1 Failure of climate-change adaptation
2 Rapid and/or sustained inflation
3 Geoeconomic confrontation
3 Geopolitical contestation of resources
5 Cost-of-living crisis

New Zealand

1 Cost-of-living crisis
2 Rapid and/or sustained inflation
3 Natural disasters and extreme weather events
4 Asset bubble burst
5 Debt crises

Oman

1 Debt crises
2 Natural disasters and extreme weather events
3 Severe commodity price shocks
3 Cost-of-living crisis
5 Geopolitical contestation of resources
5 Proliferation of illicit economic activity

Pakistan

1 Digital power concentration
2 Failure of cybersecurity measures
3 Rapid and/or sustained inflation
4 Debt crises
5 State collapse

Peru

1 State collapse
2 Digital inequality
3 Rapid and/or sustained inflation
4 Proliferation of illicit economic activity
5 Employment and livelihood crises

Philippines

1 Natural disasters and extreme weather events
2 Debt crises
3 Rapid and/or sustained inflation
4 Misinformation
5 Geopolitical contestation of resources

Risk categories: Economic | Environmental | Geopolitical | Societal | Technological

TABLE B.2 Top five risks identified by the Executive Opinion Survey (EOS)

Poland

1	Rapid and/or sustained inflation
2	Breakdown of critical infrastructure
3	Geoeconomic confrontation
4	Employment and livelihood crises
5	Interstate conflict

Portugal

1	Rapid and/or sustained inflation
2	Cost-of-living crisis
3	Debt crises
4	Severe commodity price shocks
5	Prolonged economic stagnation

Qatar

1	Cost-of-living crisis
2	Natural disasters and extreme weather events
2	Geoeconomic confrontation
4	Geopolitical contestation of resources
4	Severe commodity price shocks
4	Rapid and/or sustained inflation
4	Failure of cybersecurity measures

Romania

1	Rapid and/or sustained inflation
2	Geoeconomic confrontation
3	Interstate conflict
4	Severe commodity price shocks
4	Cost-of-living crisis

Rwanda

1	Rapid and/or sustained inflation
1	Cost-of-living crisis
3	Severe commodity price shocks
4	Natural disasters and extreme weather events
5	Interstate conflict

Saudi Arabia

1	Cost-of-living crisis
2	Interstate conflict
3	Rapid and/or sustained inflation
4	Severe commodity price shocks
4	Breakdown of critical infrastructure
4	Failure of cybersecurity measures

Senegal

1	Cost-of-living crisis
2	Debt crises
2	Employment and livelihood crises
4	Rapid and/or sustained inflation
5	Severe commodity supply crises

Serbia

1	Geoeconomic confrontation
1	Severe commodity price shocks
3	Interstate conflict
4	Cost-of-living crisis
5	Asset bubble burst
5	Severe commodity supply crises

Sierra Leone

1	Cost-of-living crisis
2	Rapid and/or sustained inflation
3	Debt crises
4	Natural disasters and extreme weather events
4	State collapse
4	Employment and livelihood crises
4	Digital inequality

Singapore

1	Geoeconomic confrontation
2	Rapid and/or sustained inflation
3	Severe commodity supply crises
4	Severe commodity price shocks
5	Cost-of-living crisis

Slovakia

1	Rapid and/or sustained inflation
2	Severe commodity price shocks
3	Severe commodity supply crises
4	Asset bubble burst
4	Interstate conflict

Slovenia

1	Severe commodity price shocks
2	Geoeconomic confrontation
3	Rapid and/or sustained inflation
4	Severe commodity supply crises
5	Geopolitical contestation of resources

Risk categories: Economic, Environmental, Geopolitical, Societal, Technological

TABLE B.2 | Top five risks identified by the Executive Opinion Survey (EOS)

South Africa

1 State collapse
2 Debt crises
2 Collapse of services and public infrastructure
2 Cost-of-living crisis
5 Employment and livelihood crises

South Korea

1 Rapid and/or sustained inflation
2 Proliferation of illicit economic activity
3 Severe commodity supply crises
3 Severe commodity price shocks
5 Asset bubble burst
5 Debt crises

Spain

1 Rapid and/or sustained inflation
2 Debt crises
3 Cost-of-living crisis
4 Employment and livelihood crises
5 Geopolitical contestation of resources
5 Proliferation of illicit economic activity

Sri Lanka

1 Debt crises
2 Cost-of-living crisis
3 State collapse
3 Rapid and/or sustained inflation
5 Severe commodity supply crises

Sweden

1 Rapid and/or sustained inflation
2 Cost-of-living crisis
3 Debt crises
4 Failure of climate-change adaptation
5 Terrorist attacks
5 Geoeconomic confrontation
5 Collapse of a systemically important industry

Switzerland

1 Severe commodity price shocks
2 Severe commodity supply crises
3 Geoeconomic confrontation
3 Rapid and/or sustained inflation
5 Natural disasters and extreme weather events
5 Geopolitical contestation of resources
5 Breakdown of critical infrastructure through cyber attacks

Taiwan, China

1 Geoeconomic confrontation
2 Rapid and/or sustained inflation
3 Infectious diseases
4 Natural disasters and extreme weather events
4 Severe commodity price shocks

Thailand

1 Debt crises
2 Cost-of-living crisis
3 Human-made environmental damage
4 Digital inequality
5 Geoeconomic confrontation

Trinidad and Tobago

1 Cost-of-living crisis
2 Digital inequality
3 Severe commodity supply crises
3 Rapid and/or sustained inflation
5 Widespread youth disillusionment

Tunisia

1 Debt crises
2 State collapse
3 Severe commodity supply crises
4 Cost-of-living crisis
5 Rapid and/or sustained inflation

Türkiye

1 Rapid and/or sustained inflation
2 Employment and livelihood crises
3 Interstate conflict
4 Severe commodity supply crises
5 Debt crises
5 Severe commodity price shocks

Ukraine

1 Severe commodity supply crises
2 Interstate conflict
3 Large-scale involuntary migration
3 Failure of cybersecurity measures
5 Automation and displacement of jobs

Risk categories: Economic | Environmental | Geopolitical | Societal | Technological

TABLE B.2 | **Top five risks identified by the Executive Opinion Survey (EOS)**

United Arab Emirates

1	Cost-of-living crisis
2	Rapid and/or sustained inflation
3	Severe commodity price shocks
4	Geopolitical contestation of resources
5	Geoeconomic confrontation
5	Failure of cybersecurity measures

United Kingdom of Great Britain

1	Cost-of-living crisis
2	Debt crises
3	Rapid and/or sustained inflation
4	Failure of climate-change adaptation
5	Terrestrial biodiversity loss and ecosystem collapse
5	Interstate conflict
5	Asset bubble burst

United Republic of Tanzania

1	Rapid and/or sustained inflation
2	Debt crises
3	Employment and livelihood crises
4	Geopolitical contestation of resources
4	Cost-of-living crisis

United States of America

1	Debt crises
2	Rapid and/or sustained inflation
3	Geoeconomic confrontation
4	Cost-of-living crisis
5	Failure of climate-change adaptation

Uruguay

1	Severe commodity price shocks
2	Rapid and/or sustained inflation
3	Prolonged economic stagnation
3	Cost-of-living crisis
5	Automation and displacement of jobs

Venezuela (Bolivarian Republic of)

1	Severe commodity supply crises
2	Collapse of services and public infrastructure
3	State collapse
3	Rapid and/or sustained inflation
5	Geoeconomic confrontation
5	Prolonged economic stagnation
5	Digital inequality

Viet Nam

1	Rapid and/or sustained inflation
2	Infectious diseases
3	Geopolitical contestation of resources
4	Natural disasters and extreme weather events
5	Failure of cybersecurity measures

Yemen

1	Severe commodity supply crises
2	Collapse of services and public infrastructure
3	State collapse
4	Breakdown of critical infrastructure
5	Proliferation of illicit economic activity

Zambia

1	Debt crises
2	Cost-of-living crisis
3	Failure of climate-change adaptation
4	Geopolitical contestation of resources
5	Failure of climate-change mitigation

Zimbabwe

1	Rapid and/or sustained inflation
2	Cost-of-living crisis
3	Geoeconomic confrontation
4	Collapse of services and public infrastructure
5	Severe commodity supply crises

Risk categories: Economic | Environmental | Geopolitical | Societal | Technological

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COMMITTED TO
IMPROVING THE STATE
OF THE WORLD

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LGFA
New Zealand Local Government Funding Agency
Te Pūtea Kāwanatanga ā-rohe

24 February 2023

Dear LGFA Stakeholder

LGFA 2022-23 Half Year Report

Please find attached a copy of the Half Year Report for the six-month period to December 2022. A copy is also available for download on our website www.lgfa.co.nz.

We are pleased to highlight another positive six-month period for LGFA including the following

1. **Increased lending to council and CCO borrowers**
   By 31 December 2022, LGFA had a market value of loans outstanding of $15.75 billion. We lent $1.82 billion over the six-month period which was the second highest amount on record. We added two new councils and two new CCOs to bring the number of member councils to seventy-seven and the number of member CCOs to three.

2. **A focus on sustainability.**
   We launched our Climate Action Loan (CAL) product for council and CCO members in December 2022 that will incentivise borrowers through a lower loan margin if they have a GHG emission reduction plan in place and are meeting the reduction targets.

   We have approved a further three projects as eligible for Green, Social and Sustainable (GSS) loans over the six-month period, bringing the number of eligible projects to five across five councils. Councils receive a discounted borrowing margin for eligible projects.

   Sustainability remains important at LGFA as noted with the CAL product launch and ongoing dialogue with councils relating to GHG emission reporting and reduction.

3. **A financial position tracking to forecast.**
   Net Operating Profit for the six-month period was $1.1 million, which is lower than the comparable prior period but in line with our SOI forecast. We expect a lift in profitability during the next six-month period. LGFA has $18.14 billion of assets and Shareholder Equity of $104.45 million as at 31 December 2022.

4. **Working with our stakeholders.**
   We have been assisting Central and Local Government with the Three Waters Reform programme to ensure a smooth transition of debt from councils to the proposed new Water Services Entities in July 2024.

   We continue to receive the support of our growing investor base. It is pleasing to see the amount of LGFA bonds held by offshore investors grow to a record $5.09 billion as at 31 December 2022 as well as domestic banks, institutional and retail investors increase their holdings. Having a diverse investor base for LGFA bonds helps provide certainty of access to markets for our council and CCO borrowers.

A further highlight was LGFA being voted by market participants as the KangaNews New Zealand Debt Issuer of the Year award for 2022.

Finally, we appreciate the support of all our stakeholders and thank you for your contribution and assistance over the past six months.

Please do not hesitate to contact me if you have any comments or questions.

Kind regards

Mark Butcher
Chief Executive

HALF YEAR REPORT
31 December 2022

Benefiting communities through delivering efficient financing for local government.

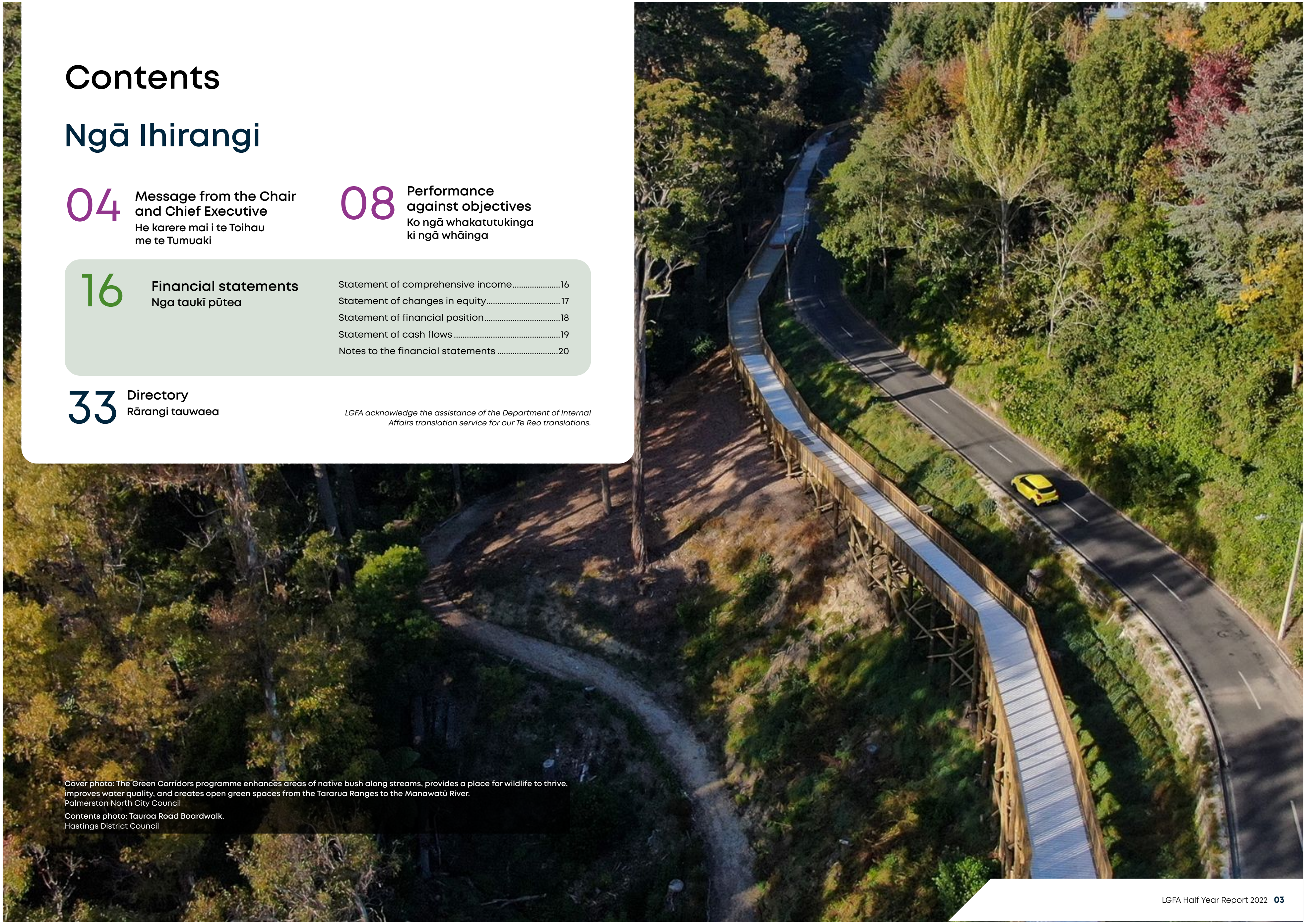
Ka whiwhi painga ngā hapori mā te whakarato pūtea tōtika ki ngā kaunihera.

LGFA
New Zealand Local Government Funding Agency
Te Pūtea Kāwanatanga ā-rohe

Contents

Ngā Ihirangi

LGFA acknowledge the assistance of the Department of Internal Affairs translation service for our Te Reo translations.



Cover photo: The Green Corridors programme enhances areas of native bush along streams, provides a place for wildlife to thrive, improves water quality, and creates open green spaces from the Tararua Ranges to the Manawatū River.
Palmerston North City Council

Contents photo: Tauroa Road Boardwalk.
Hastings District Council

Message from the Chair and Chief Executive

He karere mai i te Toihau me te Tumuaki

For the six-months ended 31 December 2022

The six-months to December presented a challenging period for financial markets, with LGFA's operating performance over this period subdued due to the volatile markets. Despite the difficult conditions, LGFA continued to deliver value to members and our investor base while meeting our financial targets. Highlights over the period included launching our new Climate Action Loan product for members and being awarded the KangaNews New Zealand Debt Issuer of the year.

Financial and Operational Performance

LGFA's total interest income for the six-month period to December 2022 of $312.9 million was a 68.4% increase over the 2021 comparable period ($185.9 million), while net operating profit of $1.1 million for the six-month period decreased 81.3% on the 2021 comparable period ($5.9 million).

Net operating profit was significantly lower than the comparable period a year ago due to the sharp rise in interest rates combined with increased holdings of liquid assets. This outcome was expected and forecast in our Statement of Intent (SOI) last year. Both net interest income and operating profit were slightly ahead of the SOI forecast and we are forecasting an improvement in financial performance in the second half of the financial year.

Expenses have been managed under the SOI budget over the past six months. Lower fees relative to budget for the NZ Debt Management standby facility and lower NZX and legal fees relating to issuance were positive. These savings were offset by higher legal costs relating to considering the implications from the proposed Three Waters Reform, the development of new sustainability initiatives, including related consultancy costs.

The financial strength of LGFA was affirmed by Fitch Ratings who maintained our domestic currency credit rating at AA+ in October 2022. Our AAA rating from S&P Global Ratings was affirmed in March 2022 and remains the same as the New Zealand Government.

Borrowing activity

LGFA issued $1.76 billion of bonds over the past six months and outstandings now total $17.84 billion (including $1.10 billion of treasury stock) across 11 maturities ranging between 2023 to 2037. The average term of our bond issuance during the six months at 4.37 years was significantly shorter than the prior year period.

LGFA has the largest amount of New Zealand dollar (NZD) bonds on issue after the New Zealand Government and our individual bond tranches are amongst the largest and most liquid NZD debt instruments available for investors. Secondary market activity in our bonds continues to rise, assisting investors' access to our bonds throughout the year.

The performance of LGFA bonds over the past six months has been soft with LGFA bond spreads to New Zealand Government Bonds (NZGBs) and spreads to swap in general moving wider in line with global high grade markets. Spreads widened between 3 basis points (bps) and 25 bps to NZGB and between 7 bps to 12 bps to swap over the six-month period. The inclusion of the NZGBs into the World Government Bond Index was also positive for the performance of NZGBs relative to LGFA bonds. Outright yields on LGFA bonds rose between 157 bps (2024 maturity) and 75 bps (2033 maturity) over the six-month period.

LGFA was voted by market participants as the KangaNews New Zealand Debt Issuer of the Year award for 2022 and we want to acknowledge their support.

It is also pleasing to observe the increased participation by offshore investors over the past six months as NZD-denominated investments have become relatively more attractive for investors. We estimate that offshore investors have increased their holdings of LGFA bonds over the past six months by $638 million to a record $5.09 billion (or 30.1% of LGFA bonds on issue), while domestic institutional and retail investors hold 33.2%, domestic banks 28.2% and the Reserve Bank 8.5%.

Lending to the sector

LGFA was established in 2011 to provide long-dated borrowing, certainty of access to markets and to reduce the borrowing costs for the local government sector. The original 31 shareholders including the Crown remain as shareholders. Over the past six months, we added two councils and two Council-controlled organisations (CCOs) as members, with Dunedin City Council and Environment Southland joining as guarantors and Westland Holdings and Dunedin City Treasury joining as CCOs. Total membership is now 77 out of the 78 councils in New Zealand and three CCOs.

Long-dated lending to council and CCO members over the six-month period was $1.82 billion provided to 51 members. This was the second highest amount lent over a rolling six-month period and was just below the amount of loans made during the six-month period to September 2020. Our estimated market share of total council borrowing of 89% was above forecast and the third highest annual average on record. The average tenor of long-dated borrowing by councils of 5.6 years over the six-month period was in line with prior periods.

Short-dated lending for terms less than 12 months continues to be supported by councils. As at 31 December 2022, LGFA had $493 million of short-term loans outstanding to 30 council and CCO members.

Our role in assisting Local and Central Government

The local government sector continues to face a period of change and uncertainty having to deal with climate-related events, rising cost pressures and the Central Government-led initiatives relating to the proposed Three Waters Reform Programme and the Future for Local Government Review.

LGFA is assisting on an as-required basis, both Central Government and our council members, as they work through the proposed Three Waters Reform Programme. The Government's proposed Three Water Reform Programme will be the largest change to the local authority sector in recent years.

LGFA continues to assist the local government sector-led initiative in developing a Ratepayer Financing Scheme that may provide some financial relief to ratepayers.

New Zealand Issuer of the Year for 2022

KANGANEWS AWARDS 2022

Thank you to our investors, intermediaries and market participants for their support.

New products and initiatives

We launched Green, Social and Sustainable (GSS) lending in October 2021 and over the past six months have approved three further projects as being eligible for GSS loans, bringing the number to five loans across five councils. As at 31 December 2022 we have undertaken $101 million of GSS Loans to three councils.

We launched Climate Action Loans (CALs) for councils and CCOs in December 2022. A CAL provides a discounted loan margin to those councils with a Greenhouse Gas Emission Reduction Plan in place and who are meeting their targets.

Increasing focus on sustainability

Sustainability plays an important part within the local government sector and at LGFA. We have undertaken several initiatives over the past year, including maintenance of CarbonZero certification from Toitu Envirocare, actively marketing our GSS loan product and establishing CALs.

We reviewed the Climate Change Emergency Declarations and responses by Councils and a copy of the report is available on our website: **Review of Climate Emergency Declarations and Responses by Councils**

Acknowledgments

The Agency's work cannot be implemented without the support of our staff, fellow directors, Shareholders Council, New Zealand Debt Management (NZDM) and Central Government, all of whose efforts should be acknowledged.

John Avery, one of LGFA's foundation directors, retired in November 2022, and we would like to take this opportunity to sincerely thank John for his invaluable contribution to LGFA since 2011.

We believe LGFA's future remains positive and look forward to working with all stakeholders.

Craig Stobo
Chair

Mark Butcher
Chief Executive

Pedestrian bridge, Waikanae River, Otaihanga Domain.
Kapiti Coast District Council. Photo by Mark Coote

Performance against objectives

Ko ngā whakatutukinga ki ngā whāinga

The statement of service performance provides a summary of LGFA's performance for the first half of the financial year against the objectives and performance targets set out in the LGFA Statement of Intent 2022-23 (SOI)

2022-23 Objectives and performance targets

LGFA objectives and performance targets for 2022-23 fall within the following five strategic priorities which encompass our shareholders' foundation objectives and guide the LGFA Board and management in determining our strategy:

- Governance, capability and business practice
- Optimising financing services for local government
- Environmental and social responsibility
- Effective management of loans
- Industry leadership and engagement

Our quarterly reports to shareholders provide more detail on our performance against objectives and performance targets. The reports for the quarters' ended September and December 2022 are available on the LGFA website.

Governance, capability and business practice

LGFA is committed to best practice corporate governance to ensure its long-term sustainability and success.

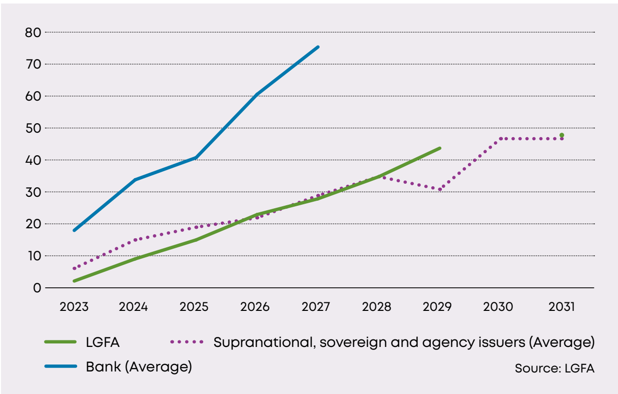
Objectives	Our performance to 31 December 2022
Demonstrate best practice corporate governance.	LGFA is committed to demonstrating best practice corporate governance and we report annually on our compliance with the eight core principles underpinning the NZX Corporate Governance Best Practice Code. Our 2022 Annual Report, released on 30 August 2022, is the most recent report with commentary on our compliance with the NZX Code.
Set and model high standards of ethical behaviour.	LGFA has adopted a formal Code of Ethics, incorporating its Conflicts of Interest and Code of Conduct policies, which sets out the standards and values that directors and employees are expected to follow.
Ensure products and services offered to participating borrowers are delivered in a cost-effective manner.	LGFA prepares annual operating budgets and monitors progress against these monthly. Our performance against our financial performance targets for the six months to 31 December is summarised below under our performance targets.
Be a good employer by providing safe working conditions, training and development and equal opportunities for staff.	LGFA is committed to being a good employer and we report our employment practices annually in our Annual Report. Our 2022 Annual Report is our most recent report outlining our health and safety and wellbeing practices and policies, including compliance with the Health and Safety at Work Act, diversity and inclusion and capability and development.

Performance targets	2022-2023 target	Our performance to 31 December 2022
Comply with the Shareholder Foundation Polices and the Board-approved Treasury Policy at all times.	No breaches.	✓ No breaches.
Maintain LGFA's credit rating equal to the New Zealand Government sovereign rating where both entities are rated by the same Rating Agency.	LGFA credit ratings equivalent to NZ Sovereign.	✓ Our ratings remain equivalent to the New Zealand Government for both S&P Global Ratings and Fitch Ratings. Fitch Ratings upgraded our long-term foreign currency credit rating to AA+ on 16 September 2022. S&P Global Ratings affirmed our domestic currency credit rating at AAA in February 2022.
LGFA's total operating income for the period to 30 June 2023.	> $12.2 million.	✓ On target to meet by 30 June 2023. $5.651 million as at 31 December 2022.
LGFA's total operating expenses for the period to 30 June 2023.	< $9.4 million.	✓ On target to meet by 30 June 2023. $4.542 million as at 31 December 2022.

Optimising financing services for local government

LGFA's primary objective is to optimise the terms and conditions of the debt funding it provides to participating borrowers. Amongst other things, LGFA will achieve this by delivering operational best practice and efficiency across our lending products and services.

Objectives	How we measure our performance
Provide interest cost savings relative to alternative sources of financing.	**Comparison to other high-grade issuers - secondary market spread to swap (bps)**



Supranational, sovereign and agency issuers

Kainga Ora (AAA)	KBN (AAA)
Asian Development Bank (AAA)	Rentenbank (AAA)
IADB (AAA)	World Bank (AAA)
International Finance Corp (AAA)	Nordic Investment Bank (AAA)

Banks

BNZ (AA-)	Westpac Bank (AA-)

Objectives	How we measure our performance
Offer flexible short and long-term lending products that meet the borrowing requirements for borrowers.	LGFA provides members with short term loans (less than one year), long term loans on either a floating or fixed rate basis (between one year and April 2037), Green Social and Sustainable Loans and standby facilities. • Over the six months to 31 December 2022, our members borrowed $1.82 billion in 163 long term loans across maturity dates ranging between 2023 and 2033, with December quarter lending being the second highest on record. • As at 31 December 2022 there were 45 short term loans totaling $497 million. • As at 31 December 2022, standby facilities totalled $682 million across 13 members.
Deliver operational best practice and efficiency for lending services.	Over the six months to 31 December 2022, LGFA operations staff successfully: • settled 842 new trades with a gross value of $9.97 billion, • processed 6,067 cash flows with a gross value of $15.0 billion, and • rate set 4,305 existing trades. There were no LGFA settlement errors over the six months.
Ensure certainty of access to debt markets, subject always to operating in accordance with sound business practice.	There was strong activity in LGFA bonds in both the primary market (tender or syndicated issuance) and secondary market (between banks and investors). Over the six months to 31 December 2022, we issued $1.76 billion of primary bonds and secondary market turnover totalled $5.14 billion. Secondary market turnover of $3.1 billion over the December quarter was at the second highest on record.

Performance targets	2022-2023 target	Our performance to 31 December 2022
Share of aggregate long-term debt funding to the Local Government sector.	> 80%	✓ 89% as at 31 December 2022 (compared to a historical average of 75% since 2012).
Total lending to Participating Borrowers.	> $15,004 million	✓ On target to meet by 30 June 2023. $15,751 million as at 31 December 2022.
Conduct an annual survey of Participating Borrowers who borrow from LGFA as to the value added by LGFA to the borrowing activities.	> 85% satisfaction score	✓ 100% satisfaction score in August 2022 Stakeholder Survey.
Successfully refinance existing loans to councils and LGFA bond maturities as they fall due.	100%	✓ 100%
Meet all lending requests from Participating Borrowers, where those requests meet LGFA operational and covenant requirements.	100%	✓ 100%

Waikato riverpath.
Hamilton City Council

Environmental and social responsibility

LGFA recognises the risks inherent in climate change for councils and supports New Zealand's shift to a low-carbon economy. LGFA will exhibit a sense of social and environmental responsibility by having regard to the interests of the community in which it operates and by endeavouring to accommodate or encourage these when able to do so.

Objectives	How we measure our performance
Assist the local government sector in achieving their sustainability and climate change objectives.	Over the six months, we approved GSS loans to Hutt City Council for the Naenae swimming pool, Whangarei District Council for the Civic Centre, and approved our first eligible project for social lending for Christchurch City Council's Ōtautahi Community Housing Trust. In total, to date we have approved five GSS loans with a combined approved value of $543 million, with $101 million of loans drawn down to date. On 1 December 2022, we launched Climate Action Loans (CALs) which provides councils with a discounted loan margin if they have implemented a Greenhouse Gas Emission Reduction Plan and meet their emission reduction targets. LGFA completed research on which New Zealand councils declared a climate emergency over 2019-2020 (16 out of 78), their subsequent responses and any opportunities for LGFA. A copy of our report is available from our website: **Review of Climate Emergency Declarations and Responses by Councils**
Improve sustainability outcomes within LGFA.	In 2021, LGFA directors committed to reducing our carbon emissions over time, with our target of cutting per employee emissions by 30% by 2030, compared with a 2018/19 base year. We are currently working on translating this target into annual carbon reduction plan targets.

Performance targets	2022-2023 target	Our performance to 31 December 2022
Comply with the Health and Safety at Work Act 2015.	No breaches	✔ No breaches.
Maintain Toitū Carbon Zero certification.	Carbon-zero certification maintained.	✔ Toitū Net Carbon-zero recertification approved 11 October 2022.
Meet reduction targets outlined in our carbon reduction management plan.	Reduction targets met.	✘ We are currently working on translating this target into annual carbon reduction plan targets.
Increase our GSS lending book.	Two new participating borrowers enter into GSS loans.	✔ Three new participating borrowers approved for GSS lending.
Ensure Annual Report is prepared in compliance with applicable GRI Standards.	100%	✔ 2022 Annual Report prepared to meet the requirements of the Global Reporting Initiative (GRI) Standards (core option).
Meet all mandatory climate reporting standards.	100%	✔ Voluntarily comply with GRI standards (core option). Undertaking development work on meeting Climate Related Disclosure requirements.

Effective management of loans

LGFA will ensure its loan book remains at a high standard by ensuring it understands each participating borrower's financial position. LGFA manages its assets within an appropriate risk management framework to ensure shareholder value is not compromised.

Objectives	How we measure our performance
Proactively monitor and review each Participating Borrower's financial position, including its financial headroom under LGFA policies. Analyse finances at the Council group level where appropriate and report to shareholders.	Over the six months, we reviewed council agendas and management reports on an ongoing basis for all members on the LGFA borrower watch-list. We have received compliance certificates for LGFA covenants from all of our members with debt outstanding at June 2022 and no council has requested that they be measured on a group basis. Some certificates have been provided based upon unaudited financial statements given the delays in providing final audit signoff due to audit shortages.
Endeavour to meet each participating borrower annually, including meeting with elected officials as required, or if requested.	We met with 30 borrowers over the six months and are on target to meet with all members by 30 June 2023.

Performance targets	2022-2023 target	Our performance to 31 December 2022
Review each participating borrower's financial position under LGFA policies.	100%	✔ On target to meet by 30 June 2023.
Arrange to meet each Participating Borrower at least annually, including meeting with elected officials as required, or if requested.	100%	✔ On target to meet by 30 June 2023.

Industry leadership and engagement

LGFA will take a proactive role to enhance the financial strength and depth of the local government debt market and will work with key central government and local government stakeholders on sector issues.

Objectives	How we measure our performance
Take a proactive role to enhance the financial strength and depth of the local government debt market and work with key central government and local government stakeholders on sector and individual council issues.	This year we have introduced two new webinars for members: • LGFA Quarterly Update • An Economic and Financial Market Update by BNZ These inaugural webinars were well attended by participants and will be formalised as ongoing quarterly events.
Assist the local government sector with significant matters such as COVID-19 response and the proposed Three Waters Reform Programme.	Over the six months we met with Treasury, the National Transition Unit and Policy teams at DIA (and their advisers) regarding proposed Three Waters Reform, working actively on issues relating how to the transition of council debt on 1 July 2024, as well as the borrowing options for the Water Services Entities (WSEs) following transition. The Water Services Legislation Bill was introduced to Parliament in December and, in consultation with key stakeholders, we are considering the contents of the Bill and what potential role LGFA could play under the proposed Three Waters Reform Programme.
Support councils and CCOs in the development of reporting disclosures of the impacts of sector activity on climate change.	LGFA has provided input into the Ratepayer Financing Scheme (RFS) project managed by a group of councils with advice from Cameron Partners. If successful, the RFS could offer temporary financial relief to ratepayers via rates postponement. LGFA is not contributing financially to this project but providing intellectual capital and assistance. We are continuing work on initiatives to reduce compliance and documentation requirements for members when they borrow. Met with Chair of the Review into the Future for Local Government.

Bay of Plenty Regional Oil Spill Response Team training exercise in Tauranga Harbour.
Bay of Plenty Regional Council

Financial statements

Nga taukī pūtea

Statement of comprehensive income

For the six months ended 31 December 2022 in $000s

	Note	Unaudited six months ended 31 December 2022	Unaudited six months ended 31 December 2021
Interest income		312,883	185,886
Interest expense		307,904	176,709
Net interest income	**4**	**4,979**	**9,178**
Other operating income	5	671	526
Total operating income		**5,651**	**9,704**
Operating expenses	6	4,542	3,769
Net operating profit		**1,108**	**5,935**
Total comprehensive income		**1,108**	**5,935**

These statements are to be read in conjunction with the notes to the financial statements.

Due to rounding, numbers presented in the financial statements and associated notes may not add up precisely to the reported totals.

The Board of Directors of the New Zealand Local Government Funding Agency Limited authorised these statements or issue on 24 February 2023.

Statement of changes in equity

For the six months ended 31 December 2022 in $000s

	Note	Share capital	Retained earnings	Total equity
Equity as at 1 July 2021		**25,000**	**69,744**	**94,744**
Net operating profit			10,673	10,673
Total comprehensive income for the year			10,673	10,673
Transactions with owners			-	-
Dividend paid on 3 September 2021			(857)	(857)
Equity as at 1 July 2022		**25,000**	**79,559**	**104,560**
Net operating profit			1,108	1,108
Total comprehensive income for the year			1,108	1,108
Transactions with owners			-	-
Dividend paid on 2 September 2022			(1,218)	(1,218)
Unaudited closing balance as at 31 December 2022	**17**	**25,000**	**79,450**	**104,450**

Craig Stobo, Director
Board Chair

Linda Robertson, Director
Chair, Audit and Risk Committee

Statement of financial position

As at 31 December 2022 in $000s

	Note	Unaudited as at 31 December 2022	Audited as at 30 June 2022
Assets			
Financial assets			
Receivables		1,895	360
Cash and bank balances		64,921	158,033
Cash pledged as collateral		337,009	76
Marketable securities		1,312,958	1,491,148
Deposits		594,359	462,866
Derivatives in gain		77,470	94,767
Loans	8	15,751,420	14,041,908
Non-financial assets			
Prepayments		1,150	852
Other assets	9	112	156
Total assets		**18,141,294**	**16,250,167**
Equity			
Share capital	16	25,000	25,000
Retained earnings		79,450	79,560
Total equity		**104,450**	**104,560**
Liabilities			
Financial liabilities			
Payables and provisions	10	95,576	45,066
Bills	11	636,949	562,803
Bond repurchases	12	108,077	31,671
Derivatives in loss		1,717,879	1,206,175
Bonds	13	15,146,187	14,015,862
Borrower notes	14	331,468	283,180
Non-financial liabilities			
Other liabilities	15	708	850
Total liabilities		**18,036,844**	**16,145,607**
Total equity and liabilities		**18,141,294**	**16,250,167**

These statements are to be read in conjunction with the notes to the financial statements.

Statement of cash flows

For the six months ended 31 December 2022 in $000s

	Note	Unaudited six months ended 31 December 2022	Unaudited six months ended 31 December 2021
Cash Flow from Operating Activities			
Cash applied to loans	8	(1,639,024)	(1,427,636)
Interest paid on bonds issued		(228,725)	(215,363)
Interest paid on bills issued		(10,088)	(1,591)
Interest paid on borrower notes		(131)	(212)
Interest paid on bond repurchases		(1,738)	(254)
Interest received from loans		224,165	76,952
Interest received from cash & cash equivalents		2,396	1,031
Interest received from marketable securities		13,570	5,624
Interest received from deposits		5,897	2,206
Net interest on derivatives		2,276	136,753
Cash proceeds from provision of standby facilities		671	526
Payments to suppliers and employees		(5,317)	(3,927)
Net cash flow from operating activities	**18**	**(1,636,047)**	**(1,425,888)**
Cashflow from Investing Activities			
Purchase of marketable securities		206,657	(594,958)
(Purchase)/maturity of deposits		(462,937)	(185,743)
Purchase of plant and equipment		-	-
Net Cashflow from Investing Activities		**(256,280)**	**(780,701)**
Cash flows from financing activities			
Cash proceeds from bonds issued	13	1,477,890	2,096,802
Cash proceeds (outflows) from bills issued		74,146	(75,367)
Cash proceeds (outflows) from bond repurchases		76,195	158,143
Cash proceeds from borrower notes		41,598	35,509
Dividends paid		(1,218)	(857)
Cash applied to derivatives		130,604	(25,240)
Net cash flows from financing activities		**1,799,215**	**2,188,991**
Net (Decrease) / Increase in Cash		(93,112)	(17,599)
Cash, cash equivalents at beginning of year		158,033	391,835
Cash, cash equivalents at end of year		**64,921**	**374,236**

These statements are to be read in conjunction with the notes to the financial statements.

Notes to the financial statements

1. Reporting entity

The New Zealand Local Government Funding Agency Limited (LGFA) is a company registered under the Companies Act 1993 and is subject to the requirements of the Local Government Act 2002.

LGFA is controlled by participating local authorities and is a council-controlled organisation as defined under section 6 of the Local Government Act 2002. LGFA is a limited liability company incorporated and domiciled in New Zealand.

The primary objective of LGFA is to optimise the debt funding terms and conditions for participating borrowers.

The registered address of LGFA is Level 8, City Chambers, 142 Featherston Street, Wellington Central, Wellington 6011.

These financial statements were authorised for issue by the Directors on 24 February 2023.

2. Statement of compliance

The interim financial statements are for the six months ended 31 December 2022 and are to be read in conjunction with the annual report for the year ended 30 June 2021.

The financial statements have been prepared in accordance with New Zealand Generally Accepted Accounting Practice (NZ GAAP) and in compliance with NZ IAS 34 Interim Financial Reporting.

3. Basis of preparation

Measurement base

The financial statements have been prepared on a historical cost basis modified by the revaluation of certain assets and liabilities.

The financial statements are prepared on an accrual basis.

Functional and presentation currency

The financial statements are presented in New Zealand dollars rounded to the nearest thousand, unless separately identified. The functional currency of LGFA is New Zealand dollars.

Foreign currency conversions

Transactions denominated in foreign currency are translated into New Zealand dollars using exchange rates applied on the trade date of the transaction.

Changes in accounting policies

There have no changes to accounting policies.

Early adoption standards and interpretations

LGFA has not early adopted any standards.

Standards not yet adopted

LGFA does not consider any standards or interpretations in issue but not yet effective to have a significant impact on its financial statements.

Financial instruments

Financial assets

Financial assets, other than derivatives, are recognised initially at fair value plus transaction costs and subsequently measured at amortised cost using the effective interest rate method.

Cash and cash equivalents include cash on hand, bank accounts and deposits with an original maturity of no more than three months.

Cash provided by LGFA as security for financial arrangements remains a financial asset of LGFA and is recognised as cash pledged as collateral in the Statement of Financial Position, separate from cash and cash equivalents

Purchases and sales of all financial assets are accounted for at trade date.

At each balance date, an expected credit loss assessment is performed for all financial assets and is calculated as either:

- Credit losses that may arise from default events that are possible within the next 12 months, where no significant increase in credit risk has arisen since acquisition of the asset, or
- Credit losses that may arise from default events that are possible over the expected life of the financial asset, where a significant increase in credit risk has arisen since acquisition of the asset.

Impairment losses on financial assets will ordinarily be recognised on initial recognition as a 12-month expected loss allowance and move to a lifetime expected loss allowance if there is a significant deterioration in credit risk since acquisition.

Financial liabilities

Financial liabilities, other than derivatives, are recognised initially at fair value less transaction costs and subsequently measured at amortised cost using the effective interest rate method.

Derivatives

Derivative financial instruments are recognised both initially and subsequently at fair value. They are reported as either assets or liabilities depending on whether the derivative is in a net gain or net loss position respectively.

Fair value hedge

Where a derivative qualifies as a hedge of the exposure to changes in fair value of an asset or liability (fair value hedge) any gain or loss on the derivative is recognised in profit and loss together with any changes in the fair value of the hedged asset or liability.

The carrying amount of the hedged item is adjusted by the fair value gain or loss on the hedged item in respect of the risk being hedged. Effective parts of the hedge are recognised in the same area of profit and loss as the hedged item.

Other assets

Property, plant and equipment

Items of property, plant and equipment are initially recorded at cost.

Depreciation is charged on a straight-line basis at rates calculated to allocate the cost or valuation of an item of property, plant and equipment, less any estimated residual value, over its remaining useful life.

Intangible assets

Intangible assets comprise software and project costs incurred for the implementation of the treasury management system. Capitalised computer software costs are amortised on a straight-line basis over the estimated useful life of the software (three to seven years). Costs associated with maintaining computer software are recognised as expenses.

Other liabilities

Employee entitlements

Employee entitlements to salaries and wages, annual leave and other similar benefits are recognised in the profit and loss when they accrue to employees.

Revenue

Interest income

Interest income is accrued using the effective interest rate method.

The effective interest rate exactly discounts estimated future cash receipts through the expected life of the financial asset to that asset's net carrying amount. The method applies this rate to the principal outstanding to determine interest income each period.

Expenses

Expenses are recognised in the period to which they relate.

Interest expense

Interest expense is accrued using the effective interest rate method.

The effective interest rate exactly discounts estimated future cash payments through the expected life of the financial liability to that liability's net carrying amount. The method applies this rate to the principal outstanding to determine interest expense each period.

Income tax

LGFA is exempt from income tax under Section 14 of the Local Government Borrowing Act 2011.

Goods and services tax

All items in the financial statements are presented exclusive of goods and service tax (GST), except for receivables and payables, which are presented on a GST-inclusive basis. Where GST is not recoverable as input tax, then it is recognised as part of the related asset or expense.

The net amount of GST recoverable from, or payable to, the IRD is included as part of receivables or payables in the statement of financial position.

The net GST paid to, or received from the IRD, including the GST relating to investing and financing activities, is classified as a net operating cash flow in the statement of cash flows.

Commitments and contingencies are disclosed exclusive of GST.

Segment reporting

LGFA operates in one segment being funding of participating borrowers in New Zealand.

Judgements and estimations

The preparation of these financial statements requires judgements, estimates and assumptions that affect the application of policies and reported amounts. For example, the fair value of financial instruments depends critically on judgements regarding future cash flows, including inflation assumptions and the risk-free discount rate.

The estimates and associated assumptions are based on historical experience and various other factors that are believed to be reasonable under the circumstances. Actual results may differ from these estimates and these estimates and underlying assumptions are reviewed on an ongoing basis. Where these judgements significantly affect the amounts recognised in the financial statements they are described in the following notes.

The financial statements as at 31 December 2022 include estimates and judgements of the proposed Three Waters Reform Programme on LGFA's financial position and performance. Whilst there has been no material impact on the estimates and judgements at the date these financial statements are authorised, it is noted that there is significant uncertainty with regards to the medium and long-term effects of COVID-19, as well as the outcome of proposed Three Waters Reform Programme on the local government sector.

4. Net interest income

in $000s	Unaudited six months ended 31 December 2022	Unaudited six months ended 31 December 2021
Interest income		
Cash and cash equivalents	4,098	1,036
Marketable securities	18,342	4,259
Lease liability	16	-
Deposits	9,668	3,129
Derivatives	-	90,015
Loans	280,759	87,447
Fair value hedge ineffectiveness	-	-
Total interest income	**312,883**	**185,886**
Interest expense		
Bills	10,088	1,591
Bond repurchase transactions	1,949	319
Lease liability	-	5
Derivatives	66,245	-
Bonds	224,425	173,439
Borrower notes	5,196	1,355
Total interest expense	**307,904**	**176,709**
Net interest income	**4,979**	**9,178**

5. Other operating income

As at 30 June 2022, LGFA had provided credit standby facilities totalling $662 million to selected councils. As at balance date, there were no drawdowns outstanding under the facilities.

in $000s	Unaudited six months ended 31 December 2022	Unaudited six months ended 31 December 2021
Standby facilities fee income	671	526
Total other operating income	**671**	**526**

6. Operating expenses

Issuance and on-lending expenses are those costs that are incurred as a necessary expense to facilitate the ongoing issuance of LGFA debt securities.

in $000s	Unaudited six months ended 31 December 2022	Unaudited six months ended 31 December 2021
Issuance and on-lending expenses		
Approved issuer levy [1]	343	325
Rating agency fees	333	324
NZDM facility fee	652	250
Legal fees - issuance	205	225
NZX	367	390
Trustee fees	55	51
Regulatory, registry, other fees	106	68
	2,062	**1,633**
Other operating expenses		
Information technology	341	399
Consultants	127	95
Directors fees	213	212
Insurance	47	43
Legal fees	156	51
Other expenses	230	136
Auditors' remuneration		
Statutory audit	55	55
Advisory services	-	-
Personnel	1,312	1,145
	2,481	**2,135**
Total operating expenses	**4,542**	**3,769**

1. The amount of Approved Issuer Levy is a function of the number of the offshore holders of certain LGFA bond maturities.

7. Hedge accounting

LGFA is exposed to interest rate risk from its borrowing, lending and investment activities and uses interest rate swaps to manage this risk. For hedge accounting purposes, LGFA has designated these swaps in fair value relationships to its fixed rate borrowings, loans and investments.

The following table shows the gain or loss on the hedging instrument and the hedged item attributable to the hedged risk for fair value hedge relationships.

in $000s	Unaudited six months ended 31 December 2022	Unaudited six months ended 31 December 2021
Hedging instruments - interest rate swaps	329,876	520,010
Hedged items attributable to the hedged risk	(329,876)	(520,010)
Ineffectiveness recognised in profit or loss from fair value hedges	**-**	**-**

The gains or losses on the hedging instrument (interest rate swaps) and the hedged item (bonds, loans and investments) are mapped to the same fair value account. For this reason, the statement of comprehensive income will only report any ineffectiveness arising from the fair value hedge.

8. Loans

in $000s	Unaudited as at 31 December 2022		Audited as at 30 June 2022	
	Short-term loans [1]	Loans	Short-term loans	Loans
Ashburton District Council	7,064	79,152	12,048	78,898
Auckland Council	-	3,629,211	-	3,413,415
Bay of Plenty Regional Council	25,465	167,970	25,651	167,941
Buller District Council	-	20,027	-	20,015
Canterbury Regional Council	-	75,366	4,018	75,214
Carterton District Council	-	14,772	-	14,762
Central Hawkes Bay District Council	1,011	28,168	2,024	20,107
Central Otago District Council	10,083	5,050	5,024	-
Christchurch City Council	-	2,285,660	2,017	2,036,724
Clutha District Council	7,547	37,590	5,532	32,394
Far North District Council	-	71,895	-	71,822
Gisborne District Council	-	111,572	-	86,095
Gore District Council	8,573	35,263	6,035	29,631
Greater Wellington Regional Council	-	636,734	-	576,343
Grey District Council	3,944	26,781	3,980	26,717
Hamilton City Council	-	726,508	-	633,049
Hastings District Council	-	275,067	-	237,990
Hauraki District Council	-	52,432	-	43,212
Hawkes Bay Regional Council	-	46,141	-	37,992
Horizons Regional Council	11,942	49,831	11,984	49,771
Horowhenua District Council	21,187	131,653	11,001	127,395
Hurunui District Council	8,073	34,307	8,033	30,147
Hutt City Council	-	303,302	-	256,607
Invercargill City Council	36,004	68,763	12,845	68,725
Invercargill City Holdings Ltd	18,469	68,438	22,076	68,354
Kaikoura District Council	-	5,341	-	5,331
Kaipara District Council	-	44,425	-	44,229
Kapiti Coast District Council	-	257,151	-	256,128
Kawerau District Council	-	2,005	-	-
Mackenzie District Council	2,018	8,080	10,002	-
Manawatu District Council	11,570	77,919	11,559	77,725
Marlborough District Council	47,553	107,324	37,325	100,289
Masterton District Council	-	56,244	-	50,260
Matamata-Piako District Council	-	45,907	-	38,191
Nelson City Council	-	171,371	-	140,581
New Plymouth District Council	10,084	216,117	-	170,350
Northland Regional Council	-	14,148	-	14,147
Opotiki District Council	-	9,067	-	7,073

1. As at 31 December 2022, $2,415 million of loans are due to mature within 12 months. This comprises all short-term loans and $1,922 million of loans.

in $000s	Unaudited as at 31 December 2022		Audited as at 30 June 2022	
	Short-term loans [1]	Loans	Short-term loans	Loans
Otago Regional Council	26,793	73,682	66,715	48,443
Otorohanga District Council	-	4,028	-	4,028
Palmerston North City Council	-	213,980	-	187,872
Porirua City Council	-	178,148	-	172,335
Queenstown Lakes District Council	55,703	401,978	50,275	241,015
Rangitikei District Council	-	19,158	-	19,157
Rotorua District Council	53,600	275,679	43,112	245,298
Ruapehu District Council	8,037	29,588	8,020	29,557
Selwyn District Council	-	85,725	-	75,343
South Taranaki District Council	-	113,060	-	112,566
South Waikato District Council	4,954	34,294	4,874	34,171
Southland District Council	-	16,900	-	16,899
South Wairarapa District Council	-	26,631	-	26,537
Stratford District Council	-	32,359	6,027	26,299
Taranaki Regional Council	3,963	19,632	-	14,587
Tararua District Council	2,013	55,670	-	51,244
Tasman District Council	24,295	235,580	24,193	198,190
Taupo District Council	-	171,208	-	125,522
Tauranga City Council	-	761,621	-	648,528
Thames-Coromandel District Council	-	73,665	-	73,365
Timaru District Council	29,108	152,022	28,724	136,516
Upper Hutt City Council	-	95,766	-	91,421
Waikato District Council	-	110,947	-	95,454
Waikato Regional Council	-	25,202	-	25,120
Waimakariri District Council	-	171,473	-	170,903
Waimate District Council	-	3,534	-	-
Waipa District Council	26,030	154,231	25,530	124,377
Wairoa District Council	-	11,102	-	10,062
Waitaki District Council (WD)	6,903	31,201	4,491	20,583
Waitomo District Council	4,027	24,160	4,017	24,092
Wellington City Council	-	1,195,968	-	967,101
West Coast Regional Council	-	11,396	3,761	6,616
Western Bay Of Plenty District Council	-	70,687	-	70,366
Westland District Council	-	30,050	-	29,933
Westland Holdings Ltd	-	2,405	-	-
Whakatane District Council	-	108,433	-	86,396
Whanganui District Council	7,544	99,907	7,523	99,522
Whangarei District Council	9,947	183,505	9,972	182,813
Fair value hedge adjustment	-	(43,416)	-	(36,332)
Total loans	**493,505**	**15,257,915**	**478,385**	**13,563,522**

9 . Other assets

in $000s	Unaudited as at 31 December 2022	Audited as at 30 June 2022
Right-of-use lease asset	112	156
Total other assets	**112**	**156**

10. Payables and provisions

in $000s	Unaudited as at 31 December 2022	Audited as at 30 June 2022
Loans/purchases to be advanced	95,000	44,000
Trade creditors	185	800
Credit provision	139	161
Other provisions	252	105
Total payables and provisions	**95,576**	**45,066**

11. Bills

Unaudited as at 31 December 2022 in $000s	Face value	Unamortised premium	Accrued interest	Total
13 January 2023	145,000	(139)	-	144,861
2 February 2023	25,000	(78)	-	24,922
10 February 2023	80,000	(337)	-	79,663
17 February 2023	20,000	(107)	-	19,893
28 February 2023	50,000	(348)	-	49,652
10 March 2023	70,000	(538)	-	69,462
15 March 2023	50,000	(436)	-	49,564
20 March 2023	52,000	(504)	-	51,496
5 April 2023	25,000	(265)	-	24,735
12 April 2023	20,000	(234)	-	19,766
18 April 2023	15,000	(191)	-	14,809
10 May 2023	15,000	(245)	-	14,755
7 June 2023	25,000	(522)	-	24,478
14 June 2023	50,000	(1,106)	-	48,894
Total bills	**642,000**	**(5,051)**	**-**	**636,949**

Audited as at 30 June 2022 in $000s	Face value	Unamortised premium	Accrued interest	Total
7 July 2022	15,000	-	(4)	14,996
13 July 2022	70,000	-	(30)	69,970
19 July 2022	35,000	-	(33)	34,967
4 August 2022	25,000	-	(33)	24,967
10 August 2022	80,000	-	(167)	79,833
19 August 2022	20,000	-	(60)	19,940
30 August 2022	50,000	-	(201)	49,799
9 September 2022	68,000	-	(296)	67,704
14 September 2022	100,000	-	(538)	99,462
19 September 2022	27,000	-	(120)	26,880
6 October 2022	25,000	-	(148)	24,852
9 November 2022	25,000	-	(238)	24,762
7 December 2022	25,000	-	(329)	24,671
Total bills	**565,000**	**-**	**(2,197)**	**562,803**

12. Treasury stock and bond repurchases

Periodically, LGFA subscribes for LGFA bonds as part of its tender process and holds these bonds as treasury stock. LGFA bonds held by LGFA as treasury stock are derecognised at the time of issue and no liability is recognised in the statement of financial position. As at 31 December 2022, $1,100 million of LFGA bonds had been subscribed as treasury stock.

LGFA makes these treasury stock bonds available to banks authorised as its tender counterparties to borrow under short-term repurchase transactions. The objective of the bond lending facility is to assist with improving secondary market liquidity in LGFA bonds. Bonds lent to counterparties are disclosed as a separate stock lending liability on the face of the statement of financial position.

in $000s	Unaudited as at 31 December 2022	Audited as at 30 June 2022
15 April 2023	4,054	
15 April 2024	-	1,456
15 April 2025	9,512	6,773
15 April 2026	893	5,395
15 April 2027	35,962	-
15 May 2028	-	-
20 April 2029	15,416	7,390
15 May 2031	8,223	-
14 April 2033	-	4,566
15 May 2035	-	818
15 April 2037	34,017	5,272
Total bond repurchases	**108,077**	**31,671**

13. Bonds

Bonds on issue do not include $1,100 million face value of issued LGFA bonds subscribed by LGFA and held as treasury stock. Refer Note 12: Treasury stock and bond repurchase transactions.

Unaudited as at 31 December 2022 in $000s	Face Value	Unamortised premium	Accrued interest	Fair value hedge adjustment	Total
Fixed interest bonds					
15 April 2023	1,830,000	9,127	21,568		
15 April 2024	2,108,000	862	10,164		
15 April 2025	2,409,000	(45,646)	14,196		
15 April 2026	2,055,000	(52,395)	6,605		
15 April 2027	1,881,000	78,421	18,138		
15 May 2028	1,373,000	(59,559)	4,011		
20 April 2029	1,562,000	(60,236)	4,699		
15 May 2031	1,000,000	(42,471)	2,921		
14 April 2033	1,350,000	34,731	10,255		
15 May 2035	400,000	2,096	1,558		
15 April 2037	770,000	(25,117)	3,300		
Total bonds	**16,738,000**	**(160,188)**	**97,415**	**(1,529,039)**	**15,146,187**

Audited as at 30 June 2022 in $000s	Face Value	Unamortised premium	Accrued interest	Fair value hedge adjustment	Total
Fixed interest bonds					
15 April 2023	1,830,000	25,117	21,175		
15 April 2024	1,998,000	5,625	9,458		
15 April 2025	1,679,000	(13,379)	9,714		
15 April 2026	1,815,000	(31,599)	5,728		
15 April 2027	1,751,000	85,460	16,577		
15 May 2028	1,270,000	(53,384)	3,650		
20 April 2029	1,362,000	(21,893)	4,019		
15 May 2031	850,000	(19,801)	2,443		
14 April 2033	1,290,000	43,486	9,622		
15 May 2035	400,000	2,166	1,533		
15 April 2037	730,000	(12,837)	3,072		
Total fixed interest	**14,975,000**	**8,962**	**86,989**	**(1,185,774)**	**13,885,177**
Floating rate notes					
14 October 2022	130,000	(7)	692	-	130,684
Total bonds	**15,105,000**	**8,955**	**87,681**	**(1,185,774)**	**14,015,862**

14. Borrower notes

Borrower notes are subordinated debt instruments which are required to be held by each local authority that borrows from LGFA in an amount equal to a fixed percentage of the aggregate borrowings by that local authority. The fixed percentage is 2.5% for loans issued from 1 July 2020. Prior to this date, the fixed percentage was 1.6%.

LGFA may convert borrower notes into redeemable shares if it has made calls for all unpaid capital to be paid in full and the LGFA Board determines it is still at risk of imminent default.

15. Other liabilities

in $000s	Unaudited as at 31 December 2022	Audited as at 30 June 2022
Lease liability	112	156
Accruals	596	694
Total other liabilities	**708**	**850**

16. Share capital

As at 31 December 2022, LGFA had 45 million ordinary shares on issue, 20 million of which remain uncalled.

All ordinary shares rank equally with one vote attached to each ordinary share. Ordinary shares have a face value of $1 per share.

17. Shareholder information

Registered holders of equity securities	As at 31 December 2022		As at 30 June 2022	
Minister of Finance and Minister for Local Government	5,000,000	11.1%	5,000,000	11.1%
Auckland Council	3,731,960	8.3%	3,731,960	8.3%
Christchurch City Council	3,731,960	8.3%	3,731,960	8.3%
Hamilton City Council	3,731,960	8.3%	3,731,960	8.3%
Bay of Plenty Regional Council	3,731,958	8.3%	3,731,958	8.3%
Greater Wellington Regional Council	3,731,958	8.3%	3,731,958	8.3%
Tasman District Council	3,731,958	8.3%	3,731,958	8.3%
Tauranga City Council	3,731,958	8.3%	3,731,958	8.3%
Wellington City Council	3,731,958	8.3%	3,731,958	8.3%
Western Bay of Plenty District Council	3,731,958	8.3%	3,731,958	8.3%
Whangarei District Council	1,492,784	3.3%	1,492,784	3.3%
Hastings District Council	746,392	1.7%	746,392	1.7%
Marlborough District Council	400,000	0.9%	400,000	0.9%
Selwyn District Council	373,196	0.8%	373,196	0.8%
Gisborne District Council	200,000	0.4%	200,000	0.4%
Hauraki District Council	200,000	0.4%	200,000	0.4%
Horowhenua District Council	200,000	0.4%	200,000	0.4%
Hutt City Council	200,000	0.4%	200,000	0.4%
Kapiti Coast District Council	200,000	0.4%	200,000	0.4%
Manawatu District Council	200,000	0.4%	200,000	0.4%
Masterton District Council	200,000	0.4%	200,000	0.4%
New Plymouth District Council	200,000	0.4%	200,000	0.4%
Otorohanga District Council	200,000	0.4%	200,000	0.4%
Palmerston North District Council	200,000	0.4%	200,000	0.4%
South Taranaki District Council	200,000	0.4%	200,000	0.4%
Taupo District Council	200,000	0.4%	200,000	0.4%
Thames-Coromandel District Council	200,000	0.4%	200,000	0.4%
Waimakariri District Council	200,000	0.4%	200,000	0.4%
Waipa District Council	200,000	0.4%	200,000	0.4%
Whakatane District Council	200,000	0.4%	200,000	0.4%
Whanganui District Council	200,000	0.4%	200,000	0.4%
Total	**45,000,000**	**100%**	**45,000,000**	**100%**

18. Reconciliation of net profit to net cash flow from operating activities

in $000s	Unaudited six months ended 31 December 2022	Unaudited six months ended 31 December 2021
Net profit/(loss) for the period	1,108	5,935
Cash applied to loans	(1,639,024)	(1,427,636)
Non-cash adjustments		
Amortisation and depreciation	2,643	(3,955)
Working capital movements		
Net change in trade debtors and receivables	(378)	13
Net change in prepayments	(298)	(319)
Net change in accruals	(98)	73
Net Cash From Operating Activities	**(1,636,047)**	**(1,425,888)**

19. Related parties

Identity of related parties

LGFA is related to the local authorities set out in the Shareholder Information in note 17.

LGFA operates under an annual Statement of Intent that sets out the intentions and expectations for LGFA's operations and lending to participating borrowers.

Shareholding local authorities, and non-shareholder local authorities who borrow more than $20 million, are required to enter into a guarantee when they join or participate in LGFA. The guarantee is in respect of the payment obligations of other guaranteeing local authorities to the LGFA (cross guarantee) and of the LGFA itself.

Related party transactions

LGFA was established for the purpose of raising funds from the market to lend to participating borrowers. The lending to individual councils is disclosed in note 8, and interest income recognised on this lending is shown in the statement of comprehensive income.

The purchase of LGFA borrower notes by participating borrowers. Refer note 14.

The Treasury (New Zealand Debt Management) provides LGFA with a committed credit facility and is LGFA's derivatives counterparty.

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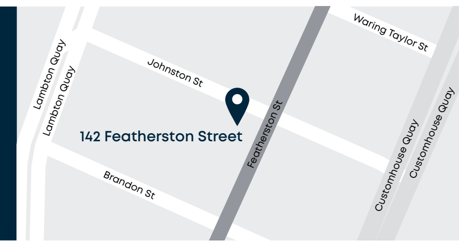

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LGFA New Zealand Local Government Funding Agency Te Pūtea Kāwanatanga ā-rohe

lgfa.co.nz

LGFA
New Zealand Local
Government Funding Agency
Te Pūtea Kāwanatanga ā-rohe

24 February 2023

Dear Shareholder

Draft Statement of Intent 2023-26

Please find attached a copy of the draft Statement of Intent (SOI) for the 2023-26 period.

LGFA continues to focus on delivering strong results for both our council borrowers and shareholders.

For our borrowing councils we seek to optimize funding terms and conditions by

- Achieving savings in borrowing costs
- Provide longer dated funding and
- Provide certainty of access to markets

For our shareholders we are focused on

- Delivering a strong financial performance
- Monitoring asset quality
- Enhancing our approach to treasury and risk management and
- Ensuring we have the correct governance framework and capital structure in place.

For our guarantors we are focused on

- Minimising the risk of a call upon the guarantee through actively monitoring and managing the business risks faced by LGFA including operational, credit, liquidity, interest rate and funding risk.

The following points regarding the draft SOI 2023-26 are worth noting:

- This draft SOI, including financial forecasts, assumes that there are no implications for LGFA from the Three Waters Reform Programme. We are awaiting further information relating to the establishment of the Water Services Entities (WSEs); how WSEs are intending to structure their borrowing; how the transition of revenue and debt will occur between our council members and WSEs, and the impact on future council borrowing intentions from the Three Waters Reform Programme. The final SOI in June 2023 will be updated from this draft to incorporate any future announcements/legislation relating to the Three Waters Reform Programme and will include a statement if there have been any material changes to our forecast assumptions.

- Profitability is forecast to rebound from the 2022-23 period with projections for Net Operating Gain of $9.5 million, $8.3 million and $7.6 million for the next three years.

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lgfa.co.nz

However, we remain cautious in placing too much emphasis on the Year Two (2024-25) and Three (2025-26) forecasts given we have $6.6 billion of LGFA bonds and $5.8 billion of council and CCO loans maturing over the three-year SOI forecast period. Assumptions regarding the amount and timing of refinancing and interest rates have a meaningful impact on financial projections.

- We have increased our forecast for council loans (short and long term) outstanding as at June 2024 to $16.410 billion and to $17.137 billion as at June 2025 (from $15.995 billion and $16.650 billion in the previous SOI). This reflects a higher starting position as at 30 June 2023 and councils undertaking further capex and a continued high utilisation of short-term borrowing from LGFA by councils.

- We are assuming a gross bond issuance of $3.2 billion (2023-24), $3.2 billion (2024-25) and $3.15 billion (2025-26) based on council gross lending of $2.8 billion (2023-24), $2.9 billion (2024-25) and $3.0 billion (2025-26)

- Net interest income is expected to gradually reduce over the forecast period as the balance sheet grows from increased council lending and positive impact from higher interest rates on the Liquid Asset Portfolio offset is offset by narrower lending margins.

- We have assumed a modest narrowing in lending margins as more councils and CCOs take up the Climate Action Loan (CAL) product and we undertake more Green, Social and Sustainability (GSS) lending to councils and CCOs. Given the high starting point with an average credit rating of “AA” on the council lending book, we have assumed no further improvement in the credit quality of the sector improves.

- Compared to the previous SOI, issuance and operating expenses, excluding Approved Issuer Levy (“AIL”) are forecast to be approximately $500k higher in the 2023-24 and 2024-25 financial years. This is due to forecast higher IT, staffing and legal costs.

- The SOI performance targets are similar to the previous SOI. There is a greater focus on sustainability with a target for new CALs, a greater focus on assisting councils with GHG emission reporting and assistance with the transition of Three Waters related debt from councils to the WSEs.

- As noted above, there is some timing uncertainty within the SOI forecast relating to council loans and LGFA bonds outstanding as we need to project both the repayment amount and repayment timing of the council loans that are due to mature in April 2024, April 2025 and April 2026. Decisions made by our council members regarding early refinancing will have a phasing impact across all three years in the SOI forecast.

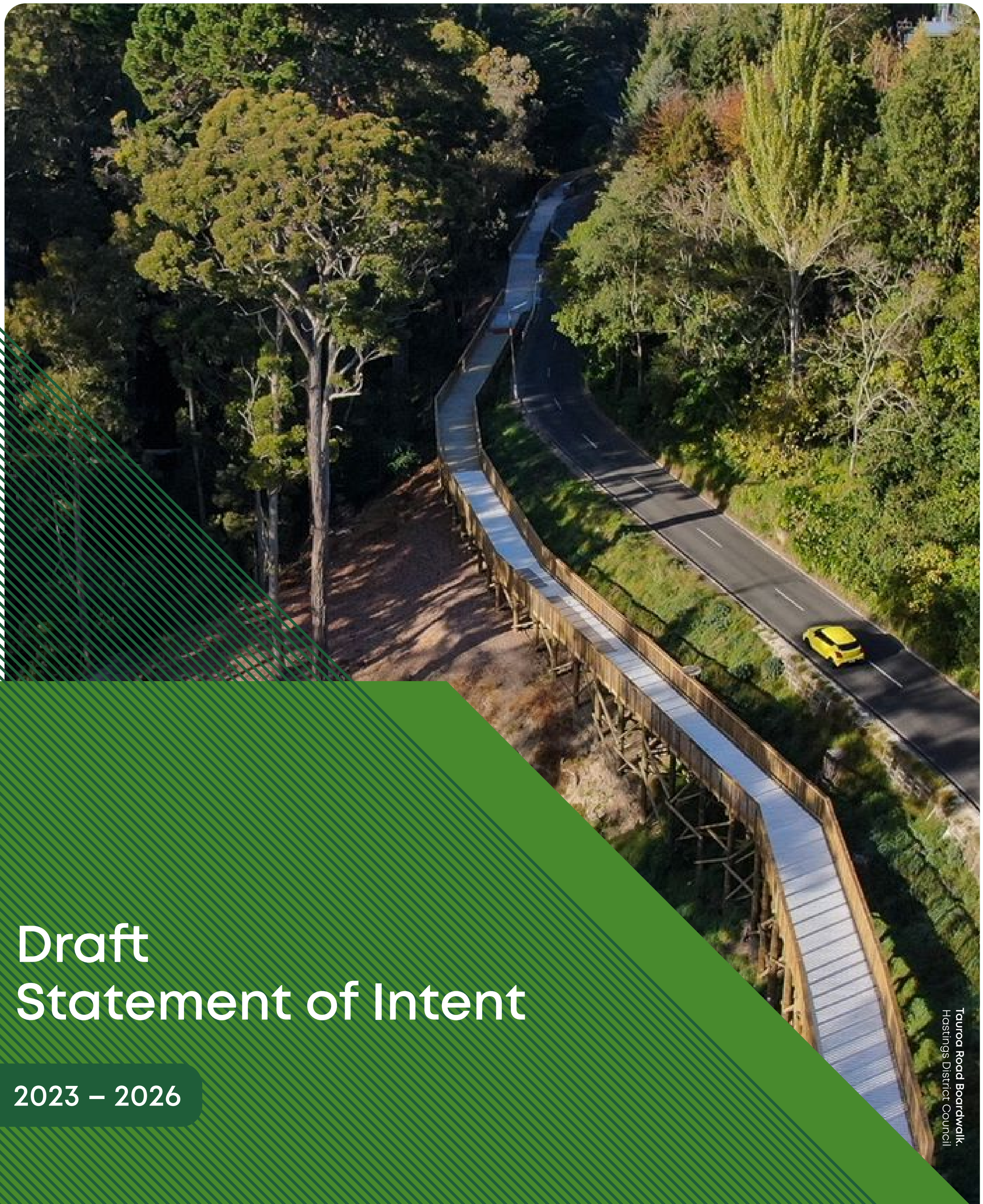
If you have any questions or wish to provide comments by 1 May 2023 then please feel free to contact myself or any member of the Shareholders Council. The LGFA board will consider any feedback received and provide a final version of the SOI to shareholders by 30 June 2023.

Yours sincerely

Mark Butcher
Chief Executive

LGFA

New Zealand Local Government Funding Agency
Te Pūtea Kāwanatanga ā-rohe



Tauroa Road Boardwalk.
Hastings District Council

Draft Statement of Intent

2023 – 2026

1. Introduction

This Statement of Intent (SOI) sets out the nature and scope of the activities, objectives and performance targets for the New Zealand Local Government Funding Agency Limited (LGFA) for the three-year period 1 July 2023 to 30 June 2026.

LGFA is enabled under the Local Government Borrowing Act 2011 and is a council-controlled organisation (CCO) for the purposes of the Local Government Act 2002.

The SOI is prepared in accordance with section 64(1) of the Local Government Act 2002.

Note: This draft SOI, including financial forecasts, assumes that there are no implications for LGFA from the proposed Three Waters Reform Programme. We are awaiting further information relating to the establishment of the Water Services Entities (WSEs); how WSEs are intending to structure their borrowing; how the transition of revenue and debt will occur between our council members and WSEs, and the impact on future council borrowing intentions from the proposed Three Waters Reform Programme. The final SOI in June 2023 will be updated from this draft to incorporate any future announcements/legislation relating to the proposed Three Waters Reform Programme and will include a statement if there have been any material changes to our forecast assumptions as a consequence.

2. Nature and scope of activities

LGFA raises debt funding for the purpose of providing debt financing to New Zealand local authorities and CCOs (participating borrowers).

LGFA may raise debt funding either domestically and/or offshore in either NZ dollars or foreign currency.

LGFA only lends to participating borrowers that have entered into required relevant legal and operational arrangements and comply with the LGFA's lending policies.

In addition, LGFA may undertake any other activities considered by the LGFA Board to be reasonably related, incidentally to, or in connection with, that business.

3. Our purpose Ta tatou kaupapa

Benefiting local communities through delivering efficient financing for local government.

Ka whiwhi painga ngā hapori mā te whakarato pūtea tōtika ki ngā kaunihera.

4. Our values Ō mātau uara

We act with integrity	We are customer focused	We strive for excellence	We provide leadership	We are innovative
E pono ana mātau	**E arotahi ana mātau ki te kiritaki**	**E whakapau kaha mātau kia hiranga te mahi**	**He kaiārahi mātau**	**He auaha mātau**
We are honest, transparent and are committed to doing what is best for our customers and our company.	Our customers are our council borrowers, investors, and all other organisations that we deal with. We listen to them and act in their best interests to deliver results that make a positive difference.	We strive to excel by delivering financial products and services that are highly valued at least cost while seeking continuous improvement in everything we do.	We are here for our stakeholders in being strategically minded, providing resilience and executing our strategy. We embrace a high-performance culture and can be relied upon to deliver results.	To meet our ever-changing customer requirements, we will encourage innovation and provide a diverse range of financial products and services.

5. Foundation objectives

The Shareholders' Agreement is a foundation document and states that, in accordance with the Local Government Act, in carrying on its business the objectives of the Company will be to:

(a) achieve the objectives of the Shareholders (both commercial and non-commercial) as specified in the Statement of Intent. The Shareholders agree that the Company shall carry on its business with a view to making a profit sufficient to pay a dividend in accordance with the Dividend Policy, but that the primary objective of the Shareholders with respect to the Company is that it optimises the terms and conditions of the debt funding it provides to Participating Local Authorities;

(b) be a good employer;

(c) exhibit a sense of social and environmental responsibility by having regard to the interests of the community in which it operates and by endeavouring to accommodate or encourage these when able to do so; and

(d) conduct its affairs in accordance with sound business practice.

This Statement of Intent sets out the company's strategic priorities, together with associated objectives and performance targets, which align with the foundation objectives and have been agreed with shareholders.

6. Strategic priorities

The following five strategic priorities encompass the foundation objectives and guide the LGFA Board and management in determining our strategy, objectives and associated performance targets.

Governance, capability and business practice

LGFA is committed demonstrating best practice corporate governance underpinned by sound business practice to ensure its long-term sustainability and success.

Optimising financing services for local government

LGFA's primary objective is to optimise the terms and conditions of the debt funding it provides to participating borrowers. Amongst other things, LGFA will achieve this by delivering operational best practice and efficiency across our lending products and services.

Environmental and social responsibility

LGFA recognises the risks inherent in climate change for councils and supports New Zealand's shift to a low-carbon economy. LGFA will exhibit a sense of social and environmental responsibility by having regard to the interests of the community in which it operates and by endeavouring to accommodate or encourage these when able to do so.

Effective management of loans

LGFA will ensure its loan book remains at a high standard by ensuring it understands each participating borrower's financial position and managing assets within an appropriate risk management framework to ensure shareholder value is not compromised.

Industry leadership and engagement

LGFA will take a proactive role to enhance the financial strength and depth of the local government debt market and will work with key central government and local government stakeholders on sector issues.

7. Objectives and performance targets

This section sets out LGFA's objectives and performance targets for SOI 2023-2026.

The financial performance targets are focused on the 2023-2024 year and, as applicable, are based on the financial forecasts outlined in section 8.

Governance, capability and business practice

Objectives	How we measure our performance
LGFA will:	
Demonstrate best practice corporate governance.	The Annual Report outlines our compliance with the eight core principles underpinning the NZX Corporate Governance Best Practice Code.
Set and model high standards of ethical behaviour.	LGFA has adopted a formal Code of Ethics, incorporating its Conflicts of Interest and Code of Conduct policies, which sets out the standards and values that directors and employees are expected to follow.
Achieve the shareholder-agreed objectives and performance targets specified in this Statement of Intent.	LGFA reports performance against objectives quarterly to shareholders and in our Annual and Half Year Reports.
Ensure products and services offered to participating borrowers are delivered in a cost-effective manner.	LGFA prepares annual operating budgets and monitors progress against these monthly. Financial performance is reported quarterly to shareholders and in our Annual and Half Year Reports.
Be a good employer by providing safe working conditions, training and development and equal opportunities for staff	The Annual Report reports on our health and safety and wellbeing practices and policies, compliance with the Health and Safety at Work Act, diversity and inclusion and capability and development.

Performance targets	2023-2024 target
Comply with the Shareholder Foundation Polices and the Board-approved Treasury Policy at all times	No breaches
Maintain LGFA's credit rating equal to the New Zealand Government sovereign rating where both entities are rated by the same Rating Agency	LGFA credit ratings equivalent to NZ Sovereign
LGFA's total operating income for the period to 30 June 2024	> $19.3 million
LGFA's total operating expenses for the period to 30 June 2024	< $9.5 million

Optimising financing services for local government

Objectives	How we measure our performance
LGFA will:	
Provide interest cost savings relative to alternative sources of financing.	Measure LGFA issuance spreads against other high-grade issuers in the New Zealand domestic capital markets.
Offer flexible short and long-term lending products that meet the borrowing requirements for borrowers.	Measure LGFA's share of overall council borrowing. Survey participating borrowers on an annual basis.
Deliver operational best practice and efficiency for lending services.	Monitor settlements errors for new trades and cashflows. Survey participating borrowers on an annual basis.
Ensure certainty of access to debt markets, subject always to operating in accordance with sound business practice.	Maintain a vibrant primary and secondary market in LGFA bonds. Monitor participation by investors at our tenders through bid-coverage ratios and successful issuance yield ranges.

Performance targets	2023-2024 target
Share of aggregate long-term debt funding to the Local Government sector	> 80%
Total lending to Participating Borrowers	> $16,410 million
Conduct an annual survey of Participating Borrowers who borrow from LGFA as to the value added by LGFA to the borrowing activities	> 85% satisfaction score
Successfully refinance existing loans to councils and LGFA bond maturities as they fall due	100%
Meet all lending requests from Participating Borrowers, where those requests meet LGFA operational and covenant requirements	100%

Environmental and social responsibility

Objectives	How we measure our performance
LGFA will:	
Assist the local government sector in achieving their sustainability and climate change objectives.	LGFA is committed to assist borrowers financing of projects that promote environmental and social wellbeing in New Zealand. Green, Social & Sustainability (GSS) loan applications from councils are appraised by the LGFA Sustainability Committee, with approved loans monitored for ongoing compliance.
Improve sustainability outcomes within LGFA.	LGFA is committed to reducing our carbon emissions and formalised processes to measure our greenhouse gas (GHG) emissions, as well as management plans to reduce our company's emissions.

Performance targets	2023-2024 target
Comply with the Health and Safety at Work Act 2015	No breaches
Maintain Toitū Carbon Zero certification	Carbon-zero certification maintained
Meet reduction targets outlined in our carbon reduction management plan	Reduction targets met.
Increase our GSS lending book and Climate Action Loans	Two new borrowers enter into GSS loans Three new borrowers enter into CALs
Issuance of LGFA Bonds under Sustainable Funding Framework	Issue Sustainable Funding Bonds
Ensure Annual Report is prepared in compliance with applicable GRI Standards	100%
Meet all mandatory climate reporting standards	100%

Effective management of loans

Objectives	How we measure our performance
LGFA will:	
Proactively monitor and review each Participating Borrower's financial position, including its financial headroom under LGFA policies. Analyse finances at the Council group level where appropriate and report to shareholders.	LGFA reviews all participating councils and CCOs financial statements on an annual basis and the agendas and management reports on an ongoing basis for all councils on the LGFA borrower watch-list. Participating borrowers are required to complete annual compliance certificates by the end of November each year.

Endeavour to meet each participating borrower annually, including meeting with elected officials as required, or if requested	Number of participating borrowers visited in a year
Assist a smooth transition of Three Water Related loans if the Three Waters Reform Programme progresses during the financial year for a 1 July 2024 implementation date	By 30th June 2024, LGFA will endeavour to facilitate a successful transition of existing council Three Water related loans to the Water Services Entities

Performance targets	2023-2024 target
Review each Participating Borrower's financial position	100%
Arrange to meet each Participating Borrower at least annually, including meeting with elected officials as required, or if requested	100%
Three Waters debt transition plan in place by 30 June 2024	100%

Industry leadership and engagement

Objectives	How we measure our performance
LGFA will:	
Take a proactive role to enhance the financial strength and depth of the local government debt market and work with key central government and local government stakeholders on sector and individual council issues.	Report on actions undertaken and progress made on sector issues.
Assist the local government sector with significant matters such as the proposed Three Waters Reform Programme.	Identifying any legislative or Central Government policy changes that may impact LGFA and undertake formal or informal submissions.
Maintain productive relationships with central government representatives.	Assist the local government sector with understanding any legislative or Central Government policy changes that may impact LGFA.
Support councils and CCOs in the development of reporting disclosures of the impacts of sector activity on climate change.	Report back on the alignment of LGFA and council's climate and emissions reporting requirements Report back in how we are helping smaller council's understand future reporting requirements.

8. Financial forecasts

LGFA's financial forecasts for the three years to 30 June 2026 are:

Comprehensive income $m	Jun 24	Jun 25	Jun 26
Net Interest income	**17.9**	**17.1**	**16.7**
Other operating income	1.3	1.3	1.3
Total operating income	**19.3**	**18.5**	**18.1**
Approved Issuer Levy	0.3	0.3	0.3
Issuance & onlending costs	3.8	3.9	4.0
Operating overhead	5.4	5.6	5.9
Issuance and operating expenses	**9.5**	**9.8**	**10.2**
P&L	**9.8**	**8.6**	**7.9**

Financial position (nominals) $m	Jun 24	Jun 25	Jun 26
Liquid assets portfolio	2,008	2,125	1,934
Loans to local government	16,410	17,137	17,980
Other assets	-	-	-
Total Assets	**18,419**	**19,262**	**19,914**
Bonds on issue (ex Treasury stock)	17,305	18,021	18,676
Bills on issue	600	600	600
Borrower notes	357	388	415
Other liabilities	-	-	-
Total Liabilities	**18,262**	**19,009**	**19,691**
Capital	25	25	25
Retained earnings	96	103	109
Dividend	(2)	(2)	(2)
Shareholder equity	**119**	**126**	**132**
Ratios	**Jun 24**	**Jun 25**	**Jun 26**
Liquid assets/funding liabilities	11.4%	11.5%	10.1%
Liquid assets/total assets	10.9%	11.0%	9.7%
Net interest margin	0.11%	0.10%	0.09%
Cost to income ratio	49.3%	53.3%	56.5%
Return on average assets	0.05%	0.04%	0.04%
Shareholder equity/total assets	0.6%	0.7%	0.7%
Shareholder equity + BN/total assets	2.6%	2.7%	2.7%
Asset growth	5.6%	4.6%	3.4%
Loan growth	5.7%	4.4%	4.9%
Return on equity	8.8%	7.2%	6.2%
Capital ratio	12.9%	13.4%	13.7%

Due to rounding, summary numbers presented in these financial forecasts may not add up precisely to the reported totals. The above forecasts assume a gross bond issuance programme of $3.20 billion (FY24), $3.20 billion (FY25) and $3.15 billion (FY26) based upon term lending to councils of $2.78 billion (FY24), $2.90 billion (FY25) and $3.0 billion (FY26).

Note there is a high level of uncertainty regarding the financial forecasts for both council borrowing and LGFA bond issuance due to the uncertainty relating to the proposed Three Waters Reform and the impact on councils.

Councils prepared their 2021-31 Long Term Plans (and borrowing forecasts) on the assumption that proposed Three Water Reform was not progressing and we have made the same assumption with our forecasts. LGFA projects it could have between $5 billion to $6 billion of loans to councils in June 2024 that are related to Three Waters. There have been no final decisions regarding the transfer mechanism for assets, liabilities and revenue from councils to the proposed Three Water entities. We intend to provide an update to stakeholders on implications for LGFA as further information becomes available.

9. Dividend policy

LGFA primary objective is to maximise benefits to participating borrowers rather than shareholders. Consequently, it is intended to pay a limited dividend to shareholders.

The Board's policy is to pay a dividend that provides an annual rate of return to shareholders equal to LGFA fixed rate bond cost of funds plus 2.00% over the medium term.

At all times payment of any dividend will be discretionary and subject to the Board's legal obligations and views on appropriate capital structure.

10. Governance

Board

The Board is responsible for the strategic direction and control of LGFA's activities. The Board guides and monitors the business and affairs of LGFA, in accordance with the Companies Act 1993, the Local Government Act 2002, the Local Government Borrowing Act 2011, the Company's Constitution, the Shareholders' Agreement for LGFA and this SOI.

The Board comprises six directors with five being independent directors and one being a non-independent director.

The Board's approach to governance is to adopt best practice with respect to:

- The operation of the Board.
- The performance of the Board.
- Managing the relationship with the Company's Chief Executive.
- Being accountable to all Shareholders.

All directors are required to comply with a formal Charter.

The Board will meet on a regular basis and no fewer than six times each year.

Shareholders' Council

The Shareholders' Council is made up of between five and ten appointees of the Shareholders (including an appointee from the Crown). The role of the Shareholders' Council is to:

- Review the performance of LGFA and the Board, and report to Shareholders on that performance on a periodic basis.
- Make recommendations to Shareholders as to the appointment, removal, replacement and remuneration of directors.
- Make recommendations to Shareholders as to any changes to policies, or the SOI, requiring their approval.
- Ensure all Shareholders are fully informed on LGFA matters and to coordinate Shareholders on governance decisions.

11. Information to be provided to Shareholders

The Board aims to ensure that Shareholders are informed of all major developments affecting LGFA's state of affairs, while at the same time recognising both LGFA's obligations under NZX Listing Rules and that commercial sensitivity may preclude certain information from being made public.

Annual Report

The LGFA's balance date is 30 June.

By 30 September each year, the Company will produce an Annual Report complying with Sections 67, 68 and 69 of the Local Government Act 2002, the Companies Act 1993 and Financial Reporting Act 2013. The Annual Report will contain the information necessary to enable an informed assessment of the operations of the company, and will include the following information:

- Directors' Report.
- Financial Statements incorporating a Statement of Financial Performance, Statement of Movements in Equity, Statement of Financial Position, Statement of Cashflows, Statement of Accounting Policies and Notes to the Accounts.
- Comparison of the LGFA's performance regarding the objectives and performance targets set out in the SOI, with an explanation of any material variances.
- Auditor's Report on the financial statements and the performance targets.
- Any other information that the directors consider appropriate.

Half Yearly Report

By 28 February each year, the Company will produce a Half Yearly Report complying with Section 66 of the Local Government Act 2002. The Half Yearly Report will include the following information:

- Directors' commentary on operations for the relevant six-month period.
- Un-audited half-yearly Financial Statements incorporating a Statement of Financial Performance, Statement of Movements in Equity, Statement of Financial Position and Statement of Cashflows.

Quarterly Report

By 31 January, 30 April, 31 July, and 31 October each year, the Company will produce a Quarterly Report. The Quarterly Report will include the following information:

- Commentary on operations for the relevant quarter, including a summary of borrowing margins charged to Participating Borrower's (in credit rating bands).
- Comparison of LGFA's performance regarding the objectives and performance targets set out in the SOI, with an explanation of any material variances.
- Analysis of the weighted average maturity of LGFA bonds outstanding.
- In the December Quarterly Report only, commentary on the Net Debt/Total Revenue percentage for each Participating Local Authority that has borrowed from LGFA (as at the end of the preceding financial year).
- To the extent known by LGFA, details of all events of review in respect of any Participating Borrower that occurred during the relevant quarter (including steps taken, or proposed to be taken, by LGFA in relation thereto).
- Details of any lending to CCOs during the quarter and the amount of CCO loans outstanding.
- Commentary on sustainability initiatives.

Statement of Intent

By 1 March in each year the Company will deliver to the Shareholders its draft SOI for the following year in the form required by Clause 9(1) of Schedule 8 and Section 64(1) of the Local Government Act 2002.

Having considered any comments from the Shareholders received by 30 April, the Board will deliver the completed SOI to the Shareholders on or before 30 June each year.

Shareholder Meetings

The Board will hold an Annual General Meeting between 30 September and 30 November each year to present the Annual Report to all Shareholders.

The Company will hold a meeting with the Shareholders' Council approximately every six months – prior to the Annual General Meeting and after the Half Yearly Report has been submitted. Other meetings may be held by agreement between the Board and the Shareholders' Council.

12. Acquisition / divestment policy

LGFA will invest in securities in the ordinary course of business. It is expected that these securities will be debt securities. These investments will be governed by LGFA's lending and/or investment policies as approved by the Board and/or Shareholders.

Any subscription, purchase or acquisition by LGFA of shares in a company or organisation will, if not within those investment policies, require Shareholder approval other than as concerns the formation of wholly owned subsidiaries and the subscription of shares in such wholly owned subsidiaries.

13. Activities for which compensation is sought from Shareholders

At the request of Shareholders, LGFA may (at its discretion) undertake activities that are not consistent with its normal commercial objectives. Specific financial arrangements will be entered into to meet the full cost of providing such activities.

Currently there are no activities for which compensation will be sought from Shareholders.

14. Commercial value of Shareholder's investment

LGFA will seek to maximise benefits to Participating Local Authorities as Borrowers rather than Shareholders.

Subject to the Board's views on the appropriate capital structure for LGFA, the Board's intention will be to pay a dividend that provides an annual rate of return to Principal Shareholders equal to LGFA fixed rate bond cost of funds plus 2.00% over the medium term.

As the Shareholders will have invested in the LGFA on the basis of this limited dividend, the Board considered that at establishment the commercial value of LGFA was equal to the face value of the Shareholders' paid up Principal Shares - $25 million.

In the absence of any subsequent share transfers to the observed share transfers on 30 November 2012, the Board considers the current commercial value of LGFA is at least equal to the face value of the Shareholders' paid up Principal Shares of $25 million. This equates to a value per share of $1.00.

15. Accounting policies

LGFA has adopted accounting policies that are in accordance with the New Zealand International Financial Reporting Standards and generally accepted accounting practice.

Statement of Accounting Policies

1. Reporting entity

The New Zealand Local Government Funding Agency Limited (LGFA) is a company registered under the Companies Act 1993 and is subject to the requirements of the Local Government Act 2002.

LGFA is controlled by participating local authorities and is a council-controlled organisation as defined under section 6 of the Local Government Act 2002. LGFA is a limited liability company incorporated and domiciled in New Zealand.

The primary objective of LGFA is to optimise the debt funding terms and conditions for participating borrowers.

The registered address of LGFA is Level 8, City Chambers, 142 Featherston Street, Wellington Central, Wellington 6011.

2. Statement of compliance

LGFA is an FMC reporting entity under the Financial Markets Conduct Act 2013 (FMCA). These financial statements have been prepared in accordance with that Act and the Financial Reporting Act 2013. LGFA's bonds are quoted on the NZX Debt Market.

LGFA is a profit orientated entity as defined under the New Zealand Equivalents to International Financial Reporting Standards (NZ IFRS).

The financial statements have been prepared in accordance with New Zealand Generally Accepted Accounting Practice (NZ GAAP) and they comply with NZ IFRS and other applicable Financial Reporting Standard, as appropriate for Tier 1 for-profit entities. The financial statements also comply with International Financial Reporting Standards (IFRS).

3. Basis of preparation

Measurement base

The financial statements have been prepared on a historical cost basis modified by the revaluation of certain assets and liabilities.

The financial statements are prepared on an accrual basis.

Functional and presentation currency

The financial statements are presented in New Zealand dollars rounded to the nearest thousand, unless separately identified. The functional currency of LGFA is New Zealand dollars.

Foreign currency conversions

Transactions denominated in foreign currency are translated into New Zealand dollars using exchange rates applied on the trade date of the transaction.

Changes in accounting policies

There have no changes to accounting policies.

Early adoption standards and interpretations

LGFA has not early adopted any standards.

Standards not yet adopted

LGFA does not consider any standards or interpretations in issue but not yet effective to have a significant impact on its financial statements.

Financial instruments

Financial assets

Financial assets, other than derivatives, are recognised initially at fair value plus transaction costs and subsequently measured at amortised cost using the effective interest rate method.

Cash and cash equivalents include cash on hand, bank accounts and deposits with an original maturity of no more than three months.

Cash provided by LGFA as security for financial arrangements remains a financial asset of LGFA and is recognised as cash pledged as collateral in the Statement of Financial Position, separate from cash and cash equivalents

Purchases and sales of all financial assets are accounted for at trade date.

At each balance date, an expected credit loss assessment is performed for all financial assets and is calculated as either:

- Credit losses that may arise from default events that are possible within the next 12 months, where no significant increase in credit risk has arisen since acquisition of the asset, or
- Credit losses that may arise from default events that are possible over the expected life of the financial asset, where a significant increase in credit risk has arisen since acquisition of the asset.

Impairment losses on financial assets will ordinarily be recognised on initial recognition as a 12-month expected loss allowance and move to a lifetime expected loss allowance if there is a significant deterioration in credit risk since acquisition.

Financial liabilities

Financial liabilities, other than derivatives, are recognised initially at fair value less transaction costs and subsequently measured at amortised cost using the effective interest rate method.

Derivatives

Derivative financial instruments are recognised both initially and subsequently at fair value. They are reported as either assets or liabilities depending on whether the derivative is in a net gain or net loss position respectively.

Fair value hedge

Where a derivative qualifies as a hedge of the exposure to changes in fair value of an asset or liability (fair value hedge) any gain or loss on the derivative is recognised in profit and loss together with any changes in the fair value of the hedged asset or liability.

The carrying amount of the hedged item is adjusted by the fair value gain or loss on the hedged item in respect of the risk being hedged. Effective parts of the hedge are recognised in the same area of profit and loss as the hedged item.

Other assets

Property, plant and equipment

Items of property, plant and equipment are initially recorded at cost.

Depreciation is charged on a straight-line basis at rates calculated to allocate the cost or valuation of an item of property, plant and equipment, less any estimated residual value, over its remaining useful life.

Intangible assets

Intangible assets comprise software and project costs incurred for the implementation of the treasury management system. Capitalised computer software costs are amortised on a straight-line basis over the estimated useful life of the software (three to seven years). Costs associated with maintaining computer software are recognised as expenses.

Other liabilities

Employee entitlements

Employee entitlements to salaries and wages, annual leave and other similar benefits are recognised in the profit and loss when they accrue to employees.

Revenue

Interest income

Interest income is accrued using the effective interest rate method.

The effective interest rate exactly discounts estimated future cash receipts through the expected life of the financial asset to that asset's net carrying amount. The method applies this rate to the principal outstanding to determine interest income each period.

Expenses

Expenses are recognised in the period to which they relate.

Interest expense

Interest expense is accrued using the effective interest rate method.

The effective interest rate exactly discounts estimated future cash payments through the expected life of the financial liability to that liability's net carrying amount. The method applies this rate to the principal outstanding to determine interest expense each period.

Income tax

LGFA is exempt from income tax under Section 14 of the Local Government Borrowing Act 2011.

Goods and services tax

All items in the financial statements are presented exclusive of goods and service tax (GST), except for receivables and payables, which are presented on a GST-inclusive basis. Where GST is not recoverable as input tax, then it is recognised as part of the related asset or expense.

The net amount of GST recoverable from, or payable to, the IRD is included as part of receivables or payables in the statement of financial position.

The net GST paid to, or received from the IRD, including the GST relating to investing and financing activities, is classified as a net operating cash flow in the statement of cash flows.

Commitments and contingencies are disclosed exclusive of GST.

Segment reporting

LGFA operates in one segment being funding of participating borrowers in New Zealand.

Judgements and estimations

The preparation of these financial statements requires judgements, estimates and assumptions that affect the application of policies and reported amounts. For example, the fair value of financial instruments depends critically on judgements regarding future cash flows, including inflation assumptions and the risk-free discount rate.

The estimates and associated assumptions are based on historical experience and various other factors that are believed to be reasonable under the circumstances. Actual results may differ from these estimates and these estimates and underlying assumptions are reviewed on an ongoing basis. Where these judgements significantly affect the amounts recognised in the financial statements they are described in the following notes.

The financial statements as at 30 June 2022 include estimates and judgements of the potential impact of COVID-19 and the proposed Three Waters Reform Programme on LGFA's financial position and performance. Whilst there has been no material impact on the estimates and judgements at the date these financial statements are authorised, it is noted that there is significant uncertainty with regards to the medium and long-term effects of COVID-19, as well as the outcome of proposed Three Waters Reform Programme on the local government sector.

TE KAUNIHERA Ā ROHE O WHAKAAHURANGI
STRATFORD DISTRICT COUNCIL

Our reference
F19/13/03-D21/40748

Karakia

Kia uruuru mai	I draw in (to my being)
Ā hauora	The reviving essence
Ā haukaha	The strengthening essence
Ā haumāia	The essence of courage
Ki runga, Ki raro	Above, Below
Ki roto, Ki waho	Within, Around
Rire rire hau Paimārire	Let there be peace.

Stratford District
In the heart of Taranaki

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