MAKING A DIFFERENCE:

Good Practice in Climate Change Performance and Compliance Audits

About this guide

This report is a practical resource for Supreme Audit Institutions (SAIs) to enhance the impact of their climate-related work. Aligned with UN General Assembly Resolution 79/231, it provides proven techniques based on the analysis of 60 global climate audit reports. The guide moves beyond theoretical frameworks to offer SAIs the tools needed to verify whether national climate commitments are translating into measurable results.

The guide supports audit offices at all capacity levels through a toolkit of 15 good practices and progressive frameworks. These allow SAIs to move from foundational institutional assessments to practical evaluations of policy coherence and environmental outcomes. It also addresses the fiscal implications of the energy transition, ensuring that climate action is evaluated as part of a coherent and sustainable fiscal strategy.

About the UNDP Climate Finance Network

Climate Finance Network

The UNDP Climate Finance Network (CFN) supports Asia-Pacific countries in bridging the gap between climate goals and the investment needed to reach them. As a regional platform, CFN provides technical and policy support to integrate climate into public finance, mobilize private and innovative capital, and create the enabling environment required for lasting impact through regional knowledge exchange and peer learning. Learn more at https://go.undp.org/climate-finance-network.

About the UNDP Sustainable Finance Hub

The UNDP Sustainable Finance Hub brings together UNDP's financial expertise to harness public and private capital for the Sustainable Development Goals (SDGs), supporting governments, investors and businesses in reaching climate, social impact and sustainability targets. Its work drives systemic change towards a sustainable financial architecture that benefits people and the planet.

About UNDP

UNDP is the leading United Nations organization fighting to end the injustice of poverty, inequality, and climate change. Working with our broad network of experts and partners in 170 countries, we help nations to build integrated, lasting solutions for people and planet. Learn more at undp.org or follow at @UNDP.

Disclaimer

The views expressed in this publication are those of the authors and do not necessarily reflect the views and policies of UNDP or the governments they represent. The United Nations do not guarantee the accuracy of the data included in this publication and accept no responsibility for any consequence of their use. Any reference to a commercial entity or product in this publication does not imply endorsement.

Copyright ©UNDP 2026. All rights reserved.

One United Nations Plaza, New York, NY 10017, USA.

This report was made possible by the generous support of the UK government's flagship Climate Action for a Resilient Asia (CARA) programme to build climate resilience in South Asia, Southeast Asia, and the Pacific islands, and the Government of Sweden through the Swedish International Development Cooperation Agency (SIDA).

Sweden Sverige

UK International Development
Partnership | Progress | Prosperity

ACKNOWLEDGEMENTS

This guide was developed by the United Nations Development Programme (UNDP). It was authored by Peter Welch, Lead Consultant. The project was led by Asad Maken (overall direction and supervision), Vivek Misra (technical lead and coordination) and supported by Sudarshan Kasturirangan (peer review), and Giulio Fabris (communications and knowledge dissemination).

The guide draws extensively on the work of the INTOSAI Working Group on Environmental Auditing (WGEA) and the INTOSAI Development Initiative (IDI), whose programmes on climate auditing provided essential foundations, and on the Tribunal de Contas da União of Brazil, whose audit of public policies for the energy transition exemplifies many of the good practices this guide seeks to promote.

The preparation of this guide benefited from the contributions of the following Supreme Audit Institutions and organizations, through consultation, review, and the sharing of audit experience:

- Accountability State Authority of Egypt
- Bundesrechnungshof (Germany)
- European Court of Auditors
- National Audit Office of Bulgaria
- National Audit Office of Finland
- National Audit Office of Norway
- National Audit Office of Tanzania
- Office of the Auditor General of Canada
- Office of the Auditor General of Pakistan
- Office of the Comptroller and Auditor General of India
- Sri Lanka Climate Fund
- State Audit Office of the Czech Republic
- State Audit Office of the Kingdom of Thailand
- Tribunal de Cuentas de España

The author is grateful to Professor David Heald of the University of Glasgow for his comments on the fiscal sustainability analysis in chapter 8.

FOREWORD

The climate crisis is as much about fiscal management and accountability as it is about the environment. As the call for re-routing resources toward climate action increase, the stakes for governance have never been higher. Accountability is the bridge between a policy promise and a realized result; without it, massive investments risk being lost to inefficiency or misalignment. For governments, the challenge is no longer just securing the funds, but demonstrating to their citizens and parliaments that every dollar spent is actually leading to increased resilience and reduced carbon emissions.

The message from the 2025 UNEP Emissions Gap Report and Adaptation Gap Report is clear: there is a massive implementation gap between what is promised and what is happening. We are currently on track for 2.3–2.5°C of warming, far beyond the Paris Agreement limits. To change this trajectory, global climate finance m ust i ncrease fi ve-fold an nually. These figures aren't just statistics; they represent the scale of the oversight task ahead. The challenges go beyond the need for a massive scale-up in resources, but it is also about fixing t he s ystemic l eakages i n how they are managed. Weak public financial management can cost regions like Asia and the Pacific up to 9% of total GDP.

Furthermore, in a disaster-prone region like Asia-Pacific, 63% of global finance is currently directed toward mitigation, leaving adaptation underfunded and therefore failing to address the core of the problem.

The national budget is the primary instrument for turning climate ambition into reality. Developing countries are leading the way by embedding climate goals directly into their Public Financial Management (PFM) systems. When climate targets, such as Nationally Determined Contributions (NDCs) and National Adaptation Plans (NAPs), are embedded into the fiscal cycle, they move from being aspirational documents to resourced mandates.

As this mainstreaming accelerates, the need for rigorous transparency becomes the new imperative for stable, climate-smart economies.

In this shift, Supreme Audit Institutions (SAIs) can serve as the guarantors of climate impact. By providing independent, evidence-based oversight, SAIs move beyond the balance sheet to answer the questions that matter: Is this adaptation project actually building resilience among climate-vulnerable communities? Is this mitigation fund truly lowering emissions? SAIs transform high-level political commitments into evidence that parliaments need to hold the executive branch accountable over decades, not just election cycles.

Moving beyond theory, this guide is a concrete tool for impact. Identifying successful practices from more than 60 countries, it provides replicable frameworks for performance and compliance audits in mitigation and adaptation. Beyond traditional auditing, it also explores foresight issues, such as the energy trilemma and revenue transitions, that are already reshaping the future of public finances.

We hope SAIs worldwide find this good practice guide useful and relevant. We encourage the application of the lessons and good practices captured in this guide in their climate audit practice We sincerely thank the contributing SAIs for their insights. Supported by the Governments of Sweden and the United Kingdom, we hope this guide serves as a practical, high-impact companion for auditors and policymakers alike.

By equipping institutions with the tools to rigorously scrutinize climate action, we can ensure that every investment made today builds a more accountable, resilient, and sustainable tomorrow.

Asad Maken

UNDP Regional Public Climate Finance Advisor

CONTENTS

Foreword 4

Executive summary 8

Introduction 11

PART 1: UNDERSTANDING CLIMATE AUDITS 16

Chapter 1: Context and framework 17

1.1 Financial architecture: Climate finance and national budgets 18
1.2 The mitigation and adaptation challenge 20
1.3 Avoiding goal displacement 21
1.4 Foresight: Energy, fiscal sustainability, and climate action 21

Chapter 2: Climate audit approaches 23

2.1 Evolution of climate audits and the enabling environment 23
2.2 Performance audits and compliance audits 25
2.3 Relevance of a whole-of-government approach 25
2.4 Challenges in undertaking climate audits 27
2.5 Key opportunities: Using global benchmarks 28
2.6 Guidance for resource-constrained SAIs 28

PART 2: GOOD PRACTICES IN CLIMATE AUDITING 30

Chapter 3: Good practices in climate change performance and compliance audits 31

3.1 Begin with an overall review to identify strengths, gaps, and audit priorities using multiple sources of evidence 31
3.2 Focus on outcomes 33
3.3 Put together an independent analysis that produces new evidence 34
3.4 Use global benchmarks and indices to situate national performance in an international context 35
3.5 Apply a whole-of-government approach 37
3.6 Quantify findings wherever possible and ensure monitoring frameworks enable meaningful measurement 38
3.7 Use satellite and aerial imagery to verify performance and compliance with spatial requirements, where this produces good results 39
3.8 Assess policy coherence: Examine whether government policies across sectors work together or undermine each other 41
3.9 Assess whether climate action prioritizes those most vulnerable 44
3.10 Assess whether adaptation strategies anticipate rather than react 45
3.11 Consider inherent and control risks when planning compliance work, recognizing that schemes aiming to change behaviour have higher inherent risk than conventional procurement 46
3.12 Distinguish between agency error and recipient non-compliance to identify where problems occur 48
3.13 Play a constructive role by helping administrators design schemes with lower inherent risk and more effective control systems 49
3.14 Ensure audit teams understand climate science fundamentals and build capacity progressively from foundational assessments towards more demanding policy coherence analysis 49
3.15 Follow up on previous recommendations to create cumulative accountability and document patterns of repeated non-implementation where they occur 51

Strengthening climate audits: Some risks to avoid 51

Chapter 4: Communicating findings for impact 53

Chapter 5: A progressive framework for climate mitigation performance audits 55

5.1 Have we set up the structures to meet international commitments? 57
5.2 Are we achieving our emissions reduction goals? 59
5.3 Are costs kept near the minimum needed and do polluters pay? 61
5.4 Have governments identified and tackled barriers to achieving mitigation? 63
5.5 What needs to change? 64

Chapter 6: A progressive approach to climate adaptation performance audits 66

6.1 Have we assessed climate risks and established structures to address them? 69
6.2 Is adaptation happening at appropriate pace and cost, and is it appropriately sequenced? 71
6.3 Are countries learning from implementation and avoiding maladaptation? 73

Chapter 7: A progressive approach to climate compliance audits 75

7.1 Does enabling legislation create clear obligations? 77
7.2 Are implementing regulations and technical standards in place? 79
7.3 Are compliance mechanisms and oversight systems functioning? 80
7.4 Do entities comply with requirements? 82
7.5 Are enforcement actions taken when non-compliance is identified? 83

PART 3: LOOKING FORWARD 86

Chapter 8: Looking to the future: Economic transition and fiscal sustainability 87

8.1 An audit approach to the energy trilemma in the face of evolving technology and energy costs 87
8.2 How is the energy transition affecting the fiscal outlook? 91
8.3 Fiscal policy coherence in the energy transition 94
8.4 Decommissioning costs and long-term liabilities 95
8.5 Taxation and revenue architecture 96
8.6 Fossil fuel subsidies and tax expenditures in the context of fiscal constraint 96
8.7 Compliance audit entry points for climate fiscal risks 97
8.8 Strategic questions for SAIs 99
8.9 Specific considerations for countries dependent on resource revenues 100
8.10 Conclusion 101

GLOSSARY AND ANNEXES 102

Glossary: Key terms and definitions 103
Annex A: Global benchmarks and tools for SAIs 107
Annex B: Good practice examples from SAI audits 116
Annex C: Goal displacement 121
Annex D: Effective recommendations: Good practice examples 122
Bibliography 124

List of figures, tables, and boxes

Figures

Figure ES.1: The implementation gap 10

Figure 1: Four pillars of high-impact auditing 13

Figure 2: Structure of the financing architecture 20

Figure 3: Goal displacement in climate policy 22

Figure 4: Identifying fragmentation, overlap, and duplication 37

Figure 5: Methane emitters mapped by NASA 40

Figure 6: A five-stage framework for auditing climate mitigation 55

Figure 7: The three-stage path to climate adaptation 66

Figure 8: Compliance audits: From legislation to enforcement 75

Tables

Table 1: Most frequent recommendation themes in climate audits 13

Table 2: Identifying maladaptive subsidies in energy and water 43

Table 3: Mapping the trilemma to fiscal audit questions 88

Table 4: Summary of emerging structural drivers 92

Table 5: Fiscal risk areas and possible audit questions 93

Table 6: Revenue transition risks 96

Boxes

Box 1: ClimateScanner: A global starting point for climate accountability 23

Box 2: IDI/INTOSAI WGEA Global Coordinated Audit on Climate Change Adaptation Actions 24

Box 3: Use of global benchmarks by Brazil's Tribunal de Contas 36

Box 4: Philippines commission on audit: National report on the climate change action plan 39

Box 5: Verification of environmental conditionality 41

Box 6: TCU Brazil's energy transition audit exemplifies comprehensive coherence assessment 42

Box 7: Climate finance mechanisms and compliance audit challenges 47

Box 8: Common fiscal risks identified by SAIs in the energy transition 89

Box 9: Norway's example of long-term fiscal sustainability 90

Box 10: Finance ministry survey evidence: The gap between concern and analytical integration 91

Box 11: Audit questions for fiscal policy coherence 94

Box 12: Specific considerations for fossil fuel revenue-dependent countries 100

EXECUTIVE SUMMARY

Photo: Alice Plate/UNDP Papua New Guinea

Context

Despite progress in creating climate plans and governance structures, most countries have made limited headway in reducing emissions or building resilience. Supreme Audit Institutions (SAIs) examining whether national commitments translate into measurable results provide essential accountability, but this requires moving beyond checking whether procedures were followed to assessing whether objectives were achieved.

Climate change affects public finances through multiple channels: renewable energy transformation creating both opportunities and challenges, food price impacts already evident globally, fiscal pressures for fossil fuel exporters, and evolving revenue architecture as energy systems change. Understanding these dynamics and their implications for fiscal sustainability, budget credibility, and long-term planning helps SAIs fulfil their mandates to promote sound public financial management.

A resource for Supreme Audit Institutions

The UN General Assembly's December 2024 resolution 79/231 recognized the role of SAIs in "providing independent and objective assessments of national action" on climate change. This guide responds by collating proven practices from SAIs worldwide, based on analysis of approximately 60 climate audit reports across all regions.

Purpose and approach

SAIs examining climate action need to decide where to start, how to design audits that generate impact, and how to build capacity given resource constraints. This guide addresses those questions by identifying what has worked in practice.

The material draws on SAI experience rather than theoretical frameworks and examines how the Commissioner of the Environment and Sustainable Development in Canada synthesized multi-decade findings, how Pacific SAIs designed cooperative audits addressing shared vulnerabilities, how Tanzania verified claims using satellite imagery, and how the United Kingdom's National Audit Office identified misaligned spending priorities. These examples demonstrate that effective climate auditing is achievable across diverse contexts. Four themes organize the material:

1. **Focus on outcomes:** Climate audits achieve impact by focusing on outcomes (emissions reduced, vulnerability decreased) rather than processes (plans completed, committees established).
2. **Cover the whole of government:** Climate action operates across government, requiring audit approaches that trace responsibilities and resources beyond specialized ministries.
3. **Build capacity progressively:** SAIs build capacity progressively through successive frameworks rather than attempting sophisticated evaluations immediately.
4. **Communicate effectively:** Quantified audit findings in clear, published reports help ensure that audits drive change.

Structure and content

Part 1: Understanding climate audits covers international frameworks (Paris Agreement, Nationally Determined Contributions, National Adaptation Plans), climate finance architecture and evolving sustainability reporting standards (Task Force on Climate-related Financial Disclosures, International Sustainability Standards Board, International Public Sector Accounting Standards Board). It explains how climate budget tagging functions in practice and how SAIs assess whether climate finance achieves environmental outcomes.

Part 2: Good practices presents material in two complementary formats:

Chapter 3 organizes 15 good practices by audit cycle phases, from preparation through communication. Each includes examples showing application, evidence generated, and effective recommendations. This serves SAIs looking for specific techniques relevant to current work.

Chapters 5–7 provide progressive frameworks for mitigation (five stages), adaptation (three stages), and compliance (five stages). Each stage includes potential audit questions, evidence sources, findings from actual audits, and example recommendations. The frameworks reflect observed patterns in SAI practice, enabling strategic planning of audit programmes.

Part 3: Looking forward addresses fiscal sustainability and energy transition economics: revenue risks for fossil-fuel-dependent countries, decommissioning liabilities, stranded assets, policy coherence between climate commitments and production plans, and taxation challenges as energy systems evolve. These fiscal effects also raise questions of policy coherence: whether public spending, taxation, and subsidy policies support or undermine governments' stated climate commitments.

The **annexes** catalogue global benchmarks and databases; organize good practice examples thematically; provide guidance on writing effective recommendations; and discuss goal displacement, the organizational dynamic where procedural compliance can substitute for outcome achievement.

Application

The guide serves different SAI needs and can be used flexibly:

- Resource-constrained SAIs (including SAIs in climate-vulnerable states) can identify approaches proven effective without unlimited budgets: leveraging freely available global benchmarks, using publicly available satellite imagery, applying purposive sampling with clear criteria, and participating in cooperative audits with shared methodology.
- Experienced climate auditors can use progressive frameworks to identify gaps in previous coverage and plan next-generation audits moving from process assessment towards outcome evaluation.
- SAIs developing strategic direction can examine where audit practice converges globally (the recommendation themes table identifies common patterns) and where frontier practice is heading.

- SAIs with foresight mandates can apply analytical frameworks for examining energy transition fiscal implications, a key issue in many jurisdictions, particularly for SAIs in fossil fuel dependent economies.

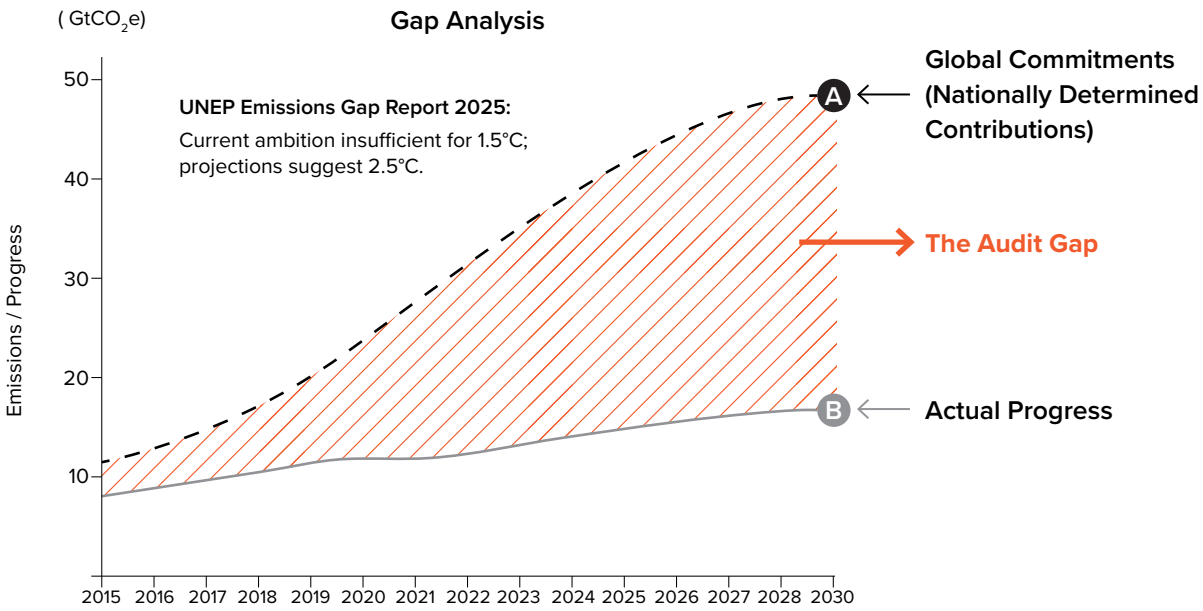
Moving forward

Climate auditing continues to evolve as SAIs develop new approaches and share lessons learned. This guide represents what the global SAI community has learned through practice, successes worth replicating, techniques that proved effective, and frameworks that helped SAIs navigate complex terrain.

The examples throughout the guide demonstrate that SAIs worldwide are successfully conducting impactful climate audits despite varied mandates, different resource levels, and diverse national contexts. International cooperation, knowledge sharing, and strategic use of available tools enable SAIs to examine climate action effectively and hold governments accountable for results.

Figure ES.1 illustrates the implementation gap that this guide addresses. The guide aims to be a practical resource as SAIs continue their essential work.

Figure ES.1: The Implementation Gap: Plans Exist, But Results Lag



Governance structures exist, yet few countries have reduced net emissions.
The SAI's role is to **move beyond checking if plans exist to auditing whether they work**.

INTRODUCTION

Photo: UNDP Thailand

This guide collates successful practices from Supreme Audit Institutions (SAIs) conducting climate change audits worldwide. It identifies approaches that SAIs have found effective and, wherever possible, readily replicable, to help more SAIs achieve significant impact through their climate audit work.

The UN General Assembly resolution of 19 December 2024 recognized the role of SAIs in "contributing to Governments' efforts to address climate change by providing independent and objective assessments of national action in this field, fostering the efficient allocation of resources, assessing the effectiveness of policy implementation, and promoting transparency and good governance."

This oversight function proves particularly valuable for parliaments grappling with climate policies that operate over decades and span multiple ministries. Climate audits can provide legislatures with time-series evidence of policy trends, identification of emerging fiscal risks, and forward-looking information on contingent liabilities. These are elements identified as stimulating parliamentary interest[1]. They support parliamentary scrutiny even when climate action involves long implementation timeframes and cross-cutting responsibilities that traditional budget oversight struggles to capture. Section 3.3 discusses how SAIs can undertake the independent analytical work that produces these kinds of findings.

1 Welch, P. (2023). *Users of Government Financial Statements Parliamentary Interest*. GOV/SBO(2023)7. Organisation for Economic Co-operation and Development. Paris, France.

Meeting these aspirations matters because, despite significant progress in creating plans and structures mandated at Conference of the Parties (COP) sessions, many countries have made little progress in reducing net greenhouse gas (GHG) emissions.[2] Similarly, the United Nations Environment Programme's (UNEP) *Adaptation Gap Report* highlights that while many countries have adaptation planning instruments in place, progress in translating plans into action remains slow and uneven, and adaptation financing, a key enabler of real progress, is far below what is needed to address climate impacts.[3] SAIs examining whether plans translate into results provide essential accountability for performance.

SAIs are also increasingly addressing foresight and emerging issues. Climate change poses existential threats to human societies, while renewable energy offers transformational economic opportunities. Both have fundamental implications for public finances and fiscal sustainability that merit SAI attention. In some cases, these implications arise not only from new spending needs but from inconsistencies between climate commitments and existing fiscal policies (such as energy taxation, subsidies, or public investment plans), which SAIs may examine using standard audit approaches.

The practice examples in this guide cover both performance and compliance audits. Neither requires rewriting audit fundamentals to address climate. Understanding context—international agreements, climate finance architecture, and climate-sensitive public financial management—remains essential. This guide builds on valuable SAI experience through ClimateScanner (coordinated by the Brazilian Federal Court of Accounts (TCU Brazil), guidance from the International Organization of Supreme Audit Institutions (INTOSAI) Working Group on Environmental Audit (WGEA), and climate change adaptation audits (coordinated by the INTOSAI Development Initiative and INTOSAI WGEA).

Four themes emerging from worldwide good practice

Analysis of climate audit reports from SAIs reveals four interlocking themes (figure 1):

1. **Focus on outcomes:** Effective climate audits focus on outcomes rather than processes. The fundamental question is not whether governance structures exist but whether they deliver measurable results—actual emissions reductions, genuine vulnerability reduction, and real ecosystem protection. SAIs examining whether climate action works, not merely whether it happens, generate the most consequential findings.
2. **Cover the whole of government:** Climate change operates across government. Specialized ministries typically control only a fraction of climate-relevant spending; most of it sits with transport, agriculture, energy, infrastructure, and finance portfolios. Audits examining only specialized ministries miss most of what matters. Effective practice traces climate responsibilities and resources across institutional boundaries, applying a whole-of-government approach.
3. **Build capacity progressively:** SAIs can use the frameworks to build climate audit capacity progressively. Not every SAI can immediately conduct sophisticated policy effectiveness evaluations. The progressive frameworks in chapters 5, 6, and 7 enable SAIs to begin by examining whether basic structures exist and move towards demanding analyses of policy coherence and measurable outcomes.
4. **Communicate effectively:** Powerful audit reports demonstrate competence, maintain integrity, inform public debate, and focus on helping governments succeed. The most consequential outputs are often not prescriptive recommendations but irrefutable factual conclusions that create their own imperative for action.

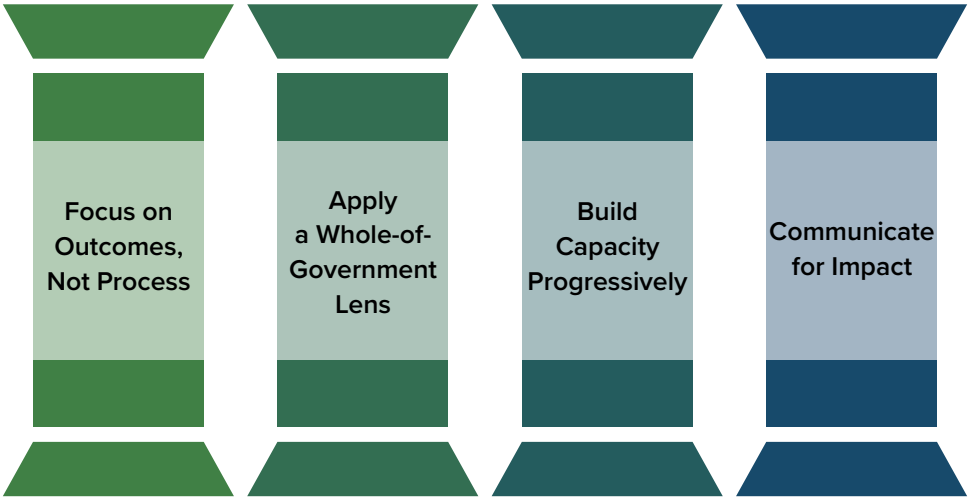
2 According to UNEP's *Emissions Gap Report 2025*, global greenhouse gas emissions reached a record high in 2024 and continue to rise overall. Current policies and commitments are leading only to marginal reductions that are far below what science indicates is needed, illustrating that many countries have made limited progress in reducing net emissions.

UNEP (2025). *Emissions Gap Report 2025: Off Target - Continued Collective Inaction Puts Global Temperature Goal at Risk*. Nairobi, Kenya. https://doi.org/10.59117/20.500.11822/48854

3 UNEP (2025). *Adaptation Gap Report 2025: Running on Empty - The World is Gearing Up for Climate Resilience — Without the Money to Get There*. Nairobi, Kenya. https://wedocs.unep.org/20.500.11822/48798

Figure 1: Four pillars of high-impact auditing

Analysis of approximately 60 climate audit reports from SAIs across all regions reveals four interlocking themes that define effective practice.



Patterns in SAI recommendations

This guide draws on analysis of approximately 60 climate audit reports from SAIs across all regions. Examination reveals consistent patterns in both the challenges SAIs encounter and the areas where they make recommendations. Table 1 summarizes the 10 most common recommendation themes:

Table 1: Most frequent recommendation themes in climate audits

Rank	Recommendation theme	Frequency	Dominant focus
1	Governance and coordination	★★★★★	Both, strongest in adaptation
2	Monitoring, reporting and accountability	★★★★★	Adaptation and mixed
3	Risk, vulnerability and impact assessment	★★★★	Adaptation
4	Data systems, indicators and standardisation	★★★★☆	Both
5	Strategic planning and implementation	★★★★☆	Adaptation
6	Legal and regulatory frameworks	★★★★☆	Mixed
7	Financing, budgeting and financial instruments	★★★★☆	Both
8	Institutional capacity and human resources	★★★☆☆	Adaptation
9	Climate-proofing infrastructure and investment	★★★☆☆	Both
10	Stakeholder engagement and transparency	★★★☆☆	Adaptation

Note: “Mixed” refers to reports that explicitly combine compliance and performance issues.

This pattern reflects both climate auditing's maturity—with foundational governance and monitoring issues still predominant—and adaptation's particular challenges, which require coordination across multiple sectors and levels of government. Recommendation frequency does not necessarily correlate with effectiveness; the progressive frameworks in chapters 5 and 6 address how SAIs move beyond process recommendations towards outcome-focused work.

Effective auditing and reporting reduce the risk that national administrations fall into the trap of goal displacement, where the original objectives of climate policies become overshadowed by processes and administrative requirements. Annex C further discusses this concept.

Within INTOSAI, responsibility for climate-related guidance is distributed: the WGEA leads on mitigation and adaptation auditing, while the Supervisory Committee on Emerging Issues addresses energy transition and fiscal sustainability implications. This guide draws on both streams of work.

How to use this guide

This guide is organized in three parts to serve SAIs at different stages of climate audit capacity:

Part 1: Understanding climate audits (chapters 1–2) provides essential context on international frameworks, climate finance architecture, and audit approaches. SAIs new to climate auditing should begin here to understand the landscape. Experienced climate auditors may use these chapters as reference material.

Part 2: Good practices comprises chapter 3 (cross-cutting good practices organized by audit cycle phases) and chapters 5–7 (progressive frameworks for mitigation, adaptation, and compliance audits).

SAIs can:

- Use chapter 3 to identify specific practices relevant to their current audit work, regardless of topic.
- Apply the progressive frameworks in chapters 5–7 to plan audit programmes, starting with foundational assessments and building towards outcome-focused work.
- Reference individual stages within frameworks to design audits at appropriate ambition levels given available resources and institutional capacity.

Part 3: Looking forward (chapter 8) examines fiscal sustainability and energy transition economics—emerging issues that cutting-edge SAIs are beginning to address. SAIs developing strategic audit plans can use this chapter to identify future audit opportunities.

The **annexes** provide supporting material, including detailed methodological guidance, examples of effective recommendations, and discussions on concepts such as goal displacement.

For resource-constrained SAIs: A good way to begin applying the guidance here can be to focus on practices marked as readily replicable, referring to section 2.6, using the global benchmarks discussed in section 3.4, and consider starting with Stage 1 and 2 assessments in the frameworks before progressing to more demanding audits.

For experienced climate auditors: The progressive frameworks can help identify gaps in previous coverage and plan next-generation audits. Chapter 8 may suggest new audit directions. The recommendation themes table in the introduction shows where SAI practices converge—areas where efforts can contribute to collective learning.

For SAIs planning cooperative audits: The examples throughout demonstrate how international cooperation and knowledge sharing multiply SAI capability, which is particularly valuable for complex topics like the fiscal implications of the energy transition.

Cross-cutting issues

Fraud and corruption risks in the energy sector: Climate finance flows through multiple channels and intermediaries—from international climate funds through national budgets to implementing agencies and ultimate beneficiaries—creating layered opportunities for diversion, misappropriation, and corruption. The multiplicity of financing sources, the complexity of eligibility criteria, and the difficulty of verifying environmental outcomes all elevate corruption risks beyond those of conventional public expenditure. However, corruption risks in climate governance are not confined to mitigation and adaptation spending. The fossil fuel sector is

characterized by concentrated rents, long-duration extraction licences, opaque subsidy structures, and close relationships between regulators and regulated entities. Extractive industries generate some of the largest integrity risks in public administration globally.

SAIs examining fossil fuel subsidies, extraction licensing, decommissioning obligations, and the allocation of carbon revenues operate in environments where the financial stakes create strong incentives for regulatory capture and rent-seeking. An audit approach that systematically tests whether climate governance structures deliver outcomes rather than merely completing procedures, for example, applying the anti-goal-displacement orientation described in section 1.3 and annex C, will highlight patterns of behaviour that may range from simple procedural displacement to deliberate manipulation. This is analogous to a zero-tolerance approach: by insisting on evidence of outcomes, SAIs create accountability that addresses the full spectrum, from inefficiency to negligence and corruption. Sections 3.11–3.13 discuss compliance risks and control design in detail; chapter 7 provides a progressive framework for compliance auditing that addresses these challenges.

Distributional issues: The distributional dimension of climate policy (sometimes discussed under the heading of "climate justice") presents both governments and SAIs with difficult challenges. The principle that those least responsible for climate change should not bear its greatest costs commands broad assent. Even if governments eliminate explicit fossil fuel subsidies and significantly increase taxation of hydrocarbons, the revenues generated are unlikely to be sufficient to compensate all those affected by both climate change itself and the transition away from fossil fuels. Governments will face choices between competing claims: between compensating workers displaced by a declining role for hydrocarbons and protecting populations whose livelihoods are destroyed by climate impacts; between reactive payments that maintain political consent and strategic investments that reduce future vulnerability. The political economy of compensation tends to favour organized, visible constituencies over dispersed, vulnerable populations.

SAIs can add value by making these trade-offs transparent and examining whether resource allocation reflects assessed vulnerability or political convenience, whether compensation is strategic or reactive, and whether the populations bearing the greatest costs of both climate change and climate policy are identified and accounted for in government decision-making. Chapter 8 examines the fiscal sustainability implications of energy transition. Analysis by the International Monetary Fund (IMF) on efficient carbon prices, incorporating climate damage, air pollution, and other externalities, implies that fossil fuels are substantially underpriced in most countries, meaning that the costs of fossil fuel use fall on populations and future generations who do not benefit proportionately from the subsidy.

Part 1:
Understanding climate audits

Photo: UNDP Nature/ vuon-quoc-gia-tram-chim-3_creds winway

CHAPTER 1

CONTEXT AND FRAMEWORK

Mitigation

Under the Paris Agreement, signatory countries prepare, communicate, and maintain[4] Nationally Determined Contributions (NDCs) at least every five years. Countries decide on actions they will take to reduce GHG emissions and communicate these to the United Nations Framework Convention on Climate Change (UNFCCC). The UNFCCC publishes a Synthesis Report on NDCs. Both the synthesis and individual NDCs form valuable resources for SAIs working on climate issues, providing central reference points for understanding national mitigation ambition, priorities, and timelines, though scope, legal status, and specificity vary considerably across countries.

Key feature of NDCs

- Mitigation targets (economy-wide or sectoral) with timelines
- Adaptation priorities and actions
- Implementation means (policies, financing, capacity building)
- Updates at least every five years with progressive ambition

Currently, collective NDC ambition is, according to UNEP's *Emissions Gap Report 2025*, insufficient to keep global temperatures within the Paris Agreement limits (1.5°C above pre-industrial levels). Current projections suggest temperature increases closer to 2.5°C. This gap between stated commitments and required reductions underscores the importance of assessing whether national mitigation plans are credible, internally consistent, and supported by effective implementation policies.

Each Annex 1 Paris Agreement signatory produces an annual GHG inventory, submitted by 15 April, following common guidelines. These inventories provide comprehensive accounting of anthropogenic emissions and removals. Non-Annex I parties are required to submit their first National Communication within three years of entering the Convention, and every four years thereafter.

For many SAIs, GHG inventories represent one of the most mature and standardized quantitative data sources for examining mitigation-related claims, trends, and consistency over time.

Adaptation

National Adaptation Plans (NAPs) submitted to the UNFCCC outline medium- and long-term adaptation needs, strategies, programmes, and priorities. NAPs aim to reduce vulnerability to climate impacts, build adaptive capacity and resilience, and facilitate the integration of climate adaptation into relevant policies, programmes, and activities. They also provide insight into government adaptation priorities, institutional arrangements, and intended financing approaches.

Key features of NAPs

- Identification of climate risks (floods, droughts, sea-level rise, heatwaves)
- Prioritization of vulnerable sectors (agriculture, water resources, health, infrastructure, coastal zones)
- Planned adaptation actions (resilient infrastructure, climate-resilient crops, early-warning systems, water management)
- Integration of climate adaptation into national development, planning, and budgeting policies
- Guidance for investments from public budgets, development banks, and international climate funds (e.g. the Green Climate Fund)

4 That is, keep the current approach.

Unlike mitigation, adaptation lacks globally standardized reporting systems equivalent to GHG inventories. NAP quality, specificity, and implementation status vary significantly across countries, with implications for how SAIs can check adaptation progress.

1.1 Financial architecture: Climate finance and national budgets

Climate action is financed through both international climate finance flows and domestic budget allocations, creating a complex financial architecture that SAIs need to understand when examining climate expenditure.

Key features of greenhouse gas inventories

- Standardized format following IPCC guidelines
- Mitigation targets (economy-wide or sectoral) with timelines
- Sector-level disaggregation (energy, industrial processes, agriculture, land use, waste)
- Time series data enabling trend analysis
- Transparency in methods, data sources, and uncertainty

International climate finance flows through multiple channels. The Green Climate Fund (GCF) and Global Environment Facility (GEF) represent the main multilateral climate funds established under UNFCCC frameworks, alongside the Adaptation Fund, which supports concrete adaptation projects in developing countries, particularly those most vulnerable to climate impacts. Multilateral development banks—including the World Bank, regional development banks, and IMF—increasingly incorporate climate considerations into lending and provide dedicated climate finance facilities, including diagnostic tools such as the IMF–World Bank Climate-Public Investment Management Assessment (C-PIMA) and financing instruments such as IMF's Resilience and Sustainability Facility, which supports longer-term climate and resilience reforms. Bilateral climate finance flows directly from developed to developing countries, sometimes counted towards donors' commitments to mobilize US$100 billion annually (a commitment first made in 2009 and extended through subsequent COPs).

These international flows create audit challenges. Funds often bypass national budget systems, being disbursed directly to implementing agencies or non-governmental organizations. Multiple reporting frameworks exist, with inconsistent definitions of what constitutes "climate finance". The same expenditure may be reported by donor countries, recipient countries, multilateral institutions, and implementing organizations, creating potential for double counting. Tracking whether international climate finance is additional to existing development assistance or represents relabelling of traditional aid remains contentious.

SAIs examining climate finance must often trace funds across international transfers, national budgets, subnational allocations, and implementing entities—with each transfer potentially subject to different reporting standards, disbursement timelines, and accountability frameworks.

Domestic climate finance increasingly operates through climate-responsive budgeting systems. Many countries have undertaken significant efforts to integrate climate dimensions into national budgets, including climate budget tagging and climate-sensitive public investment management. Climate budget tagging identifies and codes budgetary resources and expenditures related to climate objectives, representing efforts to address climate priorities within existing budget structures. Similar tagging approaches have previously been applied to other cross-cutting policy priorities, such as gender equality.

International reviews provide evidence that climate-responsive budgeting reforms have contributed to improved awareness and transparency and, in some cases, increased allocations to climate-related activities. However, a 2021 World Bank review of climate budget tagging experience found that the main benefits relate to awareness-raising and improved transparency and accountability, with limited evidence that generated data are analysed or used consistently to inform resource allocation decisions. The review highlighted the need for stronger institutional incentives and analytical capacity to move from tagging towards decision-relevant use of information.

An Organisation for Economic Co-operation and Development (OECD) paper[5] similarly identified the need to go beyond tagging and introduce additional tools to ensure alignment between national climate plans, medium-term budget frameworks, and annual budgets. Meanwhile, a recent United Nations Development Programme (UNDP) study[6] highlights a mixed picture and identifies many areas for improvement, including the role of audit and evaluation.

Across jurisdictions, audit work reflects similar challenges, with climate budget tagging often functioning primarily as a reporting or classification exercise rather than as a tool that meaningfully informs prioritization, trade-offs, or assessments of value for money.

Auditors thus have an important role in assuring parliaments and civil society that these arrangements lead to changes in spending patterns, that different parts of government are working coherently towards shared climate goals, and that climate finance—whether international or domestic—achieves measurable environmental outcomes. Audit of climate-related commitments and expenditures can be instrumental in ensuring effectiveness.

Interviews with audit teams revealed challenges in dealing with broad objectives financed through climate budget tagging. Administrators may continue seeing their priority as servicing historic functions (such as agriculture ministries providing climate-relevant support to farmers). In some countries, climate tagging will not appear in the main budget documents, potentially leading SAIs to give less attention to climate themes than they would to an explicit budget priority.

Revenue dimension

Climate policy is not only about how governments spend money but also about how they raise it and how tax systems influence behaviour. Tax instruments are central to the economics of climate action and represent important audit entry points for SAIs with mandates covering revenue. Some common key tax instruments are carbon taxes, fuel excise duties, environmental fees and levies, vehicle and transport taxes, tax expenditures (incentives), and related measures.

"Climate tagging—as currently practiced—puts too much emphasis on the quantification of climate-related expenditures, with inadequate consideration of policy alignment, efficiency, and effectiveness."

World Bank (2021). Climate Change Budget Tagging: A Review of International Experience. EFI Insight–Governance.

Why tax instruments matter for climate audits:

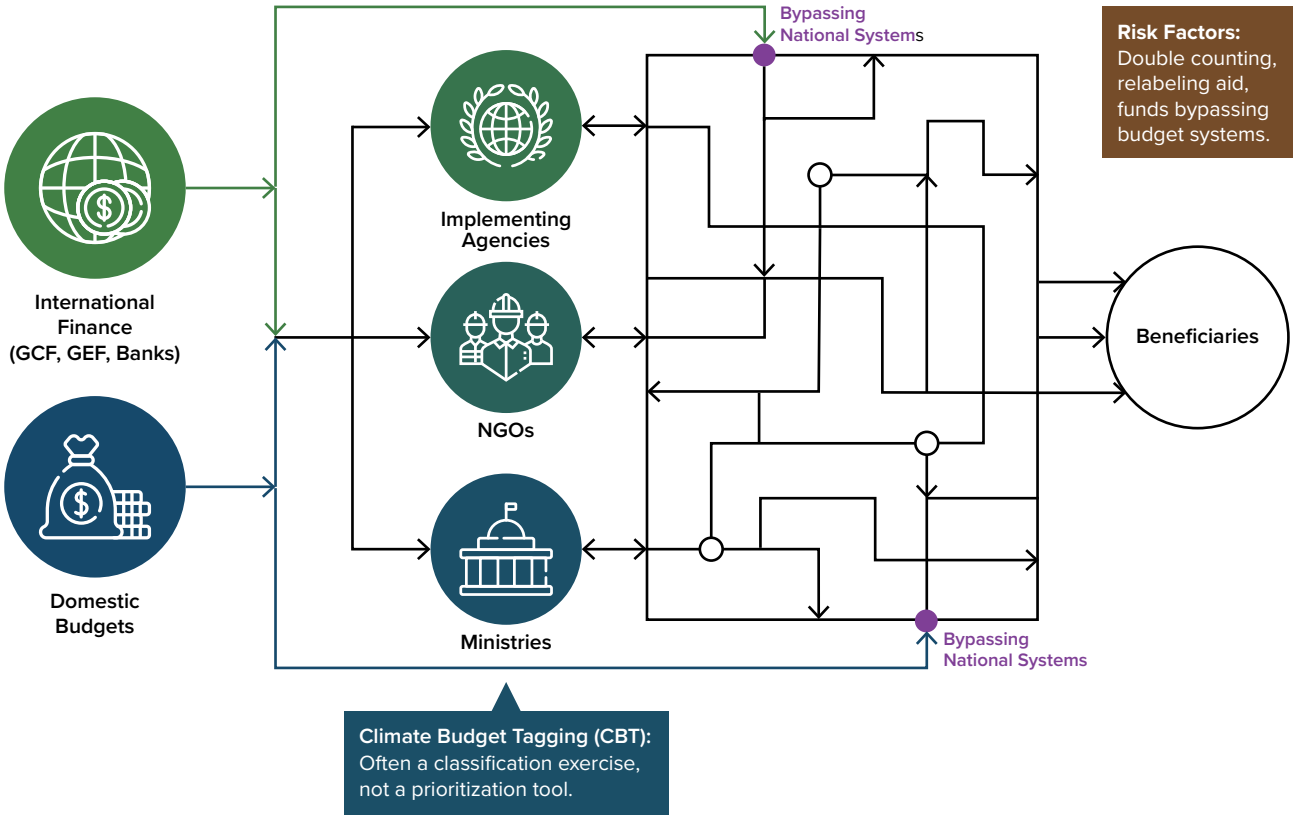
- **Policy coherence:** Tax expenditures that subsidize fossil fuels directly contradict carbon pricing or renewable energy support. These contradictions are auditable using standard tax expenditure analysis.
- **Revenue sustainability:** Countries relying on fuel excise face structural revenue decline as transport electrifies. Auditors can examine whether governments have assessed this risk and developed replacement revenue strategies.
- **Behavioural impact:** Taxes shape investment and consumption decisions. Auditors can assess whether tax settings are consistent with stated behavioural objectives
- **Enforcement:** Environmental fees and carbon pricing mechanisms depend on effective enforcement. Compliance audits can examine whether collection and enforcement systems function as intended.
- **International frameworks:** OECD's Inventory of Fossil Fuel Support and IMF subsidy databases provide benchmarks for comparing domestic tax expenditures. The Public Expenditure and Financial Accountability (PEFA) Climate module (2025) includes indicators on climate-responsive revenue policy.

Figure 2 illustrates the structure of the financing architecture.

5 OECD (2024). *Beyond Green Tagging: How Can Public Budgeting Support Climate Goals?* Volume 2024/06. https://www.oecd.org/en/publications/beyond-green-tagging_b154d49b-en.html

6 UNDP (2025). Study On Effectiveness Of Climate Public Financial Management. https://www.undp.org/asia-pacific/publications/study-effectiveness-climate-public-financial-management

Figure 2: Structure of the financing architecture



1.2 The mitigation and adaptation challenge

Strong public pressure frequently exists for governments to devote resources to adaptation—particularly reactively following disasters. Where adaptation takes infrastructure forms, it provides visible potential benefits to local communities (adaptation through behaviour change, such as ending or reversing deforestation, may be less welcome, even if more effective). How effective adaptation measures will prove when facing future challenges is difficult to determine. As the UNDP report on the effectiveness of climate action points out,[7] adaptation outcomes are harder to assess than those of mitigation. Adaptation requires prediction across a range of future scenarios arising from changing weather patterns and extreme weather events.

No degree of adaptation suffices unless the world tackles mitigation. When SAIs examine measures national administrations take to meet Paris Agreement commitments, they can play a key role in advancing mitigation action. Achieving international commitments requires both administrative coordination and policy coherence. Starting with observations that, for example, encouraging renewable energy uptake while simultaneously providing fossil fuel subsidies makes the energy transition slower and more expensive, SAIs can encourage better and more coherent resource use. This guide therefore discusses the route from organizational coordination to optimal resource deployment.

7 Ibid.

1.3 Avoiding goal displacement

Identifying and addressing goal displacement

- **Ask outcome-focused questions:** Has the programme reduced climate risk or emissions, or only completed procedural steps? Do coordination mechanisms produce substantive decisions or primarily meeting records?
- **Look for evidence of displacement:** This can include high plan completion rates but low action implementation rates, comprehensive reporting systems with no evidence that information influences decisions, and the celebration of process milestones without referencing outcomes.
- **Compare resource allocation against risk priorities:** If adaptation spending does not align with the needs of the most vulnerable populations, factors other than outcome achievement are driving decisions.
- **Make specific recommendations:** Avoid vague recommendations like "improve coordination" that may lead to more meetings without better outcomes. Recommend measurable outcome indicators, link resources to demonstrated results, and establish consequences for programmes that meet process requirements but fail to deliver environmental outcomes.

Effective procedures and accountability systems are essential for coordinating climate action and ensuring resources reach the intended beneficiaries. However, when SAIs examine climate programmes, they frequently encounter examples of goal displacement (see annex C), where the original objectives (reducing emissions, building resilience, and protecting ecosystems) become overshadowed by the processes established to achieve them. Public bodies can prioritize completing procedural steps (developing plans, establishing committees, and submitting reports) over delivering actual climate outcomes (measurable emissions reductions and reduced vulnerability).

Goal displacement in climate policy emerges from several dynamics. Long timeframes create incentives to substitute easily measured process indicators ("plan completed") for difficult-to-verify outcome indicators ("risk reduced"). Measurement challenges make organizations gravitate towards measuring what is easy. Multiple governance layers mean international reporting requirements may become *de facto* goals rather than tools for tracking progress. Finally, political incentives favour announcing plans over publishing results (figure 3).

Audits examining mitigation progress have documented sophisticated governance structures alongside weak delivery—advanced organizational implementation with little actual emissions reduction. Adaptation audits have found governments celebrating procedural milestones while vulnerable populations remain exposed to intensifying climate risks. Climate finance audits have revealed expenditure reported as success regardless of whether funds achieved measurable environmental outcomes.

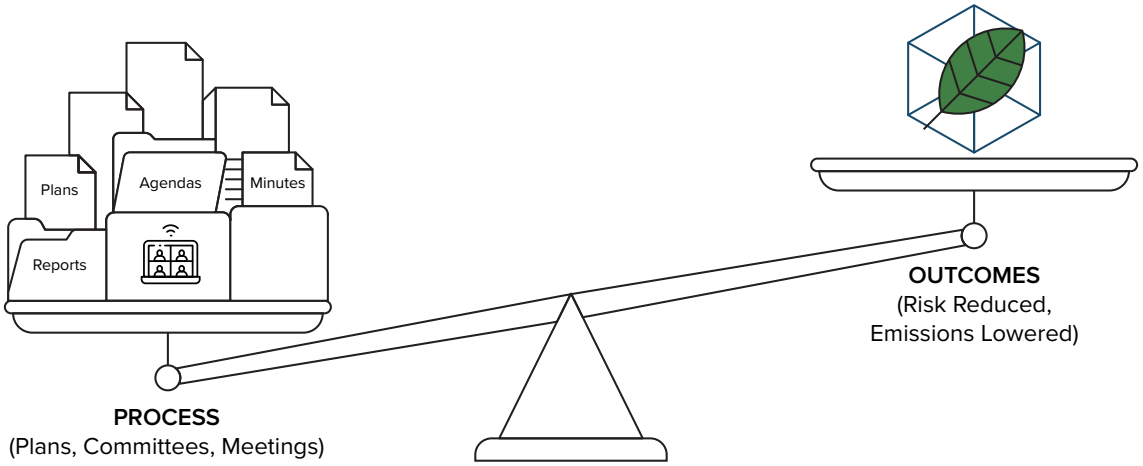
Annex C further discusses goal displacement and provides examples from audit practice. The good practice approaches throughout this guide provide ways SAIs can identify goal displacement risks and design audits that focus on achieving climate outcomes.

1.4 Foresight: Energy, fiscal sustainability, and climate action

Many people speak and behave as if climate change will only affect their grandchildren. However, people living close to nature know that it is already affecting their lives. Food prices have been a significant political issue in many countries. An underappreciated reason for rising food prices is the impact of climate change and extreme weather events. Similar processes are at work in the insurance market.

A positive element in the overall scenario is that renewable energy is rapidly undercutting and outperforming fossil fuel. This benefits countries dependent upon fossil fuel imports. In some countries, such as Pakistan, market forces are driving rapid renewable energy uptake with significant economic impacts. Other early adopters of large-scale renewable energy are finding that cheaper energy sources provide new opportunities. They can benefit in terms of growth, improved energy security, and reduced dependence on suppliers.

Figure 3: Goal displacement in climate policy



The Trap: Substituting easy-to-measure activities for hard-to-measure results.

Changes in energy sourcing will affect public finances in all parts of the world: fossil fuels are easier to tax than solar panels. Specific challenges exist for countries dependent on fossil fuel exports for a large revenue share, most urgently for countries where extraction costs are highest. SAIs that have carved out roles in foresight and identifying emerging issues have much to consider in the future of fossil fuel extraction: future revenues, decommissioning costs, and stranded assets. SAIs may also examine whether these risks are integrated into medium-term fiscal frameworks, debt sustainability analysis, and fiscal risk statements, and whether transition-related public investments are aligned with long-term fiscal sustainability objectives.

Climate-related fiscal risks (contingent liabilities from disasters, revenue volatility from energy transition, and decommissioning obligations) are often long-term, uncertain, and not captured in traditional budget and financial reporting frameworks, making them difficult for governments to identify. This increases the significance of audit work. Chapter 8 explores these issues in more detail, including how SAIs can examine coherence between climate commitments and fiscal policy choices. Although the political benefits of visible climate action vary between countries and over time, the incentive to be seen as doing something is high. SAIs play the important role of providing accountability and independent appraisal of the choices made, providing assurance that rational decisions are being taken.

CHAPTER 2

CLIMATE AUDIT APPROACHES

2.1 Evolution of climate audits and the enabling environment

Climate audits have evolved significantly. Early audits focused primarily on whether governance structures existed. More recent audits examine policy coherence, spending effectiveness, and actual outcomes achieved. This evolution reflects both SAI capacity development and recognition that parliaments and finance ministries increasingly need assurance not just that procedures exist, but that spending delivers emissions reductions, resilience gains, and prudent management of long-term fiscal exposures. INTOSAI WGEA guidance was issued in 2010, which remains valuable, largely reflected audit practice from well-resourced SAIs.[8]

The Paris Agreement expanded international climate action commitments, contributing to a significant increase in the number of SAIs addressing climate issues.

The ClimateScanner exercise was announced at INCOSAI Brazil in November 2023 (box 1). In parallel, the INTOSAI Development Initiative and INTOSAI WGEA cooperated on the Global Cooperative Audit of Climate Change Adaptation Actions (CCAA) (box 2).[9]

These exercises have further increased the number of SAIs auditing climate change. Today, a majority of SAIs worldwide have examined climate issues in their audits.

Box 1: ClimateScanner: A global starting point for climate accountability

ClimateScanner is a collaborative INTOSAI initiative, led by the Tribunal de Contas da União (TCU) of Brazil, that provides SAIs with a practical starting point for engaging with climate change issues. Conceived as a diagnostic rather than an audit, it supports SAIs in building an initial, structured understanding of how governments are organizing their response to climate change.

The tool explores three interlinked pillars—governance, public policy, and climate finance—through a standardized self-assessment questionnaire. SAIs map institutional responsibilities, coordination mechanisms, policy frameworks, and financial arrangements, generating a baseline picture tailored to national circumstances while remaining comparable across countries.

ClimateScanner's principal strength lies in its orientation towards learning and prioritization. National results help SAIs identify gaps, clarify audit entry points, and inform medium-term audit strategies, while aggregated findings reveal shared challenges and emerging practices globally. By lowering the threshold for engagement and encouraging broad participation, ClimateScanner strengthens the collective evidence base on climate governance and reinforces the role of SAIs as informed, credible actors at the outset of climate accountability journeys.

8 INTOSAI (2010). *Auditing the Government Response to Climate Change: Guidance for Supreme Audit Institutions*. https://www.digar.ee/arhiiv/en/books/21333

9 INTOSAI (n.d.). *What Is the Global Audit of Climate Change Adaptation Actions?* https://idi.no/our-work/initiative/ccaa/ccaa-what/

Box 2: IDI/INTOSAI WGEA Global Coordinated Audit on Climate Change Adaptation Actions

The INTOSAI Development Initiative (IDI)/INTOSAI WGEA Global Coordinated Audit on Climate Change Adaptation Actions represents a foundational step in building SAI capacity to audit one of the most complex dimensions of climate action. It brings together SAIs from diverse regions to examine how governments are preparing for climate risks, using a shared framework that supports learning while respecting national mandates and contexts.

Participating SAIs conducted adaptation-focused audits addressing issues such as risk assessment, planning, coordination, implementation, and monitoring. The coordinated design enabled SAIs to develop common analytical approaches and vocabularies, often for the first time, while producing nationally relevant findings.

At the national level, it strengthened technical understanding of adaptation and created platforms for dialogue with governments. At the global level, the synthesis highlighted recurring constraints, such as fragmented governance, data limitations, and financing challenges, alongside illustrative practices. Overall, the coordinated audit demonstrated how collective approaches can catalyse capability, confidence, and future audit work, positioning SAIs to engage with climate adaptation.

In 2024, the INTOSAI Working Group on Extractive Issues (WGEI) surveyed members on their experience of auditing the energy transition.[10] The responses indicated that a group of SAIs had experience in this field, particularly in relation to energy infrastructure and renewable energy.

Evolving expectations for climate and sustainability reporting

Climate audits now operate in a rapidly changing reporting landscape. Several developments have fundamentally altered what governments and public sector entities are expected to disclose and how SAIs can assess those disclosures.

The Task Force on Climate-related Financial Disclosures framework, established in 2015, created structured approaches for organizations to disclose climate-related risks and opportunities. While initially developed for private sector financial reporting, its principles increasingly apply to public sector entities. The framework requires disclosure across four areas:

- Governance (how boards and management oversee climate risks)
- Strategy (actual and potential climate impacts on business and strategy)
- Risk management (how organizations identify and manage climate risks)
- Metrics and targets (what organizations measure and what targets they set)

The International Sustainability Standards Board, established in 2021, has developed comprehensive sustainability disclosure standards. IFRS S1 (General Requirements for Disclosure of Sustainability-related Financial Information) and IFRS S2 (Climate-related Disclosures) represent efforts to create globally consistent, comparable, and reliable sustainability information. These standards are being adopted or adapted by securities regulators and stock exchanges worldwide, creating momentum for convergence in public sector reporting approaches.

For the public sector specifically, the International Public Sector Accounting Standards Board delivered its first climate-related sustainability reporting standard in December 2025. While still emerging, these standards will establish expectations for how governments report climate-related information alongside financial statements. Some jurisdictions are already moving in this direction, requiring climate risk statements in budget documentation, disclosing climate-related contingent liabilities in financial reports, and publishing climate expenditure tracking alongside traditional fiscal reporting.

10 INTOSAI WGEI (2024). *2024 WGEI Energy Transition Survey.* https://wgei.org/publications/

These developments create both opportunities and challenges for SAIs. On one hand, standardized frameworks provide clearer audit criteria and enable comparison across jurisdictions and over time. On the other hand, reporting standards are evolving rapidly, creating uncertainty about what constitutes compliance. Standards developed for private sector financial reporting may not translate directly to public sector contexts where objectives include equity, resilience, and long-term sustainability rather than shareholder value. Resource-constrained SAIs must build capacity to audit against frameworks that continue to evolve and may require different technical expertise than traditional financial or performance auditing.

Particularly significant for climate compliance audits (discussed in chapter 7) is the expansion from Scope 1 emissions reporting (direct emissions from owned or controlled sources) to comprehensive Scope 1, 2, and 3 disclosure (including indirect emissions from purchased energy and entire value chains). What constituted adequate reporting five years ago may be considered incomplete today. SAIs examining climate reporting compliance must determine whether to assess against the standards in effect when legislation was drafted or against current reporting expectations, a question with significant implications for audit findings.

2.2 Performance audits and compliance audits

Performance audits of climate action examine whether government undertakings are efficient, effective, and economical. They assess whether objectives have been achieved and whether value for money has been obtained. Examples include audits examining whether renewable energy subsidies achieved projected emissions reductions, whether adaptation investments reduced vulnerability as intended, and whether governance structures enable effective climate action.

Compliance audits provide assurance on whether actions comply with applicable policies, standards, or authorities. In the climate context, this includes compliance with international agreements, such as the Paris Agreement and UNFCCC reporting requirements, compliance with domestic climate legislation and regulations, and financial compliance in the use of climate finance.

Both audit types are valuable and often complement each other. A compliance audit may reveal that the government submitted required emission reports on schedule, demonstrating procedural compliance, while a performance audit examining the same area may show that reported emissions are rising rather than falling, indicating a substantive failure to achieve legislative intent.

2.3 Relevance of a whole-of-government approach

Delivering climate change mitigation and adaptation requires coordinated effort across many public sector entities, including central government, subnational governments, and state-owned enterprises. One feature of the audits examined in preparing this guide is the significant role of coordination issues. International organizations share this concern about whole-of-government challenges. Chapter 1 of OECD's 2025 *Government at a Glance* report[11] addresses governing for the green transition, providing useful analysis of arrangements in OECD countries and pointing to the potential role of SAIs.

This guide focuses on auditing government climate policies and programmes. Achieving impact requires that these policies influence the activities of the private sector. Taken together, they create the conditions in which private actors invest, comply, and innovate. SAIs add value by examining whether the government's framework for engaging the private sector achieves intended outcomes. Key audit questions include whether incentive schemes, such as tax credits, subsidies, and feed-in tariffs, reach intended beneficiaries and change behaviour, or are captured by actors who would have invested regardless, whether public-private partnerships for climate infrastructure allocate risk appropriately and protect the public interest; whether regulatory oversight of private sector emissions reporting is adequate to detect underreporting; and whether carbon market design prevents gaming and ensures genuine emissions reductions. The compliance framework in chapter 7 addresses government oversight of private sector compliance. Sections 3.8 and 3.11 examine policy coherence and control design in schemes targeting private behaviour.

11 OECD (2025). *Government at a Glance 2025.* https://www.oecd.org/en/publications/government-at-a-glance-2025_0efd0bcd-en.html

Across the countries reviewed by SAIs, a consistent pattern emerges: ministries with formal responsibility for climate change, typically environment or climate ministries, control only a small share of public expenditure recorded as climate related. OECD has found that subnational governments account for the largest share of climate-significant public spending.[12] The European Court of Auditors has similarly noted that most spending recorded as climate positive passed through agriculture budgets and departments.

Budget-tagging exercises from Europe, Latin America, and Asia indicate that the bulk of climate-significant spending is implemented by sectoral ministries such as transport, public works, agriculture, energy, and finance.

As climate ministries do not directly control most climate-related expenditure, ensuring that public spending achieves maximum impact becomes more difficult. Large investments are often driven by sectoral priorities rather than climate value-for-money assessments. Tracing changes in net emissions, particularly changes attributable to specific measures, is more difficult than tracing cash flows. OECD has noted that climate-screening of spending programmes is rare in OECD countries.[13]

To support whole-of-government climate outcomes, international fiscal institutions have developed tools that span the public financial management cycle. IMF has articulated a green public financial management (PFM) framework, which proposes mainstreaming climate considerations across strategic planning, budget preparation, execution, and oversight as part of climate-sensitive public financial management.[14] Under this broader approach, the Climate-Public Investment Management Assessment (C-PIMA) module assesses how effectively climate change mitigation and adaptation considerations are integrated into public investment planning and budgeting processes.[15] Complementing these fiscal tools, UNDP's guidance on using public financial management to implement NDCs and NAPs outlines entry points for aligning budget frameworks, expenditure tracking, and performance monitoring with national climate goals.[16] These frameworks emphasize the need for coordination, transparency, and integration of climate priorities across ministries, subnational governments, and PFM functions to enhance climate performance and accountability.

"The aspect of green budgeting in which OECD countries perform most poorly on average is Accountability and Transparency. Only 40 percent of surveyed OECD countries have implemented oversight mechanisms for green objectives or reporting by an independent body such as an independent fiscal institution, climate advisory body or council, or auditor general…it is important that governments move beyond green budgeting tagging, which simply marks expenditures as being positive, negative or neutral for the environment (OECD, 2024), and towards directly assessing and measuring the impact of budget proposals on emissions".

OECD (2025), Government at a Glance 2025.

12 OECD (2022). *Subnational Government Climate Expenditure and Revenue Tracking in OECD and EU Countries.* OECD Regional Development Papers, No. 32. https://www.oecd.org/en/publications/subnational-government-climate-expenditure-and-revenue-tracking-in-oecd-and-eu-countries_1e8016d4-en.html

13 OECD (2025). *Government at a Glance 2025*. https://www.oecd.org/en/publications/government-at-a-glance-2025_0efd0bcd-en.html

14 IMF (2022). *How to Make the Management of Public Finances Climate-Sensitive – "Green PFM"*. IMF How To Notes, No. 2022/006. https://doi.org/10.5089/9798400221682.061

15 IMF (2024). *Jordan: Climate Module of the Public Investment Management Assessment and Green Public Financial Management.* High-Level Summary Technical Assistance Report No. 2024/019. https://doi.org/10.5089/9798400276354.029

16 UNDP (2025). *Using Public Financial Management to Implement NDCs and NAPs*, Guidance Note, August 2025. https://www.undp.org/publications/using-public-financial-management-implement-ndcs-and-naps

"Half the EU's reported climate spending is related to agriculture. A 2021 ECA report notes that GHG emissions from farming in the EU have not decreased since 2010. Modelling studies on climate change mitigation suggest that without direct payments, EU GHG emissions from agriculture would be 2.5–4.2 percent lower."

(ECA 2)

Effective climate action requires more than isolated interventions. Adopting a whole-of-government perspective enables SAIs to examine how responsibilities, resources, and policies across ministries, subnational governments, and state-owned entities interact in the delivery of climate mitigation and adaptation outcomes. This approach allows auditors to assess not only individual programmes but also coordination, policy coherence, allocation of resources, and cumulative impact, providing a clearer picture of whether public interventions collectively achieve national climate goals.

Chapter 3 discusses how SAIs have applied whole-of-government approaches in practice.

2.4 Challenges in undertaking climate audits

SAIs conducting climate audits encounter several recurring challenges.

Data availability and quality: Climate data may be incomplete, inconsistent across agencies, or collected using different methodologies. Relevant data sources often differ substantially from financial records and administrative documents that form the basis of traditional audits.

Timeframes and attribution: Climate policies operate over decades. Outcomes may not be visible within typical audit cycles and may result from the interaction of multiple policy interventions. This makes it more difficult to determine whether specific policies caused observed changes and to assess effectiveness. Successful action requires coordination across different spending programmes, regulation, and market measures. Convincing counterfactual analysis is rarely possible.

Technical complexity: Climate science, energy systems, and climate economics involve specialized knowledge that audit teams must develop or access through external expertise.

Cross-cutting nature: Climate issues cut across traditional government silos, making comprehensive audit difficult without examining multiple sectors and levels of government. A whole-of-government approach becomes essential.

Political sensitivity: Climate policies can be politically contentious. SAIs need to produce high-quality work to maintain independence while providing objective assessments.

Rapidly evolving standards: As discussed in section 2.1, reporting frameworks, disclosure requirements, and technical standards for measuring climate impacts continue to evolve. What constituted good practice or adequate compliance several years ago may no longer meet current expectations. This creates uncertainty about appropriate audit criteria and makes it more difficult to assess long-term policy effectiveness when measurement approaches change.

SAIs around the world have demonstrated the ability to adapt standard audit approaches to meet these challenges. The progressive frameworks in chapters 5, 6, and 7 provide examples of how SAIs have addressed them in practice.

2.5 Key opportunities: Using global benchmarks

For many SAIs, making effective use of existing global benchmarks represents a quick win in improving the value of published climate reports. Section 3.4 identifies several global benchmarks and indices that SAIs have used effectively, including:

- The Notre Dame Global Adaptation Initiative (ND-GAIN) Country Index for comparing vulnerability and readiness
- The Global Climate Risk Index for quantifying the impacts of weather-related events
- International Energy Agency (IEA) data on renewable energy deployment and energy transition progress
- Intergovernmental Panel on Climate Change (IPCC) Assessment Reports providing authoritative scientific consensus
- The Climate Change Performance Index tracking national mitigation efforts

Several reports examined in preparing this guide would have had greater impact had they drawn on a wider range of global benchmarks. These benchmarks enable SAIs to:

- Compare national performance against peers facing similar challenges
- Verify government claims against independent data
- Identify whether national trends align with or diverge from global patterns
- Provide context showing whether observed problems are unique to the country or reflect widespread challenges

Chapter 3 provides examples of reports where SAIs have applied these benchmarks effectively.

2.6 Guidance for resource-constrained SAIs

Resource-constrained SAIs have repeatedly demonstrated that high-quality climate audit work does not require unlimited budgets or large teams. The challenge for all SAIs lies in building skills progressively, leveraging freely available international data, and sharing methodology with peer institutions.

Starting points for resource-constrained contexts

The progressive frameworks in chapters 5, 6, and 7 enable SAIs to begin with Stage 1 assessments, examining whether governance structures exist and whether basic data systems function, before advancing to more sophisticated evaluations of effectiveness. Early-stage audits establish institutional credibility and build team capacity while delivering genuine value by identifying foundational gaps that governments need to address before complex policies can succeed.

Maximizing impact with limited resources

Several approaches have proven effective for resource-constrained SAIs:

- **Exploit freely available global data:** Annex A catalogues benchmarks, databases, and tools accessible at no cost. The ND-GAIN vulnerability index, UNFCCC national reporting, satellite imagery from Sentinel and Landsat, IEA energy data, and OECD subsidy inventories provide authoritative evidence that SAIs can access directly. Section 3.4 discusses how SAIs have used these effectively.
- **Use purposive sampling with clear criteria:** Tanzania's desertification audit and Maldives' coastal ecosystem work demonstrate that strategic site selection based on objective risk criteria can deliver robust findings without requiring comprehensive geographic coverage. Section 3.7 provides examples of low-cost satellite imagery applications.

- **Participate in cooperative audits:** The IDI/INTOSAI WGEA Climate Change Adaptation Audit framework (see section 2.1) and ClimateScanner exercise enable SAIs to benefit from shared methodology, peer learning, and technical support. Cooperative approaches reduce the resource requirements for individual SAI while building collective knowledge. Pacific SAIs' regional collaboration on adaptation sequencing exemplifies this approach.
- **Focus on what can be verified independently:** Audit evidence that survives institutional reorganization, such as satellite-verified outcomes, independently measured emissions data, and fiscal liabilities documented in international databases, has particular value. Resource-constrained SAIs benefit from focusing on verifiable facts.
- **Build capacity progressively through audit work itself:** Good practice includes starting with document review and stakeholder interviews, then adding physical site verification as confidence grows, and incorporating satellite imagery analysis and global benchmark comparisons as team skills develop. Each successive audit builds institutional knowledge. Section 3.3 discusses progressive capacity building.

Addressing data and system limitations

Where government data systems are weak or non-existent, this finding itself constitutes valuable audit output. Documenting that a government lacks basic climate data, cannot track climate spending, or has no system for monitoring policy implementation provides essential accountability. Tanzania's finding that the Prime Minister's Office lacked updated desertification statistics, making programme performance measurement impossible, exemplifies how identifying data gaps can drive improvement.

Where government monitoring systems are inadequate, SAIs can leverage international data sources as partial substitutes. Satellite imagery can independently verify land-use change, forest cover, and coastal erosion regardless of domestic data capacity. UNFCCC inventories, IEA energy statistics, and global climate indices provide baselines for assessing national performance even when domestic systems are weak.

Where technical capacity constraints prevent sophisticated analysis, SAIs can focus on identifying fiscal risks that require minimal specialized expertise. Section 8.2's guidance on fossil fuel subsidy transparency and decommissioning liability disclosure shows that comparing budget documents against OECD databases, tasks achievable for resource-constrained SAIs, can reveal material exposures not captured in government financial statements.

Learning from peer institutions

Resource-constrained SAIs benefit substantially from examining how comparable institutions have approached similar challenges. Spain and Portugal's joint desertification audit, Pacific SAIs' cooperative adaptation work, and Tanzania's strategic use of satellite imagery all demonstrate approaches that maximize impact given realistic resource constraints. International cooperation through INTOSAI WGEA, IDI programmes, and regional SAI networks provides access to methodology and peer support that individual SAIs could not generate independently.

The guidance throughout this document assumes that SAIs will adapt approaches to their specific contexts and resource levels. Where particular techniques require capabilities beyond current capacity, SAIs can note this limitation transparently while still delivering valuable findings based on what can be verified with available resources and expertise.

This chapter provides auditors with understanding of how climate auditing has evolved, the reporting landscape in which it operates, the distinctive characteristics of performance and compliance approaches, the imperative of a whole-of-government perspective, and the challenges and opportunities that shape audit design, particularly for resource-constrained SAIs. Chapter 3 builds on this foundation by presenting 15 aspects of good practices drawn from actual SAI experience, organized by phase of the audit cycle and illustrated with concrete examples of what worked and why.

Part 2:

Good practices in climate auditing

Photo: Ramier Miranda / PG-ENRO, Pampanga

CHAPTER 3

GOOD PRACTICES IN CLIMATE CHANGE PERFORMANCE AND COMPLIANCE AUDITS

The good practices in this guide cover both performance and compliance audits. Neither type of audit requires the rule book to be rewritten to cover climate change issues. In both cases, it is essential to understand the background, including the international agreements in place and the role of climate finance and climate-sensitive PFM. This guide therefore gives attention to reviewing the area, building on the valuable experience many SAIs have gained through participation in the ClimateScanner exercise and Climate Change Adaptation audits, both of which are outlined in section 2.1 above. The INTOSAI Working Group on Environmental Audit has also provided valuable guidance on which this guide draws.

This chapter is organized around 15 good practices that emerge from audit experience worldwide. These practices apply to both performance and compliance audits, although their application differs by audit type.

Throughout this guide, parenthetical references identify the SAI reports from which examples and good practices are drawn. Where a country has contributed more than one report, these are numbered (e.g. Australia 1, Australia 2). Certain reports are from subnational audit institutions (Australia 2 is from New South Wales). Full bibliographic details are in the bibliography.

Preparation and scoping

Establishing the foundation: Understanding the landscape before detailed audit work begins

Effective climate audits begin with comprehensive preparation. SAIs conducting climate audits typically undertake broad reviews to understand national climate action holistically, identify priority areas for audit, and build the technical foundation necessary for credible findings. This reflects the challenges outlined in chapter 2, including fragmented data, cross-cutting governance, technical complexity, and political sensitivity. These preparatory steps create the context within which detailed audit work is undertaken and help ensure that audit resources are directed to areas of greatest risk and potential impact.

Approach and principles

Core principles that shape how climate audits are conducted

Climate audits require careful attention to outcomes and the progressive development of institutional capacity. SAIs apply these principles throughout the audit cycle.

3.1 Begin with an overall review to identify strengths, gaps, and audit priorities using multiple sources of evidence

Performance: A common theme across climate audit guidance is that SAIs begin with an overall review of the area. ClimateScanner provides a framework for reviewing mitigation. The IDI/INTOSAI WGEA CCAA covers adaptation arrangements, and energy transition guidance recommends scene-setting work at the outset of a report. Starting with a broad review helps SAIs align their work with national climate strategies and ensures audits focus on areas of greatest policy relevance and potential impact. By linking findings to overarching national objectives,

such reviews provide essential context for interpreting results and highlighting gaps between commitments and progress.

Such reviews provide SAIs with an overall understanding of national progress towards NDCs (mitigation) and climate threat response (adaptation), the scale and the sources of resources applied to mitigation and adaptation, and, ideally, the resources applied to activities that encourage continued dependence on fossil fuels. A broad-scope review allows SAIs to identify strengths and weaknesses, determine where audit can provide added value, reach common understanding with national administrations on the overall context before beginning audits, consider internal reorganization to address climate change adequately, and build relationships with relevant experts.

Effective reviews triangulate multiple evidence sources. This can involve combining document review, interviews, and physical site verification to cross-validate findings; using aerial photography and satellite imagery to verify documentary claims and identify unreported issues; conducting time-series analysis of publicly available satellite images to document environmental changes over extended periods; cross-checking government data against external authoritative sources; consulting climate experts and former senior officials to validate findings and identify lessons; and using global benchmarks to establish context and identify peer countries for comparison.

High-value-added reviews combine multiple evidence sources with thorough mapping of budgetary and financial flows across sectors over several years, and also consider past audit work.

Where SAIs have the legal capacity to publish such reviews, doing so represents good practice. Many SAIs have published reviews based on ClimateScanner work. The United Kingdom's National Audit Office (UK NAO) has an established practice of publishing departmental reviews. Its Department for Net Zero and Energy Security overview provides resources for Parliament, civil society, and the public while ensuring the NAO has current understanding of departmental activities.

While some SAIs rely primarily on desk reviews and interviews with government officials at this stage, others have supplemented these approaches in numerous ways to add value while keeping resource use low.

Compliance: For compliance audits that lead to separate reports, SAIs take similar preparatory steps. Where compliance audit leads to audit opinions, SAIs carry out an initial assessment of inherent risk and control risk. Good practice includes using performance audit team members to contribute to the initial control assessment, and vice versa. Key compliance risks to consider include incomplete disclosure of emissions, failure to use grants and subsidies for their specified purposes, and greenwashing. These are all issues that also affect performance.

Examples of effective review outputs

- Mapping of governance architecture showing institutional responsibilities and coordination mechanisms across government levels (Philippines, United Kingdom 3, Fiji, India)
- Assessment of consistency between stated climate commitments and policy implementation trajectories (Spain, Portugal)
- Use of global risk indices to situate national climate vulnerability in an international context (Philippines)
- Multi-decade synthesis of audit findings to identify persistent systemic patterns rather than isolated failures (Canada)
- Combination of document review, interviews, and physical site verification to cross-validate findings (India 2, Philippines, Tanzania 1, Maldives 1)
- Cross-checking government data against external authoritative sources (Tanzania 1)
- Consultation with climate experts and former senior officials to validate findings and identify lessons learned (Canada 4)
- Geographic mapping of climate risk distribution to identify under-protected high-vulnerability areas (Malta, Tanzania 2)
- Multi-year longitudinal analysis of climate impact trends rather than point-in-time snapshots (Tanzania 2, Colombia 2)
- Identification of populations and assets most vulnerable to specific climate impacts (Tanzania 1, India 1, Malta 1)
- Assessment of how multiple climate risks interact and cascade through interconnected systems (Netherlands 2)

The TCU Energy Transition Practical Guide recommends comprehensive initial analysis through an audit canvas, a collaborative diagnostic tool that:

- Maps the ecosystem (key stakeholders: government bodies, ministries, regulatory agencies, the private sector, and civil society)
- Analyses political and regulatory context (legal framework, public policies, and national and international commitments)
- Assesses data availability (documents, reports, and databases) and audit criteria accessibility (laws, targets, and best practices)

This structured approach organizes information logically, identifies knowledge gaps, and highlights critical points for audit focus.

3.2 Focus on outcomes

Performance: The fundamental question is not whether governance structures exist, but whether they deliver measurable results, including actual emissions reductions, genuine reductions in vulnerability, and real protection of ecosystems. For finance ministries and parliaments, this question is ultimately about return on public investment: are budget resources deployed for climate action achieving their intended purpose, or are they supporting activity without impact? SAIs add most value when they ask whether climate action is working. Effective auditing and reporting reduces the risk that national administrations fall into the trap of goal displacement (see annex C), in which the original objectives of climate policies become overshadowed by processes and administrative requirements.

Good practice includes quantifying GHG emissions trends (see annex A.3 for relevant sources) over multi-year periods to establish baseline context, documenting the direction of emissions trends relative to stated reduction commitments, and focusing on actual risk reduction achieved rather than plans produced.

ClimateScanner: The Bundesrechnungshof (SAI Germany) distinguished between advanced levels of organizational implementation and weaknesses in delivery

"We assessed 75 percent of the items under axis 1 as having an advanced level of implementation and 16 percent as having an intermediate level of implementation. For the component "monitoring mechanisms", we rated one item as advanced and another as intermediate.

Nevertheless, we are critical of the mechanism set out in the Federal Climate Change Act which is to make adjustments in the event of projected gaps in the achievement of climate targets.

We cannot understand why adjustments are only made after two consecutive projections show a target gap. The only effect of this arrangement is that the government is wasting time when, in view of the continuing climate protection gap, it should react quickly to still be able to achieve the climate protection targets for 2030."

(Germany 2)

Critics of audit, such as Michael Power,[17] often focus on its tendency to reduce all questions to a template of whether procedures have been followed. Working backwards from weaknesses in outcomes or outputs to deficiencies in process can be productive. If the right outcomes are delivered, the case for perfecting processes becomes less compelling.

Compliance: The framework for compliance audit varies significantly between SAIs. Auditors typically do not treat an error in process as having the same impact as, for example, making payments to a body that did not meet the conditions for reimbursement.

17 Power argued that audit can lead to dysfunctional outcomes for the organizations being audited.

"The 'homes better protected' target is an easy-to-understand performance measure, but on its own does not provide a good view of progress in tackling overall flood risk. It does not provide any indication of what has happened to flood risk for non-residential buildings, agricultural land and other infrastructure. The headline figure of 242,000 homes better protected also does not take account of properties that have become less well protected due to factors such as housing development, climate change and the condition of flood defence assets. EA uses its National Flood Risk Assessment to estimate the number of properties at risk of flooding each year and estimates that there are 50,000 fewer properties with an annual likelihood of flooding of at least 1 percent in 2020 compared with 2016."

(United Kingdom 2)

Identified good practices

- Quantification of expected GHG impact from sectoral policies and comparison with actual achievement (Germany, Sweden)
- Focusing on actual risk reduction achieved rather than plans produced (United Kingdom, Tanzania)
- Opening findings with quantified impact data including deaths, injuries, properties damaged, and economic losses (Tanzania, Colombia)

3.3 Put together an independent analysis that produces new evidence

Performance and compliance: The climate audits that have had the greatest impact share a common feature: the audit team carried out analytical work that generated findings the auditee had not produced, or published, and could not easily dismiss. This is distinct from verifying whether the government followed its own procedures, mapping actions against commitments, or summarizing what officials reported in interviews.

The distinction matters because climate policy is an area in which governments produce extensive documentation, including strategies, plans, targets, and progress reports, that can create an appearance of action without delivering results. An audit that checks whether these documents exist and whether they contain the right elements risks confirming the appearance rather than testing the reality. The most productive audit approach is often to bring an analytical framework from outside the programme's own reporting logic and apply it to the available data.

This takes different forms, depending on the audit topic and the SAI's capacity:

- **Applying recognized standards to test claimed results:** Canada's Commissioner applied GHG accounting principles (ISO 14064-2) to the Emissions Reduction Fund, a programme providing interest-free loans to oil and gas companies to reduce methane emissions. The programme reported expected reductions of 3.1 million tonnes of carbon dioxide (CO_2) equivalent from its first 40 funded projects. By applying standard accounting principles, particularly completeness, including indirect emissions effects, and additionality, meaning whether reductions would have happened anyway, the audit found that for 27 of the 40 projects, programme funding would accommodate increased oil and gas production whose emissions could outweigh the claimed reductions. This finding would not have emerged from checking programme procedures or interviewing officials. It required the auditors to do the calculation themselves.

- **Benchmarking national performance against international comparators:** The same Commissioner included a simple comparison of G7 countries' emissions reductions since 1990 and 2005 in the annual report under the Canadian Net-Zero Emissions Accountability Act. This placed Canada's 7.1 percent reduction since 2005 alongside the United Kingdom's 39 percent reduction over the same period. The Canadian government was not publishing this comparison. A single graph produced a finding, that Canada was the worst performer in the G7, which framed the entire public debate.
- **Quantifying what the government has not quantified:** Brazil's TCU quantified energy subsidies across all sources, finding R$79.88 billion in fossil fuel subsidies against R$22.76 billion for renewables, a ratio of 4:1 ratio, and examined whether the national energy investment programme's 62 percent allocation to fossil fuels aligned with stated climate objectives. The German Federal Audit Office's examination of the Energiewende assessed whether renewable energy deployment, grid infrastructure development, and emissions reductions aligned with policy goals and their costs. This was a comprehensive analytical assessment that tested policy coherence across the entire energy transition rather than examining individual programmes in isolation.
- **Testing whether adaptation investments actually work:** The UK NAO examined recurring flood events at the same locations and assessed whether government flood defences had reduced damage. This required comparing outcomes across events rather than simply verifying that defences had been built. The finding that the government simultaneously constructed flood defences while permitting excessive groundwater extraction that caused land subsidence, progressively undermining those same defences, emerged from joining up evidence across policy areas, not from auditing either policy in isolation. Fiji's SAI found that a new village had been constructed for villagers threatened by rising sea levels, but that beneficiaries had largely returned to their original village.
- **Calculating the cost of inaction or poor management:** Tanzania's SAI found that from January 2023 to July 2024, the country generated only TSh36 billion from carbon credit sales, just 3 percent of the TSh1.26 trillion it could have earned, due to weak coordination, lack of proper guidance, and limited public awareness. The specific quantified loss, and the scale of the failure (97 percent of potential revenue foregone) made this a finding that demanded action. This required the auditors to establish what the revenue should have been, not merely to report what it was.

What these examples have in common is not a particular methodology but an orientation: the auditors asked, "What is actually happening?" rather than, "Did the government do what it said it would do?" and then carried out the analytical work needed to answer their own question. This sometimes requires technical capacity, such as applying GHG accounting standards, but it often requires only the willingness to make a calculation, draw a comparison, or bring together data from different sources that the government keeps separate.

For SAIs building capacity in climate auditing, this orientation can be applied at any level of technical sophistication. Even a straightforward comparison, such as placing national emissions trends alongside the stated target on a single graph, can produce a finding more powerful than pages of procedural analysis. The key is to produce evidence that did not previously exist in the public domain.

3.4 Use global benchmarks and indices to situate national performance in an international context

Performance: Global benchmarks are used well by some SAIs. For many reports on climate change issues, greater use of global benchmarks would be the simplest way to add further value.

An example of good practice in this area comes from the Philippines Commission on Audit. This SAI included in its report on the National Climate Change Action Plan a reference to a global benchmark that helped readers contextualize the risks faced by the country: "The 2021 Global Climate Risk Index (CRI) reveals that the Philippines occupies the 17th position

among nations most significantly impacted by extreme weather events."

The same report used the Philippines' high vulnerability ranking to frame the significance of the governance gaps it identified. In this way, it connected institutional failures to concrete population exposure. Where governance weaknesses might otherwise appear as technical compliance issues, situating them against the country's ranking as the fourth most affected globally over 20 years (2000–2019) gave weight to the findings.

Appropriate use of key global benchmarks offers an effective, low-cost way to add value to an audit report on climate change issues (box 3). One good practice is to use such benchmarks to identify countries with economic, climate, and social characteristics similar to those of the SAI's own country, but that have made stronger progress on mitigation or adaptation, and then examine the reasons for that difference. Canada's reference to the UK Climate Change Committee model illustrates this approach, drawing lessons from the institutional innovation of a comparable country.

Compliance: Compliance auditors are less likely to make extensive use of global benchmarks, but may find them useful as a basis for developing analytical procedures and detecting unusual patterns in spending and results. Databases available from international organizations also form a valuable source of comparison for compliance auditors.

Identified good practices

- Use of global risk indices to situate national climate vulnerability in an international context (Philippines)
- Use of international performance comparisons (Philippines) and national emissions performance (Lithuania) to show where a country stands relative to peers (Canada, Philippines)
- Reference to successful policy combinations from comparable countries (Canada 4 United Kingdom Climate Change Committee model)
- Application of international frameworks to assess domestic compliance (Malta, Fiji, ClimateScanner reviews)

Box 3: Use of global benchmarks by Brazil's Tribunal de Contas

In an audit of the energy transition, TCU Brazil situated national performance, opportunities and risks through the use of multiple international benchmarks. The audit report triangulates across four distinct perspectives: The World Economic Forum's Energy Transition Index positions Brazil 12th globally but identifies regulatory gaps and innovation deficits relative to top performers; the World Bank's RISE index points to specific policy gaps in carbon pricing and transport efficiency; IEA global investment data show that Brazil's capital costs (10 to 12 percent) are significantly higher than advanced economies (4 to 6 percent), despite superior renewable resources, quantifying an issue that undermines competitiveness; and OECD subsidy methodologies adapted by Inesc quantify the distributional impact of Brazil's subsidy structure.

This multi-framework approach allowed the TCU not only to provide context for national measures but also to move towards identifying key obstacles. For example, the report notes that Brazil subsidizes fossil consumption at rates exceeding OECD countries despite having cheaper renewable alternatives.

The World Bank's RISE index gave Brazil's energy transition a score of 82 points in 2021. This placed the country above the global average of 60 points and the Latin American regional average of 61 points, ahead of Costa Rica, with 76 points, but behind Mexico, with 85 points.

3.5 Apply a whole-of-government approach

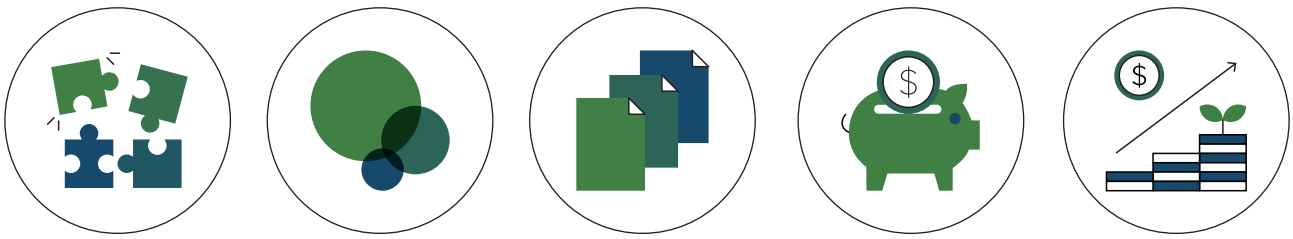
Performance: Climate change is fundamentally a whole-of-government challenge. Specialized ministries typically control only a fraction of climate-relevant spending, while the bulk sits within transport, agriculture, energy, infrastructure, and finance portfolios. Audits that examine only the environment ministry will miss most of what matters. This guide therefore emphasizes approaches that trace climate responsibilities and resources across institutional boundaries. The progressive frameworks in chapters 5 and 6 demonstrate how this whole-of-government perspective can be applied in practice when auditing mitigation and adaptation.

Presenting clear, evidence-based audit reports to Parliament is a central role of SAIs, enabling legislators to hold governments accountable and guide the effective use of climate investments. Engaging other stakeholders, including finance, environment, and planning ministries, as well as national and international actors, further strengthens coordination and supports better decision-making, helping to ensure that public resources achieve their intended climate outcomes.

Good practices include analysing the distribution of climate expenditure across ministries to identify gaps between formal responsibility and actual spending power (figure 4). They also include undertaking cross-departmental systemic analysis to reveal fragmented accountability where no single entity controls sufficient levers for success, assessing whether coordination mechanisms function in practice, examining the alignment between national climate strategies and local government implementation capacity and resources, and evaluating multi-jurisdictional coordination challenges and their impact on policy effectiveness.

Compliance: Organizational complexity is a key inherent risk and has implications for control risk. Compliance auditors will map transaction flows and accountability arrangements within government. They may consider whether funds are used for climate purposes both by implementing agencies and by beneficiaries. Where subnational entities have significant climate responsibilities, compliance auditors will also examine whether the central government monitors subnational compliance and whether enforcement mechanisms exist and function.

Figure 4: Identifying fragmentation, overlap, and duplication



Fragmentation refers to those circumstances in which more than one federal agency (or more than one organization within an agency) is involved in the same broad area of national need.

Overlap occurs when multiple agencies or programs have similar goals, engage in similar activities or strategies to achieve them, or target similar beneficiaries.

Duplication occurs when two or more agencies or programs are engaged in the same activities or provide the same services to the same beneficiaries.

Cost Savings refers to financial benefits from actions to reduce federal costs or better target federal resources.

Revenue Enhancement refers to financial benefits from actions to collect federal revenue.

Source: United States Government Accountability Office (2025). ***2025 Annual Report****: Opportunities to Reduce Fragmentation, Overlap, and Duplication and Achieve an Additional One Hundred Billion Dollars or More in Future Financial Benefits.* https://files.gao.gov/reports/GAO-25-107604/index.html

Identified good practices

- Analysis of the distribution of climate expenditure across ministries to identify gaps between formal responsibility and actual spending power (United Kingdom 5, Netherlands 1)
- Assessing whether coordination mechanisms function effectively rather than merely existing nominally (Norway 2, Tanzania 1, Netherlands 2, United Kingdom 3)
- Examination of the alignment between national climate strategies and local government implementation capacity and resources (United Kingdom 5 and 6, Lithuania)
- Evaluation of multi-jurisdictional coordination challenges and their impact on policy effectiveness (Norway 2, Canada 7, United Kingdom 3)

3.6 Quantify findings wherever possible and ensure monitoring frameworks enable meaningful measurement

Performance: Successful climate auditing involves moving beyond qualitative assessment to quantification wherever evidence permits. SAIs add value when they quantify results, whether in tonnes of emissions reduced, populations protected, or money spent.

GHG emissions remain the primary measure of mitigation success. Beginning audit reports with the overall emissions context represents good practice, whether the audit examines overall emissions or specific sectors. Good practice includes quantifying emissions trends over multi-year periods to establish baseline context, documenting trend direction relative to stated reduction commitments, positioning national performance in an international context, such as Canada's 8.5 percent reduction since 2005 against its 40 to 45 percent target by 2030, and undertaking sector-specific deep dives that quantify progress towards targets.

Beyond GHG emissions, key metrics available to SAIs include carbon intensity, meaning emissions per unit of gross domestic product (GDP), as a measure of transition progress; the share of renewable energy in total supply, which enables international benchmarking; fossil fuel subsidy levels, which are both a cost multiplier and barrier to transition; and, for adaptation, the population and asset value in high-risk zones, implementation rates of adaptation plans, and, in very good practice, actual loss reduction when extreme weather events recur.

Compliance: Auditors will typically use approaches that enable them to quantify the extent of any issues or irregularities they identify.

> The Canadian audit office's examination under the Canadian Net-Zero Emissions Accountability Act assessed 20 mitigation measures against 7 standardized criteria, providing quantified evidence: 9 of 20 measures were on track, 9 faced challenges, and 2 confronted significant barriers.
>
> (Canada 3)
>
> Lithuania's State Audit Office demonstrates sector-specific quantification through its transport sector examination. The audit documented that renewable energy in transport reached only 6.7 percent in 2022 against a 10 percent target for 2020, a clear and measurable shortfall.
>
> (Lithuania)

Box 4 provides an example from the Philippines of how misalignment can be identified and reported.

Identified good practices

- Quantification of GHG emissions trends over multi-year periods to establish baseline context (United Kingdom 3, European Court of Auditors (ECA) 3)
- Documentation of emissions trend direction relative to stated reduction commitments (Lithuania)
- Tracking renewable energy deployment progress against targets, with analysis of the causes of shortfalls (Lithuania)

Box 4: Philippines Commission on Audit: National Report on the Climate Change Action Plan

As the overarching strategy for climate change adaptation and mitigation, the National Report on the Climate Change Action Plan (NCCAP) is intended to be integrated across all levels of governance is desired. However, the evaluation of key stakeholders' climate change initiatives reveals misalignment between the NCCAP and the development plans of national agencies and local government units. At the national level, climate change programmes of the six lead government agencies responsible for human security and knowledge and capacity development lack clear connections to the goals of the NCCAP. The delineation of roles, responsibilities, and accountabilities among these lead agencies is also unclear, resulting in misalignment between their priorities and those of the NCCAP, ranging from 0 percent to 75 percent during 2017–2022.

- Assessment of multiple mitigation measures against standardized criteria covering timeliness, reliability of estimates, value for money, and equity (Finland, Denmark 1, Norway 2, Canada 3)
- Quantification of implementation gaps against planned adaptation activities (Philippines, Tanzania)
- Quantification of value at risk from climate hazards (Malta)
- Converting qualitative observations into quantitative metrics for clarity (multiple audits)
- Establishing significance through trend visualization before detailing systemic causes (Tanzania)

3.7 Use satellite and aerial imagery to verify performance and compliance with spatial requirements, where this produces good results

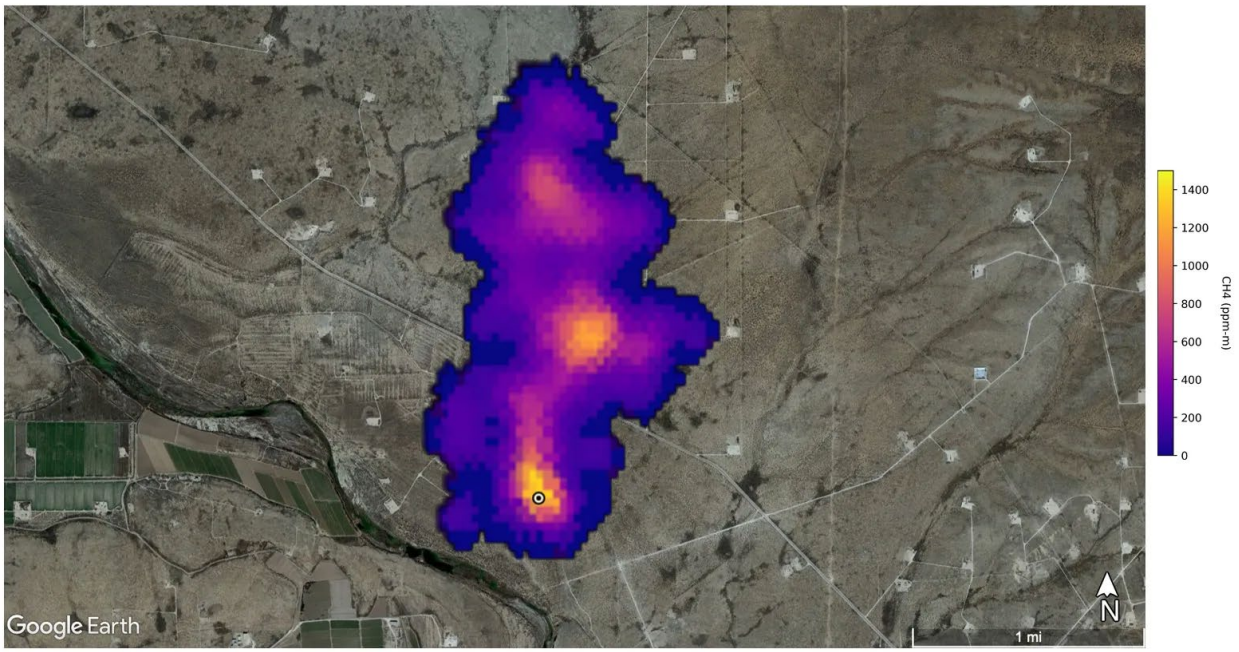
Performance: Good practices identified include use of multi-year longitudinal design to identify trends, geographic or risk-based sampling using objective criteria, external benchmarking against international standards, triangulation of evidence sources by combining documents, interviews, and physical verification, future-proofing assessment (evaluating whether defences are designed for projected future climate conditions), and value-at-risk analysis to quantify exposure and prioritize investment.

Numerous SAIs have used satellite and aerial photos to detect and quantify issues such as desertification or deforestation (Colombia 1, Tanzania 2) Sources of aerial or satellite photos are usually available at little or no cost (see annex A).

A more sophisticated use of satellite imagery involves detecting gas emissions that may be invisible to the human eye. Satellite imagery is commonly used to identify sources of methane emissions, including intensive animal production, abandoned mines and oil wells, legal or illegal landfills, and factories. Addressing sources of methane emissions represents a valuable step in mitigation because methane is a potent GHG. SAIs may use satellite analysis directly, as open-source images are available, or consider whether national administrations are making good use of satellite images. Figure 5 illustrates how methane emitters can be identified using NASA data.

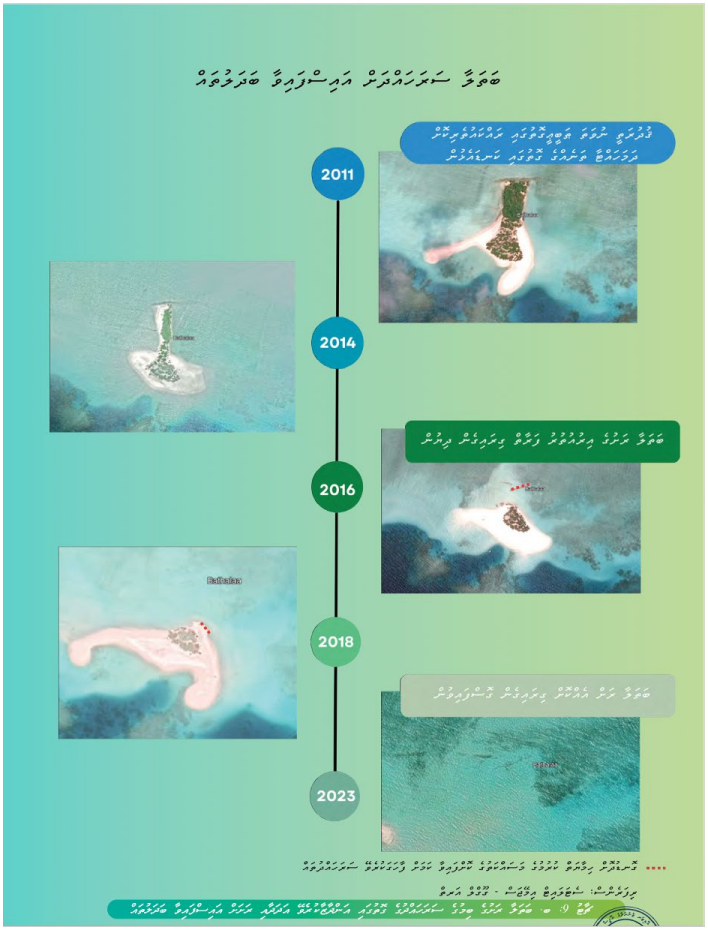
Box 5 provides a related example from India of how geospatial analysis can be used to verify environmental conditionality.

Figure 5: Methane emitters mapped by NASA



Credits: NASA/JPL-Caltech

A recent report from SAI Maldives shows a dramatic and low-cost application of aerial images. Using a time series of publicly available Google Earth images, in a report combining elements of compliance audit, SAI Maldives showed that inappropriate action on an island leased to house a holiday resort led eventually to the island's disappearance.



Box 5: Verification of environmental conditionality

SAI India's performance audit of coastal ecosystem conservation, while not framed explicitly as a climate audit, demonstrates compliance methodologies that are directly applicable in climate adaptation contexts. Coastal zone regulations exist in part to protect against erosion and storm surge, risks that intensify with climate change. The audit compared approved Coastal Zone Management Plans with satellite imagery to identify violations that documentary review alone would not have revealed, including construction in no-development zones and on turtle-nesting sites. Time-series analysis of historical imagery established when violations occurred, addressing the common evidentiary challenge of incomplete or contested documentary records. Joint physical verification combined desk-based geospatial analysis with site visits involving audit teams and relevant officials, a triangulated approach that strengthened the evidence while creating opportunities for engagement with the auditee.

Compliance audit: Auditors in other SAIs have applied similar aerial and satellite imagery techniques to verify compliance with agricultural conditionality requirements, such as obligations to leave fields fallow, maintain vegetation cover, or avoid overgrazing, where ground-level inspection would be prohibitively resource intensive.

As satellite images are taken every few days, it is possible to identify with relative precision when, for example, tree felling took place or land was ploughed. This can provide invaluable evidence for compliance auditors.

Identified good practices

- Use of aerial photography and satellite imagery to verify documentary claims and identify unreported issues (Tanzania 2, Colombia 1, Malta 1, United Kingdom 5, India 2, Maldives 1)
- Time-series analysis of publicly available satellite images to document environmental changes over extended periods (Maldives 1, Colombia 2)
- Use of aerial photography to document ecosystem degradation and the effectiveness of conservation measures (India 2, Maldives 1)
- Use of publicly available satellite imagery rather than commissioning custom surveys (Maldives)

Analysis and assessment

Examining whether climate action addresses the right problems in the right ways

Beyond verifying that climate-related activities are taking place, auditors assess whether they address climate risks, align coherently across sectors, prioritize vulnerable populations, and anticipate rather than merely react to climate impacts. These practices guide auditors in examining the quality and appropriateness of climate action.

3.8 Assess policy coherence: Examine whether government policies across sectors work together or undermine each other

Performance: Climate policy coherence requires actions across sectors to align with stated climate commitments rather than contradict them. The most significant barrier to climate progress is often not insufficient climate policy, but the persistence of policies that actively undermine climate objectives. From a public finance perspective, this incoherence represents more than contradictory objectives. It constitutes wasteful use of public resources. Box 6 shows how TCU Brazil applied comprehensive coherence assessment in practice. Chapter 5 (Stage 4 of the mitigation framework) addresses policy coherence assessment in detail for mitigation audits.

Fossil fuel subsidies represent a clear, and frequently underestimated, example of policy incoherence. Governments cannot credibly pursue decarbonization while simultaneously subsidizing the consumption or production of coal, oil, and gas. IEA estimates global fossil fuel subsidies at more than $1 trillion annually, far exceeding spending on renewable energy support. Yet many of these subsidies are implicit, including tax expenditures, preferential rates, and below-cost pricing, and do not appear in budget documents as

Box 6: TCU Brazil's energy transition audit exemplifies comprehensive coherence assessment

Beyond documenting Brazil's subsidization of fossil fuel consumption at rates that were higher than in most OECD countries, the TCU's audit examined regulatory frameworks using the World Bank's RISE index to identify specific gaps in carbon pricing and transport efficiency policy. The audit quantified how Brazil's energy subsidies disproportionately benefit wealthier households while creating fiscal costs that could otherwise fund renewable deployment. By triangulating subsidy data, investment patterns, and regulatory gaps, the audit demonstrated systematic incoherence: policies ostensibly supporting transition were undermined by contradictory measures elsewhere in government.

line items, making them invisible to traditional fiscal oversight unless auditors examine them explicitly.

Good practice includes quantifying fossil fuel subsidies using OECD or IEA methodologies and comparing them with renewable energy support, and examining whether policies across transport, agriculture, taxation, trade, and infrastructure align with or contradict climate commitments. SAIs trace how decisions made in finance ministries (tax policy, subsidy allocation, and investment pipelines), infrastructure ministries (transport planning and building standards), trade ministries (trade agreements and export credit agencies), and agriculture ministries (land-use incentives and fertilizer subsidies) either support or contradict the climate commitments typically housed in specialized ministries.

The framework summarized in table 2, developed from audit experience across multiple SAIs, provides a systematic approach to identifying maladaptive subsidies in energy and water, two sectors in which policy incoherence is most pronounced and fiscally significant.

Compliance: Policy incoherence can lead to compliance issues when contradictory policies create situations in which following one set of rules means violating another. Compliance auditors examining climate finance flows assess whether funding genuinely supports transition or relabels business-as-usual activities as "climate action". Where governments are required to report on policy coherence, compliance auditors can examine whether these reports accurately reflect the situation on the ground, including contradictory policies.

Identified good practices

Quantification and comparison of fossil fuel subsidies versus renewable energy support (ECA 5, Brazil 1, Estonia)

- Documentation of specific instances where programmes ostensibly supporting climate goals actually subsidized emission-increasing activities (Canadian Emissions Reduction Fund, 2021)
- Examination of whether agricultural and water policies support or undermine environmental objectives (Spain 1, Portugal 1, ECA 1, Colombia 2, Cyprus 2)
- Assessment of whether sectoral policies align with whole-of-government climate targets (Lithuania, Canada 2, Norway 2)
- When planning audits of climate policies that operate alongside other interventions, mapping the full suite of related policies and assess interaction effects (United Kingdom 9)

Estonia's environmental fees audit revealed a common form of policy incoherence: pollution fees set so low they failed to change behaviour, functioning as licences to pollute rather than incentives for improvement. The audit found systematic under-pricing across multiple pollutants, with companies simply paying nominal fees rather than investing in emissions reduction. This represents coherence failure at the design level, where the fee structure contradicted the stated policy objective of pollution reduction. The audit's independent verification of company self-reported data (finding significant underreporting) revealed that weak enforcement compounded weak design.

Table 2: Identifying maladaptive subsidies in energy and water

Common feature	Energy sector example: Fossil fuel subsidies	Water sector example: Groundwater subsidies	Key audit questions
Finite resource over-exploitation	Depleting carbon budget for 1.5°C/2°C temperature targets	Depleting aquifer recharge capacity beyond sustainable yield	Does extraction or consumption exceed sustainable rates? What is the trajectory?
Below-cost pricing	Fuel sold below production cost or market price	Water charges recovering <50% of supply, treatment, and resource costs	What is the cost recovery rate? Who benefits from the subsidy?
Overconsumption incentive	Artificially cheap energy discourages efficiency and renewables adoption	Artificially cheap water discourages conservation and efficient irrigation	How does pricing influence consumption behaviour? Are demand-side measures implemented?
Infrastructure lock-in	Investments in fossil fuel extraction and distribution assume continued use	Investments in boreholes and irrigation systems assume continued over-extraction	What is the useful life of subsidized infrastructure? Is it consistent with climate goals?
Concentrated benefits, diffuse costs	Industry profits and specific regional employment versus global climate damage	Agricultural sector profits and rural political support versus future water scarcity	Who benefits financially? Who bears the long-term costs? Is this distribution equitable?
Political reform barriers	Powerful lobbies, regional dependencies, “energy security” framing	Organized agricultural interests, rural constituencies, “food security” framing	What political economy factors constrain reform? Are transition support mechanisms in place?
Hidden fiscal costs	Tax expenditures, preferential rates often not counted as subsidies	Foregone revenue from incomplete cost recovery rarely budgeted explicitly	Are implicit subsidies quantified and reported in budget documents?
International policy conflicts	Trade agreements versus Paris Agreement commitments	Agricultural support programmes versus water sustainability mandates	Do multiple international obligations create conflicting incentives?
Example case	Many countries subsidize fossil fuels while pursuing net-zero targets	Cyprus recovers only 27.6% of irrigation water costs while aquifers are over-extracted in 14 of 22 groundwater bodies (Cyprus 2)	Does the government recognize the subsidy as undermining climate goals?

3.9 Assess whether climate action prioritizes those most vulnerable

Performance: Climate impacts fall disproportionately on those least able to adapt, including low-income communities, Indigenous Peoples, rural populations, coastal settlements, and regions with limited infrastructure. Similarly, mitigation policies can impose costs unequally or deliver benefits primarily to wealthier households. SAIs can assess whether both adaptation investments and mitigation policies advance equity or inadvertently reinforce existing inequalities.

For adaptation, SAIs can examine whether investments align with vulnerability assessments rather than being driven by political convenience or ease of implementation. Good practice includes examining whether:

- Adaptation funding reaches the populations and regions identified as most vulnerable in risk assessments
- Resource allocation reflects the distribution of climate risk rather than administrative or political priorities
- Vulnerable communities participate meaningfully in identifying their adaptation needs and priorities
- Implementation mechanisms account for the limited capacity of vulnerable populations to access and benefit from adaptation programmes

For mitigation, SAIs can assess the distributional impact of climate policies, including who bears the costs and who receives the benefits. Good practice includes examining whether:

- Fossil fuel subsidies disproportionately benefit wealthier households while creating fiscal costs that could otherwise fund programmes reaching vulnerable populations
- Carbon pricing mechanisms include compensatory measures for low-income households facing higher energy costs
- Incentives for clean technology, such as electric vehicles, rooftop solar, energy-efficient appliances, are accessible to lower-income households or primarily benefit wealthier ones
- Just transition measures to support workers and communities that are economically dependent on fossil fuel industries avoid subsidizing the industries concerned
- Rural and remote communities have equitable access to clean energy infrastructure and programmes

Examples: Equity assessment in adaptation and mitigation

Tanzania's flood management audit examined whether adaptation investments targeted the most vulnerable populations and high-risk areas. The audit found significant misalignment: some lower-risk areas received flood defences, while highly vulnerable regions remained unprotected. Resource allocation followed administrative convenience rather than risk-based prioritization, leaving the most exposed populations without adequate protection.

Pacific SAI audits on adaptation sequencing consistently found that adaptation actions often failed to prioritize the most vulnerable. In several countries, adaptation resources were spread thinly across multiple initiatives rather than concentrated on protecting those facing the greatest risks. The audits recommended that governments use vulnerability assessments rigorously to sequence adaptation investments, ensuring that limited resources protect those most in need first.

The **Philippines Commission on Audit** found that local government units struggled to identify and prioritize vulnerable producers in climate adaptation programmes. The mechanisms implemented were insufficient to distinguish those most at risk, which undermined both the effectiveness and equity of adaptation efforts. Without systematic approaches to identifying vulnerability, adaptation resources may reinforce existing inequalities rather than reducing them.

TCU Brazil's energy transition audit found that Brazil subsidizes fossil fuel consumption at rates exceeding OECD countries despite having superior renewable resources, and that this subsidy structure has regressive distributional impacts, where higher-income households capture most of the benefit while the fiscal cost is borne by all taxpayers.

Where vulnerable populations are not prioritized in adaptation, this represents both an effectiveness failure (resources not deployed where they would have greatest impact) and an equity failure (those least responsible for climate change bearing its heaviest costs). Where mitigation policies deliver benefits primarily to wealthier households while imposing costs on vulnerable populations, this creates both political obstacles to climate action and fundamental injustices. Climate policies can inadvertently increase inequality, protecting or benefiting those with political voice or economic resources while leaving the most exposed to face intensifying risks or bear disproportionate costs.

Compliance: Where legislation or regulations establish requirements for targeting vulnerable populations, prioritizing high-risk areas, or ensuring equitable distribution of benefits, compliance auditors can verify whether these requirements are met in practice. Where subsidy or incentive schemes are established to support climate action, compliance auditors can assess whether eligibility criteria and implementation mechanisms enable or prevent access by intended beneficiaries.

Identified good practices

- Assessment of whether adaptation investments align with stated risk priorities from risk assessments (Pacific SAIs)
- Examination of whether most vulnerable populations and locations receive priority for adaptation resources (Tanzania 1, Pacific SAIs)
- Analysis of whether adaptation sequencing follows a strategic logic based on urgency and cost-effectiveness (Pacific SAIs)
- Assessment of benefit-sharing arrangements for equity and transparency (Tanzania)
- Identification of populations and assets most vulnerable to specific climate impacts (Tanzania 1, India 2, Malta 1)
- Use of objective risk-based criteria for geographic site selection (Philippines, Tanzania 1)
- Inclusion of both high-capacity and resource-constrained jurisdictions to distinguish systemic failures from localized ones (Tanzania 1)

3.10 Assess whether adaptation strategies anticipate rather than react

Performance: SAIs have shown that government adaptation action is often reactive, responding to climate events already occurred, rather than anticipatory. Flood defences are frequently strengthened after catastrophic flooding, drought response plans are developed after severe water shortages, and coastal protection is upgraded after storm damage, meaning that such spending is difficult to classify as adaptation to future climate change. Audits in Malta, Tanzania, and the United Kingdom have documented this pattern in different contexts.

This reactive approach costs more, because repairing damage typically exceeds prevention costs, leaves populations unnecessarily vulnerable during the lag between events and response, and creates a risk that infrastructure is designed for the last crisis rather than the next, thereby creating hidden fiscal liabilities.

Climate change creates genuine challenges for adaptation planning. Historical patterns, such as “100-year floods”, lose meaning when the climate that produced those statistics is changing. Climate models show clear directional trends (more intense precipitation, higher sea levels, and more frequent heatwaves) but cannot predict precise timing or magnitude at local scales.

This uncertainty does not justify planning only for conditions already experienced. SAIs can assess whether governments make reasonable provisions for foreseeable future risks. Good practice includes examining whether:

- Adaptation strategies explicitly acknowledge that historical patterns may not hold, rather than simply applying historical design standards
- Decision makers have examined credible climate projections and documented how these informed design choices, for example, whether flood defences are designed using only historical flood frequency or whether they incorporate projections of increased extreme precipitation
- Infrastructure includes safety margins beyond historical experience, reflecting directional trends in climate science

- Plans are adaptive and can be upgraded as knowledge improves, such as flood defences that can be raised or water systems designed for additional capacity
- The government has considered asymmetric costs, since infrastructure that proves unnecessary represents wasted resources, whereas infrastructure that proves inadequate may result in deaths and catastrophic damage
- Climate risk and adaptation investments are reflected in fiscal planning

Compliance: Where adaptation planning is required by law or regulation, compliance auditors can verify whether plans meet prescribed standards and whether those standards require consideration of future climate projections. Compliance auditors may also need to consider legal or regulatory requirements that mandate anticipatory approaches, for example, requirements that infrastructure projects consider climate projections or that adaptation plans be reviewed and updated periodically.

Identified good practices

- Assessing whether flood defences and infrastructure are designed for projected future climate scenarios rather than historical patterns (United Kingdom 2)
- Evaluation of whether infrastructure investments incorporate climate risk assessment in design and location decisions (Malta 1, United Kingdom 2)

The UK NAO's examination of flood risk management found that while strategies referenced climate change, investment prioritization still relied heavily on historical flood data. The audit documented specific cases where recent flooding exceeded design standards based on historical patterns. Recent SAI reports from Tanzania (2024), Malta (2023), and the United Kingdom (2023) found consistent patterns: Tanzania quantified how disaster response costs exceeded what preventive infrastructure would have required; Malta documented properties repeatedly flooded that known interventions would have protected; and the United Kingdom showed investment anchored to historical rather than projected risk.

- Use of climate science projections to assess whether current measures are designed for future rather than historical climate conditions (United Kingdom 2, Austria)
- Comparison of prevention costs versus response and recovery expenditure to assess investment priorities (Tanzania 1)

Compliance audit approaches

Applying compliance principles to climate governance and finance

Climate programmes involve elevated compliance risks due to estimation, delegation, and behavioural incentives. These practices highlight risk considerations specific to climate schemes while recognizing the detailed compliance audit methodology addressed in chapter 7. Compliance auditors need to understand both the inherent risks in climate instruments and how to design proportionate assurance responses.

3.11 Consider inherent and control risks when planning compliance work, recognizing that schemes aiming to change behaviour have higher inherent risk than conventional procurement

Compliance: In planning and performing a compliance audit, the audit team considers inherent risk (related to the type of transaction) and control risk (relating to organizational arrangements). Schemes with complicated rules and numerous beneficiaries tend to have high inherent risk. Many climate change related programmes fall into this category. Chapter 7 provides detailed frameworks for climate compliance auditing.

As climate finance shifts from activity-based to outcome-based payments, such as carbon credits, biodiversity net gain, and ecosystem service payments, the challenge of verifying recipient delivery becomes increasingly central to compliance audit work (box 7). Where payments compensate beneficiaries for actions that may run against their perceived short-term interest, inherent compliance risks are higher than in conventional procurement.

Box 7: Climate finance mechanisms and compliance audit challenges

Climate finance flows through diverse channels, each presenting distinct regularity and propriety considerations for SAIs. Traditional public finance mechanisms include direct national budget allocations; grants and project-based funding from international organizations and bilateral donors; green bonds mobilizing private capital through debt securities earmarked for climate projects; and earmarked proceeds from the sale of carbon credits.

Many climate schemes aim to change behaviour rather than procure goods or services. Where payments compensate beneficiaries for actions that may run against their perceived short-term interest—reducing input use, maintaining rather than clearing land, foregoing profitable activities—inherent compliance risks are higher than for conventional procurement. Verifying behavioural change is also more difficult than verifying physical delivery. Market-based mechanisms are among the most effective policy instruments but require good design and strong monitoring systems. Carbon taxes can be straightforward, using the same systems as existing taxes on fuel. Emission trading schemes establish markets where permits to emit become tradeable commodities, demanding sophisticated regulatory oversight.

Compliance auditing of climate finance assesses adherence to the formal criteria governing each financing mechanism. For budgetary funds, this means verifying that expenditure aligns with legislative authorizations, and given the challenges of influencing behaviour, these are frequently complex. International climate finance can introduce additional regulatory layers.

The conduct of officials administering climate finance warrants scrutiny, given the opportunities for rent-seeking. The Australian National Audit Office identified environmental programmes where grant recipients also provided evaluation services. The UK NAO's investigation of energy efficiency schemes found that complex systems involving multiple actors created opportunities for gaming and fraud.

Good practice includes staffing teams from both performance and compliance specialisms when assessing control risk in climate programmes.

Chapter 7 examines compliance audit approaches across the climate delivery chain, from system design through to enforcement, and provides detailed guidance on verification systems, propriety considerations, and good practice drawn from SAI audits.

Identified good practices

- Verification that organizational structures conform to their legislation (multiple examples)
- Assessment of alignment between domestic regulations and international agreement obligations (Fiji, Tanzania)
- Checking that measurements, fees, and charges follow prescribed methodologies (Estonia)
- Examination of whether institutional arrangements operate in accordance with their governing rules (IDI adaptation audits, ClimateScanner reviews)
- For market-based climate instruments, assessment of whether the economic signal (price/incentive) is adequate to drive the behavioural change the policy intends (United Kingdom)
- Verification of pricing transparency and supporting documentation in environmental markets (Tanzania)
- Verification that competent legal authority reviewed contractual agreements for major projects (Tanzania)
- Examination of capacity assessments before project authorization (Tanzania)

3.12 Distinguish between agency error and recipient non-compliance to identify where problems occur

Compliance: When SAIs qualify their audit opinion on annual accounts due to climate-related irregularities, this brings parliamentary and media attention that standalone compliance audits may not achieve. The UK NAO's qualification of the Rural Payments Agency accounts, due to a £40.3 million irregularity (2.87 percent of grant expenditure) in agri-environmental schemes, demonstrates how annual accounts audits can highlight compliance failures in climate-relevant programmes. Such qualifications can distinguish between agency error, where the administering body misapplies the rules, and recipient non-compliance, where beneficiaries do not deliver the agreed environmental outputs, and can therefore identify where in the delivery chain problems occur.

Identified good practices

- Independent verification of self-reported data from regulated entities (Estonia)
- Assessment of whether claimed activities genuinely meet regulatory definitions rather than exploiting loopholes (Philippines, Estonia)
- Cross-checking of reported emissions or resource use against physical evidence (Estonia)
- Analysis of whether discretionary decisions served the public environmental interest or facilitated avoidance (India 2, Estonia, Tanzania 2)

From the audit opinion

Basis for qualified opinion on regularity

"The Rural Payments Agency incurs grant expenditure on a number of schemes aimed to support farmers and other land managers, and to achieve environmental outcomes. The rules for these schemes are set out by the Secretary of State within a framework of statutory regulations. During 2024-25, the Rural Payments Agency measured a level of non-compliance with scheme rules in respect of the Countryside Stewardship and Sustainable Farming Incentive schemes resulting in estimated irregular expenditure of £40.3m. I assess this level of irregular expenditure to be material".

(United Kingdom 6)

From the explanatory audit report

"I have not detected evidence of material irregularity as a result of the agency itself mis-applying scheme rules when it makes payments. The irregularities reflected in this qualification relate to non-compliance by grant recipients, typically where outputs agreed with the agency have been paid for, but observation suggests they have not been fully delivered."

(United Kingdom 6)

3.13 Play a constructive role by helping administrators design schemes with lower inherent risk and more effective control systems

Compliance: The absence of structured fraud and error risk assessment at the scheme design stage is itself a matter of concern that SAIs may legitimately raise. Many climate and environmental schemes are structurally vulnerable to non-compliance because they rely on self-reporting, involve novel or uncertain measurement techniques, and create significant financial or reputational incentives.

Where administrators have not established baseline estimates of fraud and error, they are not in a position to assess whether control systems are proportionate, effective, or consistent with general public financial management requirements. Compliance audits have therefore identified good practices, where SAIs recommend that scheme administrators develop such baselines, enabling more targeted control design and more credible evaluation of compliance risks over time.

In this context, SAIs can play a constructive role by drawing on experience across comparable schemes and jurisdictions to highlight simpler, more robust control arrangements that reduce inherent risk and reliance on discretionary judgement, without unnecessarily increasing the administrative burden.

Audit teams can reinforce this constructive role through a professional tone and clarity of intent. Recognizing the complexity of climate governance, acknowledging measures that have worked well, and making disciplined use of international benchmarking help frame audit findings as contributions to system learning and legal compliance, rather than as retrospective fault-finding.

Practical examples of how design choices affect auditability, including the use of objective evidence such as satellite imagery, are discussed in chapter 7.

Identified good practices

- Distinction between recommendations for national policy, regional coordination, and local implementation, specification of concrete action with responsible entities, and sequencing of recommendations to identify foundational actions before dependent ones (Tanzania)
- Drawing on lessons learned from other SAIs' climate auditing experience (Brazil, Czechia, Slovakia, Spain, Portugal)

3.14 Ensure audit teams understand climate science fundamentals and build capacity progressively from foundational assessments towards more demanding policy coherence analysis

Performance: SAIs can build their climate audit capacity progressively. Not every SAI will immediately conduct sophisticated policy effectiveness evaluations, nor do they need to attempt to do so.

Audit teams should begin with a solid understanding of climate science fundamentals and the architecture of climate finance. This means familiarizing themselves with key conclusions from Intergovernmental Panel on Climate Change (IPCC) assessment reports, understanding the structure of international climate agreements including NDCs and NAPs, and grasping how climate finance flows through different channels, from international funds to domestic budgets to ultimate beneficiaries.

Auditors can develop this understanding progressively through their audit work. Good practice includes building consultation with scientific experts into the audit methodology and strengthening understanding of the fiscal dimensions of climate action. For example, SAIs can draw on national meteorological services, climate researchers, and international organizations with climate expertise. These consultations serve a dual purpose: they strengthen the technical foundations of individual audits while building institutional knowledge within the SAI.

Many SAIs have found value in starting with participation in collaborative exercises. The ClimateScanner rapid review methodology and the IDI/INTOSAI WGEA CCAA (see section 2.1) provide structured approaches that allow SAIs to conduct initial assessments while learning from peer institutions. These exercises offer standardized frameworks that reduce the challenge of designing methodology from scratch.

The SAIs that have produced audits with the widest scope or deepest analysis have typically performed many audits covering different aspects of the climate change challenge and succeeded in managing knowledge across audit teams. Mechanisms for knowledge management through cross-team learning, institutional memory, and synthesis of past findings all contribute to progressive capacity building.. Climate change issues are significant in the context of many sectoral audits of sectors. Good practice is to include climate change considerations into audits of, for example, coastal management (India, Maldives, Sri Lanka), desertification (Spain, Portugal, Tanzania), flood management (Ireland, Malta, United Kingdom), and energy transition (Costa Rica, Indonesia).

The progressive frameworks in chapters 5 and 6 provide guidance on moving towards more comprehensive and analytical climate audits.

Identified good practices

- Use of climate science projections to assess whether current measures are designed for future rather than historical climate (United Kingdom 2, Austria)
- Consultations with climate experts and former senior officials to validate findings and identify lessons learned (Canada 4)
- Participation in international cooperative audits with shared methodology and peer learning (IDI/INTOSAI adaptation audits, ClimateScanner)
- Regional SAI collaboration on common challenges with shared capacity constraints (Pacific SAIs)
- Cross-border audits by SAIs with shared climate challenges enabling bilateral analysis (Portugal, Spain)
- Leveraging existing international data and frameworks rather than generating analysis from scratch, including OECD data, IPCC projections, and ND-GAIN indices

"The Commissioner of the Environment and Sustainable Development and the Auditor General of Canada have been reporting to Parliament on Canada's climate change performance since 1998 (see Appendix). Major international commitments to fight climate change, of which Canada has been a part, date back to 1992. In undertaking this look at 3 decades of Canadian action and inaction on climate change, we reviewed our previous audit recommendations and interviewed senior climate experts, former government officials, and former commissioners."

(Canada 4)

Communication and impact

Ensuring audit findings drive action and accountability

The most rigorous audit work can only achieve limited impact if findings are poorly communicated or recommendations are ignored. These practices address how SAIs present findings to maximize credibility and influence, from the tone of reports to the specificity of recommendations and systematic follow-up that creates cumulative accountability.

3.15 Follow up on previous recommendations to create cumulative accountability and document patterns of repeated non-implementation where they occur

Performance and compliance: Good recommendations will not always be taken up quickly. The Australian National Audit Office (ANAO) found that one environmental agency had been told to implement a risk-based compliance framework in 2008, 2010, 2012, 2015, 2016, 2017, and 2020 and still had not done so. This pattern of repeated non-implementation, despite successive audit recommendations, demonstrates systemic governance failure rather than isolated oversight.

Where recommendations remain unaddressed, SAIs can assess the consequences of non-implementation for climate outcomes and public finances, quantifying, where evidence permits, the emissions increases, adaptation costs, fiscal liabilities, or foregone opportunities that accumulated during the period of inaction. Such quantification translates administrative failure into fiscal terms that finance ministries and parliaments cannot ignore. It answers the question: What did this cost the public?

Identified good practices

- Longitudinal tracking of policy commitment cycles showing whether successive governments improve or repeat past failures (Canada 4)
- Follow-up on previous recommendations to create cumulative accountability (multiple examples)
- Synthesis of past audit work to build institutional knowledge and identify patterns (Canada 4, Brazil 1)

Strengthening climate audits: Some risks to avoid

The following observations reflect recurring challenges encountered in climate-related compliance and performance audits. They draw both on our audit work and on comparative analysis of SAI reports across regions. The issues described are not failures of professionalism but structural risks that can arise when established audit approaches are applied to complex, rapidly evolving policy areas such as climate change. Making these risks explicit is intended to support audit teams in strengthening practice in line with International Standards of Supreme Audit Institutions (ISSAI) principles and in increasing the likelihood that audit work leads to measurable improvements in outcomes.

1. **Confusing outputs with outcomes:** Measuring activities completed, funds disbursed, or plans produced provides limited insight into whether emissions have been reduced or vulnerability has decreased. Audit conclusions need, where possible, to distinguish delivery from impact. (ISSAI 100, focus on results; ISSAI 3000)
2. **Relying excessively on interviews without corroboration:** Statements such as “staff told us” are not audit evidence in themselves and require verification through documentary, analytical, or physical evidence. (ISSAI 100, sufficient and appropriate evidence)
3. **Cherry-picking data or selectively citing sources:** Selective use of evidence undermines perceptions of integrity and weakens the authority of audit conclusions, particularly in contested policy areas. (ISSAI 100, objectivity and balance)
4. **Formulating recommendations so generically that they offer no practical guidance:** Recommendations such as “improve coordination” or “strengthen processes” may pass formal review but often fail to clarify what the auditee ought to do differently. (ISSAI 3000, usefulness of recommendations)
5. **Assuming that the existence of plans, strategies, or coordination bodies implies effective implementation:** Audit work needs to test whether these mechanisms influence decisions and outcomes, not merely whether they exist. (ISSAI 100; ISSAI 3000)

6. **Limiting audit scope to environment or climate ministries alone:** In many countries, climate-relevant expenditure and decisions sit primarily in transport, agriculture, energy, infrastructure, and finance portfolios. (ISSAI 300, understanding the entity and context)
7. **Relying uncritically on self-reporting by government bodies:** Claims about emissions reductions, climate expenditure, or outcomes need independent verification where possible, particularly where financial or reputational incentives exist. (ISSAI 100, professional scepticism)
8. **Accepting climate expenditure classifications without testing their validity:** Audit teams need to examine whether reported climate spending plausibly contributes to mitigation or adaptation objectives, rather than relying on budget labels. (ISSAI 3000, credibility of information)
9. **Neglecting fraud, error, and misuse risks in climate-related schemes.** Novel measurement approaches, self-certification, and large financial incentives create vulnerabilities that warrant explicit consideration. (ISSAI 1240; ISSAI 300, risk assessment)
10. **Ignoring fossil fuel subsidies when examining climate policy coherence:** Subsidies, whether explicit or implicit, can undermine stated climate objectives and represent significant opportunity costs, especially under fiscal constraint. (ISSAI 100, coherence; ISSAI 3000)
11. **Overlooking long-term and contingent liabilities arising from climate and energy transition decisions:** Decommissioning, remediation, and stranded asset risks may fall outside current budgets but can create substantial future fiscal exposure. (ISSAI 100, consideration of risk; ISSAI 3000)
12. **Stopping audit analysis at the point where non-compliance or violations are identified:** Effective oversight requires examining whether enforcement actions were taken and whether sanctions or remedies were applied. (ISSAI 400, compliance follow-up)
13. **Framing reports exclusively around weaknesses and failures:** Demonstrating benevolence by recognizing successes, constraints, and effective practice can strengthen acceptance and uptake of audit conclusions. (ISSAI 100, balanced reporting)
14. **Issuing recommendations without a clear addressee or timeframe:** Recommendations are more likely to be implemented when it is clear who is responsible for acting and within what period. (ISSAI 3000, implementability)
15. **Attempting advanced effectiveness evaluations before foundational systems are in place:** Where data, governance, or coordination mechanisms are immature, audit impact is often stronger when starting with coherence and capacity before outcome assessment. (ISSAI 300, proportionality and feasibility)

How to use this risk list

Audit teams can use this list at multiple stages:

1. **During planning:** As a checklist of risks to consider when designing audit scope and methodology
2. **During execution:** As a reminder of common pitfalls to avoid in evidence gathering and analysis
3. **During reporting:** As a quality check on draft findings and recommendations
4. **During team training:** As a basis for discussion and capacity building

The risks are not mutually exclusive, and multiple risks may apply to any single audit.

CHAPTER 4

COMMUNICATING FINDINGS FOR IMPACT

Audit impact does not depend solely on a recommendations section at the end of a report. Every element of an audit report contributes to whether action follows, including the way findings are presented, the tone of communication, and the specificity of conclusions. The most consequential audit outputs are often not prescriptive recommendations at all, but irrefutable factual conclusions that create their own imperative for action.

The power of specific, factual conclusions

Compare these contrasting approaches:

Weak recommendation	Powerful conclusion
"The agency should improve its flood risk assessment processes and strengthen coordination with local authorities." *No one would disagree with this, nor would the SAI be able to determine whether the recommendation had been followed.*	"The infrastructure programme has increased flood risk to 15,000 additional homes compared to the start of the programme." *The quantified conclusion already shows what needs to improve.*
"The ministry should enhance its tracking systems for climate finance." *Again, no one will disagree, but the recommendation does not signal what should happen.*	The government cannot demonstrate whether its $X billion climate finance commitment has been met because Y percent of claimed contributions lack documentation of climate benefits." *The action required is clear from the conclusion.*
"The agency should develop better indicators for adaptation effectiveness." *This gives no indication of what should change.*	"Despite $X million spent on coastal adaptation over Y years, and the establishment of three interagency coordination committees, exposure to coastal flooding has increased by Z percent as development decisions continue to increase exposure faster than protection measures reduce it." *This provides a clear indication of what needs to improve, and the quantification provides a benchmark against which progress can be measured.*

These conclusions are powerful because they are factual and hard to dispute, if well-evidenced. They create their own imperative for action without being prescriptive, allow management to determine the appropriate response, and cannot easily be dismissed as interference in management decisions.

Three tests for valuable recommendations

Where SAIs do make specific recommendations, three tests help assess their value:

1. The truism test: If you cannot imagine anyone disagreeing with the recommendation, consider whether it contains actionable information. Every organization should want to improve processes. A recommendation needs to provide clarity beyond general principles.

2. The specificity test: Could the auditee claim compliance while the underlying problem persists? An agency could hold workshops, create coordination committees, and produce new assessment guidelines while 15,000 homes remain at risk. Implementation then becomes a performative exercise rather than genuine problem-solving.

3. The measurement test: How would we know if this recommendation has been implemented? How would we know if implementation actually addressed the problem? With language such as “improve” and “strengthen”, there is no clear success criterion.

Recommendations emerge from cumulative audit work

The progressive frameworks in chapters 5 and 6 demonstrate how findings and recommendations emerge naturally at each phase of audit maturity. As SAIs move from examining whether structures exist (Stage 1) to assessing whether outcomes are achieved (Stages 4–5), the character of recommendations evolves from procedural to substantive. The examples throughout those chapters show strong recommendations in context, linked to the evidence and audit approach that produced them.

The annex on recommendations provides additional good practices and examples of strong recommendations from recent audits.

Checklist for strengthening recommendations

When drafting recommendations, consider:

- ✓ Does the overall framing show genuine interest in helping, not just criticizing?
- ✓ Are recommendations specific enough to enable action but flexible enough to respect management prerogatives?
- ✓ Will decision-makers know what to do differently?
- ✓ Can the auditee implement these recommendations given their capacity constraints?
- ✓ Do recommendations address causes rather than symptoms?
- ✓ Is it clear who should do what by when?
- ✓ Is there a logical link from recommendations to findings?

SAIs adapt these principles to their national context, legal mandate, and the specific findings of each audit.

CHAPTER 5

A PROGRESSIVE FRAMEWORK FOR CLIMATE MITIGATION PERFORMANCE AUDITS

Introduction

This chapter presents a five-stage framework for performance audits of climate mitigation policies and programmes. The framework reflects patterns observed in climate audit practice globally (figure 6).

SAIs most frequently conduct audits that examine whether institutional structures and coordination mechanisms exist (Stage 1). Fewer SAIs have conducted audits that assess policy coherence (Stage 4) or comprehensive evaluations of what needs to change to close emissions gaps (Stage 5). This pattern suggests a logical progression in audit sophistication, although it is not prescriptive. When SAIs conduct audits at later stages, they typically build on earlier audit work or incorporate foundational assessments of institutional arrangements and emissions trends into their current scope.

Each stage addresses a fundamental question that structures the audit inquiry.

For each stage, this chapter sets out:

- Potential audit questions
- Sources of evidence
- Examples of what SAIs have found
- Examples of good recommendations from recent reports

The framework draws on examples of good performance audits from SAIs globally, with particular attention to approaches that resource-constrained institutions can adopt.

In practice, most audits examined in developing this guide have focused on issues at Stage 1. This concentration shapes the types of recommendations SAIs typically make. Making an impact with recommendations arising from Stage 1 audits is complicated by the fact that the bodies involved are reorganized relatively frequently. Evidence that survives institutional reorganization, such as satellite-verified outcomes, accrued fiscal liabilities, and physical infrastructure performance, has particular value for climate change audits at all stages.

Figure 6: A five-stage framework for auditing climate mitigation

This framework allows SAIs to plan audit programmes, starting with Stage 1 assessments and building towards outcome-focused work in later stages.

Addressing common challenges in mitigation audits

Auditors conducting mitigation audits encounter several recurring challenges regardless of which stage they address.

Data availability and reliability. Climate data may be incomplete, inconsistent across agencies, or collected using different methodologies. National GHG inventories typically lag 18–24 months behind real time, making it difficult to assess current performance. Some jurisdictions provide inventory data only at highly aggregated levels, complicating sectoral analysis or assessment of specific policies. Where significant discrepancies exist between national inventories and independent sources such as satellite observations or IEA estimates, auditees may be reluctant to recognize the validity of external data sources or to explain the differences transparently.

Attribution and counterfactuals. Climate policies operate over decades, and outcomes result from the interaction of multiple interventions. Distinguishing between emissions reductions driven by policy versus those resulting from economic factors or one-off events is challenging. Economic recessions reduce emissions through reduced activity rather than structural change. The shift from manufacturing to service economies reduces national emissions without representing genuine decarbonization. Pandemic-related lockdowns created temporary emissions drops that reversed when restrictions lifted. It is rarely possible for SAIs to carry out convincing counterfactual analysis to isolate the effect of specific policies.

Long timeframes and institutional continuity. Mitigation policies aim for outcomes that emerge over years or decades, often extending beyond typical audit cycles. Institutional arrangements change frequently through government reorganization, making it difficult to track accountability for long-term commitments. Coordination mechanisms established during periods of political commitment may atrophy when priorities shift. Evidence and findings that depend on specific institutional arrangements lose relevance when those arrangements are reorganized.

Future liabilities not reflected in current budgets. Decommissioning costs for fossil fuel infrastructure, remediation of abandoned sites, and stranded asset risks create fiscal obligations that materialize decades after initial decisions. These typically do not appear in current budget documents. Industries often contribute to decommissioning funds during profitable years, but seek relief as facilities approach the end of their life, effectively socializing costs. Auditors examining current fiscal positions may not immediately see these accumulating liabilities.

Technical complexity and specialized knowledge. Climate science, energy systems, and climate economics involve technical concepts that require specialized understanding. Auditors do not need to become climate scientists, but they do need sufficient familiarity with key concepts to assess whether government claims are technically credible and whether policies align with scientific understanding. This requires investment in building audit team capacity or establishing relationships with appropriate experts.

Distinguishing coordination problems from structural barriers. Many audit findings identify coordination failures, but coordination represents a means to an end rather than an end in itself. Some obstacles to emissions reduction are genuine structural barriers, such as grid capacity constraints, lack of financing mechanisms, or contradictory legal frameworks, that cannot be resolved through improved coordination alone. Auditors need to distinguish between problems that better management could resolve and those that require policy change or substantial investment.

Political sensitivity and the boundary between audit and policy prescription. Climate policies can be politically contentious. Auditors need to maintain objectivity while providing clear assessments. At Stage 5 in particular, communicating the scale of change required to meet targets risks crossing from audit into policy prescription. The challenge lies in presenting factual assessments of the gap between the current trajectory and stated commitments without dictating which specific policy instruments government ought to deploy to close that gap.

Auditors address these challenges by triangulating multiple evidence sources, being explicit about limitations in attribution, focusing on what can be verified independently, consulting appropriate technical experts, and presenting findings in ways that distinguish factual observations from value judgments. The sections on “what SAIs have found” at each stage demonstrate how auditors have navigated these challenges in practice.

5.1 Have we set up the structures to meet international commitments?

The core question:

Does the government have the institutional foundation necessary to coordinate and deliver climate action?

Potential questions for audits

Governance:

- Is there a designated ministry or agency with a clear climate mandate?
- Do coordination mechanisms exist across government ministries and levels?
- Do governance bodies actually meet regularly and make decisions?

Policy framework:

- Is there a national climate strategy aligned with NDC commitments?
- Do sectoral policies integrate climate objectives?
- Has the government updated strategy to reflect evolving international commitments?

Monitoring systems:

- Does a functioning GHG inventory system exist?
- Are there systems to track progress towards targets?
- Does the government identify and track climate-related spending in the budget?

Legal framework:

- Do climate legislation and implementing regulations exist and have legal force?
- Are enforcement mechanisms in place and functioning?
- Are there accountability mechanisms for meeting targets?

Good sources of evidence

The ClimateScanner tool (see section 2.1), provides a systematic framework for assessing governance structures, policy frameworks, and implementation arrangements (as discussed in section 3.1). This standardized approach enables rapid assessment and provides a common framework for examining climate governance. The tool examines whether coordination mechanisms exist, whether there are clear mandates, whether monitoring systems function, and whether the government allocates resources to climate priorities.

To assess whether structures function rather than merely exist, auditors review documentation from coordination bodies, including meeting records, minutes, attendance lists, and decisions taken. They also assess whether issues on the agenda are significant in terms of stated objectives and whether the cost of running meetings is proportionate to their role. Examining whether the government tracks and completes recommended actions from previous meetings can reveal whether coordination bodies have a functional role.

Budget documentation can show whether stated priorities translate into resource allocation. Brazil's TCU found that the government did not widely identify expenses directly or indirectly related to the climate agenda in the Federal General Budget, reducing transparency. Auditors can examine whether the government tags climate-related expenditures, whether spending contributes to achieving strategic priorities, and whether resources flow to the institutions supposedly responsible for implementation. The presence or absence of dedicated budget lines, the stability of funding over time, and the proportion of resources going to coordination versus delivery all provide insight into institutional capacity.

International reporting to the UNFCCC provides a useful benchmark. Countries submit biennial transparency reports, national communications, and NDC updates that describe their governance structures and monitoring systems. Annex 1 and some non-Annex 1 countries also submit annual GHG inventories. Auditors can assess whether government reporting matches domestic reality, whether the systems described in international reporting actually exist and function, and whether the government reflects internationally agreed commitments in national plans and budgets.

What SAIs have found

A pattern emerging from climate audits worldwide is that elaborate policy frameworks combined with weak implementation result in continued climate risk. A very common finding is that strong policies on paper does not automatically translate into good outcomes.

Australia's ANAO assessment of governance arrangements supporting climate commitments found them to be only partly effective, with some components, including national plans, strategies, and frameworks, yet to be delivered. Most critically, there was no overarching strategy supporting the management of the Powering Australia programme of work, meaning that the Department of Climate Change, Energy, the Environment and Water could not assess the impact of the programme's measures on Australia's climate change targets and commitments.

Coordination failures appear nearly universally. The Philippines established coordination mechanisms, but they have not functioned since 2011 (see section 3.5). Fiji's assessment revealed unclear role demarcation between agencies. The United Kingdom's adaptation board met only twice in three years despite the urgency of adaptation needs.

SAIs frequently encounter coordination problems. This partly reflects the relatively rapid turnover of administrative structures. Brazil's TCU found that the government launched climate plans but implemented them only incipiently and then discontinued them over time, disbanding essential technical groups and abolishing relevant government departments. This pattern of establishing structures during periods of political commitment, then allowing them to atrophy when priorities shift, appears across multiple jurisdictions.

Even when structures survive, they may become outdated relative to evolving commitments. Brazil established its National Policy on Climate Change in 2009, but by 2024, the TCU found it outdated in relation to international commitments the country had subsequently assumed. A related issue is the need to distinguish structures that function from those that merely exist. Coordination bodies may meet regularly but address peripheral issues rather than substantive obstacles to emissions reduction.

There is frequently a gap between declaring priorities and integrating them into the core business of government. New Zealand's audit of four councils found that all had declared climate emergencies and identified climate change as a strategic priority, but that this had not consistently translated into treating it as a priority through integrated planning, resourcing, and decision-making. Climate action can be treated as a coordination issue rather than a strategic leadership issue. Australia's ANAO found that without a guiding strategy, the government could not assess the impact of individual measures on overall climate targets and commitments.

Good recommendations from recent reports

- *"Coordinate with all relevant ministries to develop detailed roadmap considering inter-sector relationships, risk identification and mitigation plans."*
  (Indonesia)

- *" To Climate Committee (CIM) - Include energy sector mitigation plans in the National Climate Plan as legally mandated since 2009."*
  (Brazil 1)

5.2 Are we achieving our emissions reduction goals?

The core question:

Are GHG emissions actually declining at the pace necessary to meet our targets?

Potential questions for audits

Overall trajectory:

- What are the actual emissions trends over the past 5–10 years?
- Is the rate of decline sufficient to meet the 2030 and 2050 targets?
- Has the rate of decline accelerated or slowed in recent years?

Target achievement:

- What percentage reduction has been achieved against the baseline year?
- How does actual progress compare to NDC commitments?
- Has the gap to targets widened or narrowed over time?

Sectoral performance:

- Are key sectors reducing emissions successfully?
- Which sectors show stagnant or increasing emissions?
- Are the highest-emitting sectors receiving appropriate policy attention?

Policy attribution:

- Can government identify which policies are delivering emissions reductions?
- What is the expected contribution of each major policy or measure?
- How do actual reductions compare to projected contributions?

Projections versus reality:

- How accurate have past emissions projections been?
- What assumptions underpin projections, and are they realistic?

Good sources of evidence

For Annex 1 countries, and those non-Annex 1 countries that provide them, national GHG inventory reports submitted annually to the UNFCCC provide the foundation for emissions analysis. These inventories follow standardized IPCC methodologies, enabling comparison across time and between countries. Inventories typically include emissions by sector, gas type, and source category, though the level of detail varies by country capacity. For non-Annex 1 countries, national communications provide a useful source of information but tend to be less timely.

Independent emissions estimates provide a means to compare these figures with other assessments. The Emissions Database for Global Atmospheric Research (EDGAR) produces global GHG inventories using satellite data, atmospheric modelling, and international activity statistics. IEA estimates energy-related CO_2 emissions for most countries. These independent sources enable auditors to assess national inventory credibility. Unexplained divergences between national inventories and EDGAR/IEA estimates may indicate data quality issues, unreported emissions sources, or methodological problems. Auditors can examine whether the government can justify significant differences and whether explanations are technically credible.

Satellite remote sensing increasingly enables direct observation of emissions sources and land-use change. Satellite data can verify methane emissions from oil and gas facilities, flaring at production sites, coal mine fires, forest cover change, and urban expansion into carbon sinks. Several free satellite data platform, such as Sentinel, Landsat, and MODIS, provide regular imagery that auditors can use to verify claims about forest protection, renewable energy deployment, or industrial facility operation. Unlike reported data, satellite observations are independent of national institutional capacity and remain available despite government reorganizations.

Emissions projections reports show the government's own assessment of whether current and planned policies will achieve targets. Most countries produce projections showing emissions under a "current measures" scenario (existing policies only) and a "with additional measures" scenario (including policies under development). The gap between current measures projections and targets reveals how much additional effort is required. Comparing successive projection reports over time shows whether the gap is narrowing or widening.

The Climate Action Tracker and Climate Change Performance Index (discussed in section 3.4) provide comparative assessments of country progress. These independent evaluations benchmark national performance against peers and against what science indicates is necessary to meet the Paris Agreement goals.

The Climate Change Authority in Australia, and equivalent independent advisory bodies in other jurisdictions, provides expert assessment of emissions trends and the likelihood of achieving targets. Such bodies typically have access to government data and modelling but provide independent analysis.

For sectoral analysis, auditors can draw on sectoral emissions data from inventories combined with sectoral statistics on activity levels, energy use, industrial production, agricultural output, and transport patterns. The German Federal Audit Office's examination of the Energiewende, or energy transition, provides an example of sophisticated sectoral performance analysis, examining whether renewable energy deployment, grid infrastructure development, and emissions reductions are aligned with policy goals and costs.

For more timely analysis, fuel excise duty records, electricity generation data, vehicle registration statistics, and industrial production figures can provide early indicators of emissions trends before official inventories are finalized.

What SAIs have found

The Canadian Commissioner of the Environment and Sustainable Development's (CESD) November 2025 audit of federal climate finance measures provides an example of Stage 2 performance auditing (discussed in section 3.2). Examining nine financial measures projected to result in federal investments exceeding $100 billion, the audit found that the government had not implemented any of those measures effectively to reduce emissions. Most critically, the gap between expected reductions and the 2030 target had widened since the previous year's report, yet the government had not implemented additional or strengthened measures to close the gap. According to federal government data for 2023, emissions in Canada decreased by only 8.5 percent since 2005, against a 2030 target of at least 40 to 45 percent.

Australia's ANAO found that the Department of Climate Change, Energy, the Environment and Water reports annually on progress towards targets at a high aggregate level but cannot demonstrate the extent to which specific Australian government policies and programmes have contributed, or are expected to contribute, to overall emissions reduction. There was no consolidated policy-level or programme-level reporting on progress, evaluation, and decision-making across the Powering Australia programme of work.

Australia's Climate Change Authority noted that since 2009, Australia had decarbonized its economy at an average annual rate of 12 megatonnes of CO_2 equivalent per year. However, to meet its 2030 target, Australia would need to decarbonize at an average annual rate of 17 megatonnes per year, more than 40 percent faster than it had achieved historically.

Good recommendation from a recent report

"Entrepreneurs should be encouraged through the introduction of tax relief and concessionary tariff rates."
(Sri Lanka 2)

5.3 Are costs kept near the minimum needed and do polluters pay?

The core question:

Are we achieving emissions reductions cost-effectively and fairly?

Potential questions for audits

Cost-effectiveness:

- What is the abatement cost per tonne of CO_2 equivalent for major policies?
- Does government direct resources towards most-cost-effective reduction options?
- Has government assessed the relative cost-effectiveness across the policy mix?

Polluter pays:

- What percentage of emissions does carbon pricing cover?
- Are fossil fuel companies (in particular, expanding producers) required to fund the future cost of decommissioning and retraining new staff?
- Do heavy emitters pay their proportionate share of reduction costs?

Energy costs and competitiveness:

- How do industrial electricity prices compare with those of trading partners?
- Is household energy affordable for vulnerable populations?
- Are governments taking the right steps to make cheap renewable energy sources available?

Fiscal coherence:

- Is the government phasing out fossil fuel subsidies?
- Do tax incentives and subsidies work together or at cross purposes?
- Does the government recycle carbon pricing revenue to support transition?
- What is the aggregate directional effect of all government fiscal instruments on climate outcomes ?

Distributional impacts:

- Which populations bear the greatest costs of the transition?
- Are there compensatory mechanisms for vulnerable groups?
- Do regional disparities in economic impact receive attention?

Good sources of evidence

Emissions trading system registries and auction reports provide detailed evidence of permit allocation, trading, and compliance. Government balance sheets ought to incorporate estimates of provisions from climate-related sources: decommissioning obligations for fossil fuel infrastructure, remediation costs for contaminated sites, future flood protection infrastructure needs, and similar long-term commitments. The absence of such provisions may indicate that governments are deferring costs to future budgets. Government financial statements should also reflect current evaluations of contingent liabilities. Experience from coal mining, offshore oil platforms, and nuclear facilities shows that industries regularly seek relief from decommissioning obligations as facilities become less profitable, thereby transferring costs to public budgets. Auditors can examine whether adequate financial assurance is in place before production licences expire.

For assessing distributional impacts, household expenditure surveys, energy poverty statistics, and regional economic data enable analysis of who bears transition costs. Comparing energy expenditure as a share of household income across income quintiles can reveal whether climate policies are regressive. Regional employment statistics in carbon-intensive industries, combined with analysis of just transition funding, show whether support reaches affected communities.

Budget documents and tax expenditure statements reveal subsidies and fiscal incentives across sectors. Comparing climate-related spending with fossil fuel subsidies exposes contradictions between stated environmental commitments and actual fiscal policy.

OECD and IMF publish estimates of fossil fuel subsidies by country, providing benchmarks for assessing domestic subsidy levels (see section 3.8). However, the definition of a subsidy matters significantly. Some approaches count only direct budget outlays, while others include tax expenditures, below-market pricing of state-owned resources, and externalized environmental costs. Auditors need to be explicit about the methodology when citing subsidy figures.

What SAIs have found

Belgium's analysis of policy coherence examined fiscal contradictions across the climate policy mix. The audit found fossil fuel subsidies coexisting with renewable energy support, infrastructure investments locking in high-carbon pathways while the government committed to decarbonization, and sectoral policies working at cross purposes. This analysis extended beyond the simple identification of contradictions to assessment of their magnitude and cumulative impact on policy effectiveness.

CESD's 2025 audit of financial measures under the Canadian Net-Zero Emissions Accountability Act noted low initial uptake of tax credits for supporting investment in clean technologies, suggesting that design flaws prevented measures from functioning as intended. Federal investments supporting projects in the oil and gas sector faced significant risks in the transition to net-zero emissions by 2050, raising questions about whether public funds were supporting stranded assets rather than a genuine transition.

Good recommendations from recent reports

- *"Corporate Social Responsibility (CSR) expenses may be dovetailed to ensure sustainable community development around specific mines as mandated under EC so as to avoid lopsided development."*
  (India 1)

- *"Quantify environmental damage and determine: How great the actual environmental damage is, how much money the state will have to spend to eliminate damage, calculate environmental charges that motivate companies to prevent damage and use resources sustainably."*
  (Estonia)

- *"Promote use of locally produced advanced biofuels and renewable fuels; Review system of obligations for fuel suppliers; revise sanctions; Implement additional measures to reduce transport emissions by ≥14% by 2030."*
  (Lithuania)

5.4 Have governments identified and tackled barriers to achieving mitigation?

The core question:

Which specific barriers prevent our climate policies from delivering the intended emissions reductions?

Potential questions for audits

Energy trilemma:

- Has the government managed trade-offs between energy security, affordability, and emissions reduction?
- Have energy security concerns been used to justify delays in decarbonization?
- Is government action focused on promoting low-cost clean energy options?

Policy contradictions:

- Do fossil fuel subsidies coexist with carbon pricing or renewable support?
- Are infrastructure investments consistent with decarbonization pathways?
- Has the government identified and quantified major contradictions?

Implementation gaps:

- Do implementing agencies have necessary capacity and resources?
- Are enforcement mechanisms functioning?
- Is there disconnect between policy intent and operational reality?

External pressures:

- Has the government anticipated external pressure, such as with the European Union's Carbon Border Adjustment Mechanism?
- What stranded asset risks exist in fossil fuel sectors?
- Who bears liability for orphan pollution from abandoned operations?

Good sources of evidence

Audits of industry regulators, where they exist, may help define conflicting public policy objectives. For examining policy contradictions, budget documents and tax expenditure statements reveal subsidies and fiscal incentives across sectors (as discussed under Stage 3 sources).

Infrastructure investment plans and major project approvals indicate whether the government is locking in high-carbon pathways or enabling transition. Examining roads, ports, airports, and energy infrastructure approved in recent years against long-term decarbonization pathways reveals whether near-term decisions are consistent with long-term goals.

What SAIs have found

Policy contradictions appear frequently in comprehensive climate audit reports (see section 3.8). The UK NAO's report on offshore decommissioning illustrates a common pattern. While industries thrive, they are, and ought to be, required to put funds aside to meet future decommissioning costs. As they reach the end of their productive life, they become less profitable, and governments are frequently persuaded to offer some relief from this requirement in order to reduce their costs. This eventually transfers a growing share of the cost to the state balance sheet. Several European countries have seen a similar pattern in the coal industry.

Similar issues arise with groundwater extraction. Cyprus recovers only 27.6 percent of the cost of irrigation water, while aquifer extraction exceeds sustainable rates in 14 of 22 groundwater bodies (Cyprus 2). Like fossil fuel subsidies, underpriced groundwater creates overconsumption, path dependency in water-intensive agriculture, and future adaptation costs, including desalination and infrastructure. Auditors can assess water pricing alongside energy pricing, because both create vulnerability by distorting scarcity signals.

Good recommendation from a recent report

"Revise financing strategy addressing: Underutilization of petroleum revenues, Fossil vs renewable investment imbalance, Subsidy matrix distortions, Absence of carbon pricing." (Brazil)

5.5 What needs to change?

The core question:

What specific actions must the government take to close the gap between the current trajectory and climate commitments?

Potential questions for audits

Scale of the challenge:

- What is the gap between the current emissions trajectory and targets?
- At what pace must emissions decline to meet commitments?
- What is the scale of additional measures needed?

Priority reforms:

- Which policy contradictions must the government resolve first?
- What implementation gaps are most urgent?
- What quick wins could demonstrate progress?

Institutional requirements:

- What institutional strengthening is essential?
- Are measurement and accountability systems adequate?
- What capacity building is required?

Resource implications:

- What level of investment is required?
- How should the government reallocate resources?
- What subsidy reforms would free resources?

Adjustment strategies:

- Should the government rebalance sectoral priorities?
- Are the timelines realistic or do they need revisions?
- What sequencing of measures is optimal?

Good sources of evidence

Independent climate advisory bodies, such as Australia's Climate Change Authority, the United Kingdom's Climate Change Committee, and similar bodies in other jurisdictions, provide expert assessment of the gap between the current trajectory and targets. Their reports often spell out explicitly the rate of emissions reduction required, compare this with historical achievement, and assess whether the government's planned measures are sufficient.

International benchmarking enables auditors to identify policy approaches that have proven effective in peer countries (see section 3.4). OECD, IEA, IRENA, and other international organizations publish comparative analyses of climate policies, their design features, and their effectiveness. Belgium's policy analysis drew on international good practices to identify gaps in domestic approaches.

For recommendations on measurement and accountability systems, UNFCCC reporting requirements and Paris Agreement transparency frameworks provide standards that governments have already committed to meet. Auditors can refer to these international standards when recommending that the government strengthen domestic measurement and reporting systems.

Consultation with audited entities on draft findings and recommendations enables auditors to test whether recommendations are understood as intended. Findings from Australia's ANAO show that consulted departments often agree to recommendations when they are clearly linked to evidence and specify outcomes to be achieved rather than dictating implementation approaches.

What SAIs have found

Nordic SAIs have produced instructive audits examining whether voluntary approaches to climate mitigation deliver results. Norway's Riksrevisjon examined the 2019 climate agreement with the agricultural sector and found that measures within agriculture's direct control would achieve approximately 14 percent of the targeted five million tonnes of CO_2 equivalent reduction by 2030, while the largest potential, through dietary change and food waste reduction, fell under government ministries that had taken no substantive action. The audit documented that historical peatland drainage would generate additional emissions exceeding the baseline, making the target effectively unachievable.

Finland's VTV examined €470 million in energy investment subsidies from 2018 to 2023 and found no measurable output targets, incomparable data across projects, and a 90 percent approval rate, suggesting insufficient selectivity. The fundamental question of cost per tonne of CO_2 avoided could not be answered because the information systems did not support it. Denmark's Rigsrevisionen found that voluntary nitrogen reduction measures achieved just 5 percent of their target, or 240 of 5,000 tonnes (Denmark 2). Across all three countries, a common pattern emerges: voluntary agreements were chosen because they were politically easier than regulation, but they systematically underdelivered, while the governance systems in place could not detect or quantify the underperformance until audit intervention.

Australia's Climate Change Authority provided detailed quantification of the acceleration required: "To meet its ambitious new targets, Australia will need to decarbonise at an average annual rate of 17 megatons of carbon dioxide equivalent per year, more than 40 percent faster than it has since 2009."

Good recommendations from recent reports

- *"Define a transition strategy to clarify the long-term evolution of conventional biofuels on one hand, and advanced biofuels on the other, in the transport energy mix."*
  (France 1)

- *"Explore possibilities for constructing offshore wind farms in collaboration with other countries."*
  (Belgium 1)

CHAPTER 6

A PROGRESSIVE APPROACH TO CLIMATE ADAPTATION PERFORMANCE AUDITS

Introduction

This chapter examines climate adaptation policy coherence through three stages, drawing on evidence from examples around the world (figure 7). While adaptation differs fundamentally from mitigation in the ways outlined below, the framework applies across diverse national contexts.

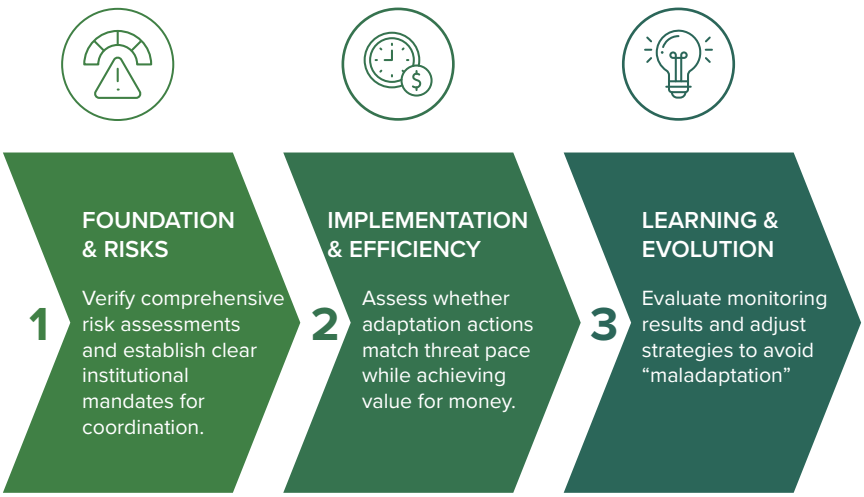
The framework reflects patterns observed in adaptation audit practice. SAIs most frequently conduct audits that examine whether climate risks have been assessed and institutional structures established (Stage 1). Fewer SAIs have examined whether adaptation is happening at appropriate speed, cost, and sequencing (Stage 2), and fewer still have assessed whether countries are learning from implementation and avoiding maladaptation (Stage 3). When SAIs conduct audits at later stages, they typically build on earlier audit work or incorporate foundational assessments into their current scope.

How adaptation differs from mitigation

While mitigation can be measured against a relatively small number of targets, principally through net GHG emissions, adaptation involves managing many diverse, context-specific risks. In the reports examined, these include extreme weather events, flooding, coastal erosion, and saltwater intrusion affecting agriculture, sea-level rise, wildfires, desertification, and bio-diversity loss. Each requires different technical responses, institutional arrangements, and community engagement strategies.

Adaptation benefits are local and often immediate, creating different political economy dynamics. A seawall in Fiji provides no protection to Tonga. Community water tanks in Tonga do not address New Caledonia's coastal erosion. This localized nature means that adaptation cannot rely on global collective action frameworks that drive mitigation policy.

Figure 7: The three-stage path to climate adaptation



Adaptation outcomes are often counterfactual. They represent damages avoided rather than benefits delivered, for example, the reduction in soil erosion from maintaining ground cover in dry or wet seasons. This makes demonstrating value for money and justifying continued investment fundamentally more difficult than for mitigation.

Adaptation is inherently cross-cutting, requiring coordination across multiple sectors and governance levels. Mitigating the cost of flooding, for example, requires coordination between physical infrastructure and spatial planning policy.

Adaptation operates under deep uncertainty about how fast the climate will change, which impacts will manifest first, and which approaches will prove most effective. This framework examines both forward-looking learning (incorporating new science and adjusting strategies) and backward-looking learning (identifying what went wrong and catching maladaptation). Maladaptation—well-intentioned actions that worsen the underlying problem or create new vulnerabilities—represents the adaptation equivalent of fossil fuel subsidies in mitigation policy (see section 6.3)

Evidence that is independent of official reporting lines, and therefore survives institutional reorganization, is particularly critical for adaptation. Satellite-verified land-use change, independently measured sea-level rise, and fiscal liabilities from disaster losses provide durable accountability mechanisms that persist regardless of which ministry holds responsibility for adaptation policy.

Common challenges in adaptation audits

Auditors conducting adaptation audits encounter several recurring challenges regardless of which stage they address.

Counterfactual outcomes and attribution. Adaptation success is inherently counterfactual, requiring measurement of damages avoided against an unknowable scenario of what would have happened without intervention. Benefits may not be evident for decades, requiring comparison against an uncertain future climate. A seawall may appear successful because no major flooding occurred, but without knowing whether a major storm would have caused damage in its absence, demonstrating value is difficult. This creates challenges for accountability. Governments face political pressure to show results, yet the most successful adaptation may be invisible precisely because it prevented damage.

Measuring effectiveness without standard frameworks. There is no standard monitoring and evaluation framework for adaptation because appropriate approaches are context dependent. What constitutes successful coastal adaptation in small island states differs fundamentally from drought adaptation in continental regions. Auditors cannot apply a single effectiveness template across different adaptation contexts. This means that audit teams must develop context-appropriate assessment criteria for each audit, drawing on climate science, local vulnerability assessments, and international good practice without being able to rely on standardized benchmarks.

Dependence on upstream steps. Monitoring and evaluation systems depend on well-functioning upstream steps. If risk assessments are incomplete or baselines absent, meaningful monitoring becomes impossible. Auditors may find that the absence of baseline data makes it impossible to assess whether adaptation investments reduced vulnerability or enhanced resilience, even where substantial spending has occurred. This creates a dilemma, whether to report that effectiveness cannot be assessed (which may be interpreted as lack of audit competence) or focus on the upstream failure to establish baselines (which may not directly address the question of whether adaptation is working).

Long timeframes and institutional instability. Climate risks intensify over decades, but adaptation infrastructure and policies must be maintained continuously throughout this period. Governments reorganize frequently. Coordination mechanisms established during periods of political commitment may atrophy when priorities shift. Adaptation plans developed by one administration may be ignored by the next. Auditors examining long-term adaptation effectiveness must trace accountability across multiple governments and institutional arrangements, with evidence often fragmentary or lost during reorganizations.

Distinguishing reactive response from anticipatory adaptation. Much government action labelled as adaptation is actually reactive disaster response. Strengthening flood defences after catastrophic flooding, developing drought plans after severe water shortages, or upgrading coastal protection after storm damage may be necessary but does not represent anticipatory adaptation to future climate

change (discussed in section 3.10). Auditors need to distinguish between these, yet the government may present all such spending as adaptation. The political economy often favours reactive spending: responding to disasters generates immediate political benefits, while investing in adaptation to risks that have not yet materialized may be less visible and harder to justify.

Understanding deferred and contingent liabilities. Future liabilities from adaptation infrastructure create fiscal obligations that may not appear in current budgets. Seawalls require maintenance over decades. Relocated communities need ongoing services. Disaster insurance schemes accumulate actuarial deficits. Auditors examining cost-effectiveness need to include these deferred and contingent liabilities, not just current cash expenditures, particularly given that climate risks are increasing and adaptation infrastructure may become obsolete faster than originally projected.

Technical complexity across multiple domains. Adaptation auditing requires understanding not only climate science but also hydrology, coastal engineering, agricultural systems, public health, infrastructure planning, and ecosystem management, depending on the audit scope. Auditors cannot become experts in all these domains, but they need sufficient understanding to assess whether adaptation measures are technically sound and align with climate projections. This requires either building diverse expertise within audit teams or establishing relationships with appropriate external experts, both of which have resource implications.

Focus on enabling actions. NAPs frequently focus on enabling actions, such as policy, planning, and coordination, rather than measurable outcomes. Central plans may imply action across multiple levels of government. This makes it difficult to track action, both for governments and for auditors.

Equity and vulnerability assessment. Determining which populations are most vulnerable to climate impacts requires combining climate data, socio-economic information, and local knowledge. Official vulnerability assessments may not reflect actual risk distribution, particularly where marginalized communities lack political voice. Auditors examining whether adaptation prioritizes the vulnerable must assess both the technical quality of vulnerability assessments and whether these translate into resource allocation. This can put auditors in the position of questioning not only whether the government followed its own priorities but whether those priorities correctly identified vulnerability.

Auditors address these challenges by focusing on what can be verified independently, being explicit about limitations in attribution, examining whether the government has made reasonable provisions for foreseeable risks even where precise outcomes remain uncertain, and presenting findings in ways that acknowledge the genuine difficulties of measuring adaptation effectiveness while still holding the government accountable for rational resource allocation and sound decision-making. The “what SAIs have found” sections at each stage demonstrate how auditors have navigated these challenges in practice.

Challenges specific to Small Island Developing States and resource-constrained contexts

Pacific audits revealed particular challenges: geographic dispersion making systematic data collection across island groups extremely difficult; multiple parallel reporting systems (government, donors, and implementing organizations) that are not integrated; dependence on external funding with donor priorities sometimes driving project selection rather than national risk assessments; and difficulty demonstrating value for money when adaptation involves irreplaceable cultural heritage. These challenges are not unique to Pacific Small Island Developing States but appear with particular intensity in resource-constrained contexts.

6.1 Have we assessed climate risks and established structures to address them?

The core question:

Does the government understand what climate risks it faces and have the institutional foundation necessary to coordinate and deliver adaptation action?

Unlike mitigation, where the target is clear, namely reducing net emissions, adaptation first requires an understanding of what needs to be adapted to. Without robust risk assessment, adaptation becomes reactive crisis management rather than strategic risk reduction. However, risk assessment alone is insufficient. The government must also have functional institutional arrangements to act on that knowledge.

Good sources of evidence

The Notre Dame Global Adaptation Initiative (ND-GAIN) Country Index (discussed in section 3.4) provides vulnerability and readiness scores based on 45 indicators across six sectors, enabling auditors to benchmark national vulnerability against that of peers. The Global Climate Risk Index, published by Germanwatch, quantifies the impacts of weather-related events, helping auditors situate national climate impacts in an international context. ISO 31000 and ISO 14091 provide relevant frameworks.

The IPCC Assessment Reports, particularly Working Group II on Impacts, Adaptation, and Vulnerability, provide authoritative scientific consensus, with regional chapters offering downscaled projections. NAPs provide the government's own assessment of adaptation priorities and serve as natural audit criteria. UNFCCC reporting requirements under the Paris Agreement, including National Communications, Biennial Transparency Reports, and NDC submissions, describe countries' adaptation priorities and can be assessed for consistency with domestic plans and budgets.

Satellite remote sensing provides independent verification of several adaptation-relevant risks (discussed in section 3.7). Sea-level rise can be verified through satellite altimetry data (freely available from the National Aeronautics and Space Administration and the European Space Agency). Coastal erosion

Potential questions for audits

Risk assessment:

- Has the government conducted comprehensive climate risk and vulnerability assessments based on current climate science?
- Have risks been quantified where possible, including potential economic damages and populations affected?
- Is risk information actually accessible to, and used by, decision-makers?
- Can risk assessments be verified against independent data sources such as satellite observations?
- Does the government periodically update and improve risk and vulnerability assessments?
- Has the government prioritized adaptation measures to address the highest risks identified?

International commitments:

- Has the government developed a NAP as committed under the Paris Agreement?
- Does the NAP align with commitments under the Sendai Framework for Disaster Risk Reduction?
- Are climate risks integrated into progress towards the Sustainable Development Goals?

Institutional structures:

- Is there a designated ministry or agency with a clear adaptation mandate?
- Do coordination mechanisms exist across government ministries and levels?
- Do governance bodies actually meet regularly and make decisions?
- Does the national budget track climate adaptation spending?

Legal and policy framework:

- Do climate legislation and implementing regulations exist and have legal force?

can be tracked through time-series satellite imagery comparing coastline positions, including Sentinel and Landsat data. Land degradation and desertification can be observed through vegetation indices derived from satellite data. Unlike reported data, these satellite observations are independent of national institutional capacity and remain available despite government reorganizations.

The PEFA Climate Supplement, published in April 2025, provides standardized frameworks for assessing how countries integrate climate considerations into public financial management, including whether climate risks feature in fiscal risk statements.

For coordination assessment, stakeholder mapping exercises can identify gaps and overlaps in institutional responsibilities. Budget documentation showing climate adaptation spending across ministries reveals the depth of mainstreaming (see section 3.5). Meeting minutes and progress trackers demonstrate whether coordination mechanisms function beyond formal structures.

What SAIs have found

The Tanzanian SAI, examining desertification, found that the Prime Minister's Office lacked updated statistics, with the last comprehensive data covering 2014 to 2019, making measuring programme performance impossible. The NAP had been implemented without establishing baseline conditions.

Fiji's SAI found that while the country developed a comprehensive NAP in 2018 with detailed climate risk assessments, only one progress report had been prepared five years into the 10-year NAP term, and no system existed to update risk assessments promptly as new climate data became available.

Malta's SAI found that the first economy-wide Climate Vulnerability and Risk Assessment would not be completed until 2025 due to data and knowledge gaps. The existing flood risk assessment did not reflect recent demographic changes.

The Tanzanian SAI found that the Ministry of Agriculture was not included in desertification planning despite family farmers being the most vulnerable population. The Spanish and Portuguese SAIs found that agricultural and water resource policies were not adequately coordinated and sometimes even contradicted each other.

Verifying risk assessment quality without relying solely on government-provided data presents challenges. Independent data sources, such as satellite observations of land-use change, sea-level measurements from tide gauges and satellite altimetry, and global climate datasets, enable auditors to assess whether national risk assessments reflect physical realities. These verification sources are particularly valuable in contexts where institutional capacity for risk assessment is limited or where the government may have incentives to understate climate risks.

Adaptation is frequently mainstreamed into activities that already exist. It can therefore be challenging to show that existing bodies have changed their focus sufficiently to meet adaptation goals.

Good recommendation from a recent report

"Establish a climate change body with a workable framework to effectively coordinate arrangement for institutional, and stakeholder engagement at the national, provincial and community level for sea level rise and coastal erosion."
(Solomon Islands)

6.2 Is adaptation happening at appropriate pace and cost, and is it appropriately sequenced?

The core question

Is the government allocating limited resources rationally based on risk, implementing adaptation at a pace commensurate with climate threats, and achieving value for money?

Good sources of evidence

The ND-GAIN vulnerability scores enable auditors to compare stated priorities against actual resource allocation. Are the most vulnerable sectors receiving proportionate investment? NAPs often specify prioritization criteria, providing natural audit benchmarks.

Financial records showing budget allocations across adaptation projects, sectors, and regions enable systematic comparison. The UK NAO's modelling approach (see section 3.9), examining spending per property at risk and per kilometre of watercourse, demonstrates how auditors can assess whether spending patterns align with risk distribution.

For mainstreaming assessment, review of building codes, infrastructure design standards, and technical specifications reveals whether climate projections have been incorporated. National budget documents showing climate budget tagging (see section 1.1) across ministries indicate the depth of integration. Community Development Plans enable comparison of locally identified priorities with government spending patterns.

The PEFA Climate Supplement provides frameworks for assessing whether climate considerations are integrated into budget processes. The IDI/INTOSAI WGEA Climate Change Adaptation Audit Framework provides structured approaches for examining prioritization, with particular attention to equity (see sections 2.1 and 3.3).

Potential questions for audits

Prioritization framework:

- Does the government have explicit frameworks for prioritizing adaptation investments?
- What criteria guide decisions—urgency, vulnerability, cost-effectiveness, or political considerations?
- Are the most climate-vulnerable populations receiving priority for adaptation resources?
- Is there a clear, actionable implementation plan?

Implementation speed:

- What percentage of planned adaptation actions have been completed?
- Is implementation pace keeping up with accelerating climate risks?
- Are delays concentrated in particular sectors or jurisdictions, and if so why?

Adequacy and value for money:

- Is adaptation funding adequate relative to the level of risk faced?
- Does spending produce measurable risk reduction?
- Are there wide, unexplained variations in spending levels between regions?
- Have future maintenance costs and contingent liabilities been incorporated into investment decisions?

Mainstreaming as an implementation enabler:

- Are climate risks adequately considered in infrastructure planning and building codes?
- Have technical standards been updated to reflect climate projections?
- Are national adaptation strategies translated into actionable plans at regional and local levels?

What SAIs have found

The UK NAO found wide variations in local authority spending that raised questions about prioritization. Investment per property at risk varied from £1,937 in South West England to £5,942 in the North East, more than three times higher. The Environment Agency applied national prioritization, but the SAI was concerned funding might be determined by availability of partner contributions rather than relative risk levels.

On implementation speed, the Tanzanian SAI found 67 percent of NAP activities were not implemented. Albania's SAI found only 15 percent of adaptation measures were fully implemented over 2019–2023, attributing this to lack of risk assessment tools, limited technical staff, and insufficient funding.

The Irish SAI found that by March 2024, of 67 sub-actions under the NAP, 37 were complete, 27 were on schedule, and 3 were behind schedule, demonstrating relatively strong implementation compared to other jurisdictions.

Fiji's SAI found significant gaps in financial planning undermining prioritization. While the NAP outlined indicative budgets, detailed costs remained unidentified at the sector, ministry, and project levels five years into implementation.

Governments frequently lack explicit, transparent prioritization frameworks, making it difficult for auditors to assess whether resource allocation follows rational criteria. Even where frameworks exist on paper, actual spending patterns often diverge from stated priorities. Auditors, therefore, need to assess whether the resource implications of adaptation infrastructure, as discussed in the challenges above, are reflected in budget plans and whether explicit and implicit guarantees are included as (contingent) liabilities.

Cost-benefit analysis for adaptation is challenging because benefits are often counterfactual, representing damages avoided rather than value created, and materialize over long timeframes. This makes it difficult to assess value for money using traditional economic appraisal methods.

Pacific audits revealed additional challenges specific to Small Island Developing States: dependence on external funding, with donor priorities sometimes driving project selection rather than national risk assessments; difficulty demonstrating value for money when adaptation involves irreplaceable cultural heritage; and lumpy investment requirements that strain budgets.

Good recommendations from recent reports

- *"Develop a detailed implementation plan so that the progress of NAP progress implementation can be assessed and be able to forecast future NAP updates, particularly addressing: how the ministry will achieve its adaptation objectives and commitments, identifying concrete, prioritized actions with timelines to respond to climate change impacts on Executing Agencies areas of responsibility, based on evidence from climate change risk assessments, clearly identifies roles and responsibilities, including who is responsible for overseeing the plan and which departments and agencies are accountable for implementing the actions; and Plans progress that is measurable and reported on."*
  (Fiji)

- *"Quantify the adaptation funding gap, Create a financial roadmap aligned with EU Taxonomy, Ensure funding sufficiency and tracking."*
  (Malta 1)

6.3 Are countries learning from implementation and avoiding maladaptation?

The core question:

Is the government monitoring effectiveness, incorporating new climate science, adjusting strategies based on evidence, and avoiding interventions that increase vulnerability?

Potential questions for audits

Monitoring and evaluation:

- Has the government established systems for monitoring climate impacts and adaptation outcomes?
- Are monitoring data actually used to inform decisions, or collected but not applied?
- What mechanisms exist for learning from adaptation projects and sharing lessons across government?

Incorporating new science:

- Does the government incorporate new IPCC findings and climate science into planning?
- Have adaptation strategies been revised in response to new information or implementation experience?

Avoiding maladaptation:

- Has the government assessed whether adaptation actions could increase vulnerability elsewhere geographically or temporally?
- Are there mechanisms to identify unintended consequences before implementation?
- For coastal or water projects, has the government assessed long-term sustainability and whether interventions create problems in adjacent areas?
- Are adaptation policies in one sector undermining adaptation in other sectors?

Good sources of evidence

Process-based metrics, such as completion of plan elements, the number of risk assessments conducted, and the number of projects incorporating climate considerations, provide measurable indicators even when outcome measurement proves elusive.

IPCC Assessment Reports are published every five to seven years with updated climate science. Auditors can assess whether the government has revised adaptation strategies in response to new findings. The UNEP *Adaptation Gap Report*, published annually, assesses global adaptation progress and identifies emerging good practices.

For maladaptation assessment, project documentation, including environmental and social impact assessments, provides essential evidence, supplemented by site visits to observe actual effects. Spatial data showing vulnerability distribution and adaptation project locations enable auditors to identify potential displacement of risk. Satellite and aerial images, particularly time-series images, provide high-value evidence of physical changes over time (see section 3.7). A growing number of SAIs have used this source of evidence, including the SAIs of Colombia, India, and Maldives and Europe's ECA.

The IPCC Working Group II reports include extensive discussion of common maladaptation patterns. ECA's identification of maladaptation examples, such as promoting irrigation in arid areas and constructing dykes instead of relocating residents, provides a framework for recognizing similar patterns. The ECA also provides an example of a forward-looking assessment: "climate change scenarios indicate an increasing vulnerability to desertification in the European Union throughout this century, with an increase in temperature and droughts and less precipitation in the southern parts of Europe. Its effects will be particularly acute in southern Portugal, a large part of Spain, southern Italy, southeastern Greece, Cyprus, and the Bulgarian and Romanian coasts". The SAIs of Spain and Portugal took this analysis on board in their coordinated audits of desertification risks.

Stakeholder consultations with affected communities, implementing agencies, and adjacent jurisdictions reveal unintended consequences that may not appear in official reports. Interviews with community members can describe outcomes not captured in government monitoring systems. Evaluation of spending patterns, and of changes in spending patterns (for example, how much is spent on maladaptation) can add value to an audit of this kind.

What SAIs have found

The Tanzanian SAI found that the Vice President's Office had developed monitoring and evaluation indicators for the NAP, but these were not integrated into routine monitoring systems. Annual action plans did not incorporate climate change adaptation indicators and targets.

Fiji's SAI found that, while Fiji launched a Monitoring and Evaluation Framework in October 2019, it provided only guidance on how a system should be designed rather than establishing an operational system.

The Irish SAI found mixed progress on interim adaptation indicators between 2019 and 2023. Two indicators relating to flood mapping were achieved, but two indicators on scheme adaptation plans showed very little or no progress over the four-year period.

On maladaptation, the Spanish and Portuguese SAIs found water-intensive crops being cultivated in arid regions, irrigation being expanded while aquifers were over-exploited, and subsidy systems incentivizing unsustainable land-use practices. Government policies intended to support agriculture were simultaneously undermining adaptation to desertification.

Colombia's SAI, examining coastal erosion adaptation, found that despite inclusive planning principles on paper, communities were largely unaware of adaptation plans and had minimal involvement in decision-making, undermining both equity and likely effectiveness of interventions.

The UK NAO noted that while the government constructed flood defences, policies simultaneously permitted excessive groundwater extraction in some areas, leading to land subsidence that progressively reduced the effectiveness of those same flood defences.

Identifying maladaptation is both technically and politically difficult. It requires distinguishing between coordination failures, which can be resolved through better management, and genuine design flaws, which require the intervention to be rethought. Not every implementation problem constitutes maladaptation. Auditors need to be alert to the risk that some interventions may in fact increase vulnerability or create new risks.

Centralized data platforms for tracking adaptation actions across government are typically non-existent or not tailored to adaptation's cross-cutting nature.

Pacific audits revealed particular monitoring challenges for Small Island Developing States, including geographic dispersion, which makes systematic data collection across island groups difficult, and the existence of multiple parallel reporting systems (by government, donors, and implementing organizations) that are not integrated.

Good recommendations from recent reports

- *"Regularly monitors and publishes annual reports on the progress and success of implementation of its climate change actions, using appropriate performance indicators, and takes action to adapt and improve implementation, where needed."*
  (Solomon Islands)

- *"Provide guidance on actions relevant to climate adaptation and provide member states with examples of projects leading to maladaptation."*
  (ECA 4)

- *"Use VRA results to adjust priorities. Conduct continuous training with stakeholders including non-government sectors."*
  (Philippines)

CHAPTER 7

A PROGRESSIVE APPROACH TO CLIMATE COMPLIANCE AUDITS

Introduction

This chapter examines compliance with climate legislation and regulations through five stages, drawing on evidence from examples around the world (figure 8). Compliance audits assess whether government entities and regulated actors follow legal requirements, differing from performance audits, which examine whether policies achieve their intended results.

The framework reflects patterns observed in climate compliance audit practice. SAIs most frequently examine whether climate legislation exists and whether implementing regulations have been developed (Stages 1–2). Fewer SAIs have examined whether compliance mechanisms function effectively (Stage 3) or whether entities actually comply with requirements (Stage 4). Fewer still have assessed whether enforcement actions are taken when non-compliance is identified (Stage 5). When SAIs conduct audits at later stages, they typically build on earlier audit work or incorporate foundational assessments into their current scope.

Climate compliance audits can examine both the government's own compliance with legislative requirements (for example, emission reduction targets, mandatory climate risk disclosure, or statutory reporting obligations) and the government's oversight of private sector compliance (for example, with building standards, emission permits, or mandatory carbon pricing).

Common challenges in compliance audits of climate legislation

Auditors conducting compliance audits of climate legislation encounter several recurring challenges, regardless of which stage they address.

Vague legal obligations. Climate legislation frequently establishes aspirational goals without specifying enforceable requirements. Laws may commit the government to "take all reasonable steps" or "give due consideration" to climate impacts without defining what constitutes compliance. This leaves auditors uncertain whether to assess compliance against the literal text, which may be unenforceable, or against reasonable interpretations of legislative intent. Unlike financial compliance, where regulations specify precise requirements, climate legislation often provides only general direction, requiring auditors to develop their own compliance criteria.

Figure 8: Compliance audits: From legislation to enforcement

Incomplete regulatory frameworks. Legislation may delegate authority to develop implementing regulations, but those regulations may remain unpublished years after enactment. Without regulations specifying how legislative provisions operate in practice, auditors cannot assess whether implementation complies with legislative requirements because those requirements remain undefined. This is particularly common where legislation establishes new institutional arrangements or reporting requirements but does not specify operational details.

Long implementation timeframes. Climate legislation typically establishes targets extending decades into the future. Auditors examining compliance several years after enactment may find that most legislative obligations are not yet due, making compliance assessment premature. This creates tension between the value of early audit (identifying problems when correction is still possible) and the difficulty of assessing compliance before deadlines arrive.

Attribution across government. Climate legislation often imposes obligations on the government without specifying which ministry or agency bears responsibility. When auditors find non-compliance, identifying the accountable entity proves difficult. Multiple agencies may claim they lack authority, each pointing to others as responsible. This differs from financial compliance, where spending authority and accountability are typically clear.

Enforcement mechanisms absent or unused. Climate legislation frequently lacks enforcement provisions or establishes mechanisms that the government never invokes. Laws may require reporting without specifying consequences for non-reporting or establish oversight bodies without funding or legal powers. Auditors can document that enforcement mechanisms are unused, but assessing whether this represents non-compliance (if the government had discretion over whether to enforce) or policy failure (if enforcement was intended but not operationalized) requires careful legal interpretation.

Measuring compliance with procedural versus substantive obligations. Some climate legislation imposes procedural requirements, such as conducting impact assessments, consulting stakeholders, or publishing reports, while other provisions establish substantive outcomes, such as reducing emissions by specified amounts or achieving adaptation targets. Procedural compliance can be verified through documentation, but substantive compliance requires measuring real-world outcomes. Auditors may find that the government has complied with all procedural requirements while failing to achieve substantive goals, or conversely, achieved substantive outcomes through means not specified in legislation. Determining which represents compliance requires careful attention to legislative intent.

Technical standards and scientific uncertainty. Climate legislation may require compliance with technical standards that themselves evolve as science advances. Emissions measurement methodologies, climate risk assessment frameworks, and adaptation effectiveness indicators all change as understanding improves. Legislation passed in 2015 may reference methodologies that have been superseded by 2025. Auditors must determine whether compliance requires following the methodology specified when legislation was enacted or the current best practice.

Mandatory reporting versus actual use of information. Much climate legislation imposes reporting requirements, such as publishing climate risk statements, disclosing emissions, or reporting on adaptation progress. Auditors can readily verify whether reports were published on schedule and contain the required elements. However, assessing whether these reports actually inform decision-making, which is often the presumed legislative intent, requires examination of budget processes, policy development, and investment decisions. Reports may be technically compliant but effectively ignored.

Evolving expectations for sustainability and emissions reporting. Reporting standards for GHG emissions are changing rapidly as governments and international bodies develop more comprehensive frameworks. Many jurisdictions are moving from reporting only direct emissions (Scope 1) to including indirect emissions from purchased energy (Scope 2) and value chain emissions (Scope 3). The boundary between what must be reported and what remains voluntary is shifting. Governments are increasingly expected to report climate-related information alongside financial statements, following frameworks like the Task Force on Climate-related Financial Disclosures or the International Sustainability Standards Board.

The situation is further complicated by different reporting frameworks using inconsistent emissions categories and calculation methodologies. What constitutes compliance with emissions reporting requirements depends partly on which framework

is applied. Private sector entities may be subject to multiple reporting regimes simultaneously (domestic legislation, securities regulation, and voluntary frameworks), creating complexity in determining which requirements are mandatory and which represent good practice. For auditors in resource-constrained contexts, this rapidly evolving landscape presents particular challenges. Building capacity to audit against one framework may be undermined when that framework is superseded or supplemented by new standards requiring different technical expertise.

Political sensitivity of enforcement findings. Unlike financial compliance, where overspending is straightforwardly problematic, climate compliance involves contested policy choices. Auditors reporting that government has not complied with emissions reduction targets may be perceived as taking positions on economic policy, energy transitions, or development priorities. This can generate political pushback beyond what financial compliance audits typically encounter, particularly where compliance would require economically costly interventions or restrictions on particular industries.

International versus domestic obligations. Many countries' climate commitments appear in both domestic legislation and international agreements, such as Paris Agreement NDCs and regional treaties. These may not be perfectly aligned. Auditors must determine whether to assess compliance against domestic law, international commitments, or both, and how to address cases where compliance with one would constitute non-compliance with the other.

Auditors address these challenges by being explicit about which legal provisions they are assessing, seeking legal advice on the interpretation of ambiguous provisions, focusing on obligations that have clearly fallen due, and distinguishing between technical non-compliance (failure to meet procedural requirements) and substantive failure (not achieving legislative goals). The "what SAIs have found" sections at each stage demonstrate how auditors have navigated these challenges in practice.

7.1 Does enabling legislation create clear obligations?

The core question:

Has the government enacted legislation establishing climate-related obligations, and are those obligations sufficiently clear to be enforceable?

Potential questions for audits

Existence of legislation:

- Has climate legislation been enacted into law?
- Does legislation cover both mitigation and adaptation, or only one?
- Are international commitments (Paris Agreement, regional treaties) incorporated into domestic law?

Clarity of obligations:

- Does legislation specify measurable targets with defined timeframes?
- Are responsibilities assigned to specific government entities?
- Can compliance be objectively verified, or are obligations too vague to enforce?

Legal status:

- Is climate legislation primary legislation or subsidiary regulation?
- Can legislative requirements be overridden by conflicting laws or ministerial decisions?
- Do sunset clauses or review provisions affect legal force?

Good sources of evidence

The Grantham Research Institute's Climate Change Laws of the World database catalogues climate legislation globally, enabling auditors to compare national frameworks against those of international peers and identify gaps. The database includes legislative text, dates of enactment, and policy summaries.

UNFCCC national communications and NDC submissions describe countries' legal frameworks for implementing Paris Agreement commitments, although these may present aspirational descriptions rather than actual legal status.

Constitutional provisions and framework legislation establish the hierarchy of legal instruments, helping auditors determine whether climate legislation can be overridden by sector-specific laws or whether it takes precedence.

Legislative history, including parliamentary debates, committee reports, and government explanatory memoranda, reveals legislative intent, particularly useful when statutory language is ambiguous.

Comparative legal analysis examining how other jurisdictions have structured climate obligations provides benchmarks for assessing whether national legislation establishes enforceable requirements or merely aspirational goals.

What SAIs have found

The UK Climate Change Act 2008 established legally binding carbon budgets in five-year periods extending to 2050, providing clear numerical targets against which compliance could be measured. This contrasted with jurisdictions where climate legislation established only aspirational goals.

The German SAI found that Germany had translated the Paris Agreement commitments into domestic legislation, but some legislation did not provide clear implementation pathways.

Several Pacific SAIs found climate legislation had remained in draft form years after being announced, leaving climate action without a legal foundation. Tuvalu's draft Climate Change and Disaster Survival Fund Bill had not been enacted despite being critical to implementing adaptation financing.

The Canadian Commissioner of the Environment and Sustainable Development found that while the 2018 Greenhouse Gas Pollution Pricing Act established carbon pricing, the legislation did not specify how carbon price increases would be determined beyond 2022, creating uncertainty about future compliance obligations.

Malta's SAI found that climate legislation was fragmented across multiple laws and regulations without an overarching framework, making it difficult to identify what obligations existed and which entities were responsible for compliance.

Auditors examining legislative clarity often find that climate laws establish targets but do not specify intermediate milestones, making it impossible to assess whether the government is on track for compliance until target dates arrive. This undermines accountability during the critical implementation period.

Climate legislation may incorporate international commitments by reference without reproducing them in domestic law, creating legal uncertainty about whether those commitments are directly enforceable in national courts.

Good recommendations from recent reports

- *"Enact climate legislation to provide legal foundation for climate action." (Tuvalu)*
- *"Amend the Water Act, Waste Act, and Air Protection Act to establish environmental-use accounting methodologies/guidelines." (Estonia)*

7.2 Are implementing regulations and technical standards in place?

The core question:

Has government developed the detailed regulations, technical standards, and procedural requirements necessary to operationalize legislative obligations?

Potential questions for audits

Regulatory development:

- Have regulations required by legislation been promulgated on schedule?
- Do regulations specify compliance requirements in sufficient detail to be enforceable?
- Have technical standards been updated to reflect legislative requirements?

Completeness:

- Are all legislative provisions supported by implementing regulations, where required?
- Do regulations address practical implementation questions left open by legislation?

Technical specifications:

- Have emission measurement methodologies been specified?
- Have building codes and planning regulations been updated to reflect climate requirements?
- Are there technical standards for climate risk assessment and adaptation planning?

Procedural requirements:

- Do regulations specify reporting formats, deadlines, and submission processes?
- Are there clear procedures for compliance verification and enforcement?

Good sources of evidence

Government gazettes, or equivalent official publications, show whether regulations have been promulgated and when they entered into force. Comparing gazette publication dates against legislative deadlines can reveal delays.

Regulatory impact assessments conducted during regulation development explain policy choices and may reveal technical challenges or political compromises affecting regulatory stringency.

Building codes, planning regulations, and technical standards, particularly revisions following climate legislation, demonstrate whether regulatory frameworks have been updated.

Industry guidance documents published by regulatory agencies show how the government interprets compliance obligations and what it expects from regulated entities.

Stakeholder consultation records during regulation development reveal the issues raised and how the government responded, providing insight into regulatory choices.

International standards from bodies like ISO, GHG Protocol, or sector-specific organizations provide benchmarks for assessing whether national technical standards reflect current good practice.

What SAIs have found

The Albanian SAI found that five years after climate legislation was enacted, 60 percent of implementing regulations remained unpublished, leaving many legislative provisions unenforceable in practice.

Ireland's SAI found that while the Climate Action and Low Carbon Development Act 2015 required sectoral adaptation plans, detailed guidance on plan preparation was not published until 2018.

The UK NAO found building regulations had not been updated to require new construction to meet net-zero standards, meaning buildings constructed in compliance with current regulations would later require expensive retrofitting to meet climate targets.

Indonesia's SAI found that emissions measurement methodologies used by different ministries were inconsistent, making it impossible to aggregate national emissions or verify compliance with reduction targets.

The ECA found that while EU legislation required member states to consider climate resilience in infrastructure planning, technical standards specifying how to assess resilience under different climate scenarios did not exist, leaving the legal requirement effectively unimplementable.

Regulatory delay is common. Legislation delegates technical details to regulations to maintain flexibility, but this creates opportunities for indefinite postponement when regulations prove politically difficult or technically complex.

Where legislation requires entities to "take climate into account" or "consider climate risks" without specifying methodologies, even well-intentioned actors may not know what compliance requires. Auditors find wide variation in how entities interpret such requirements in the absence of technical standards.

Regulations developed without adequate technical capacity may be poorly designed, creating compliance obligations that are unnecessarily costly or technically infeasible. Auditors may find that regulated entities cannot comply, not because they are unwilling but because regulatory requirements are impractical.

Good recommendations from recent reports

- *"Provide clear environmental-use accounting requirements within environmental permits, including device specifications and data-retention references."*
  (Estonia)

- *"Establish mechanisms for collecting, analysing, reporting, disseminating baseline data. Develop validation and verification measures."*

- *"Create standardised contractual procedures and templates. Ensure Attorney General vets agreements".*
  (Tanzania 1)

- *"Develop and report publicly on key performance indicators and targets that are consistent, measurable and demonstrate performance and outcomes against the requirements for rehabilitation set out in the Mining Act 1992 and Mining Regulation 2016"*
  (Australia 2)

7.3 Are compliance mechanisms and oversight systems functioning?

The core question:

Do the institutional arrangements for monitoring, verifying, and ensuring compliance actually operate as intended?

Potential questions for audits

Institutional capacity:

- Do regulatory agencies have staff with the necessary technical expertise?
- Are compliance monitoring systems adequately funded?
- Have staff been trained on new climate-related compliance requirements?

Monitoring systems:

- Are compliance reports submitted as required?
- Are submissions reviewed substantively or only for completeness?
- Does the government maintain systematic records enabling tracking of compliance over time?

Verification mechanisms:

- Are there processes for verifying self-reported data?
- Do site inspections or audits occur with sufficient frequency?
- Can verification findings be cross-checked against independent data sources?

Coordination across agencies:

- Where multiple agencies have oversight responsibilities, do coordination mechanisms function?
- Are there gaps or duplications in compliance oversight?

Good sources of evidence

Staffing records and organizational charts show whether oversight agencies have the capacity to perform compliance functions. Job descriptions and qualifications reveal whether staff have relevant technical expertise.

Budget documents showing funding for compliance monitoring enable auditors to assess whether oversight systems are adequately resourced. Comparing budgets over time can reveal whether compliance capacity is growing, stable, or declining.

Compliance databases and reporting systems provide direct evidence of whether required reports are being submitted and reviewed. System audit trails show whether compliance officers are actively using systems or whether data sit unexamined.

Inspection logs, site visit reports, and enforcement case files demonstrate whether compliance verification actually occurs in practice.

The monitoring and evaluation frameworks discussed in section 3.11 apply equally to compliance systems—are there clear indicators of system performance, and is that performance actually tracked?

Comparative data from other jurisdictions facing similar compliance challenges provide benchmarks for assessing whether oversight systems are functioning effectively.

What SAIs have found

The Philippine SAI found that while the Climate Change Commission was established by law with broad oversight responsibilities, it lacked technical staff with expertise in key sectors, undermining its ability to verify compliance.

The Estonian SAI found that emissions reporting systems were in place, but regulatory agencies did not have the capacity to verify self-reported data, effectively operating on an honour system.

CESD found that while regulated entities submitted required emissions reports, Environment and Climate Change Canada did not analyse whether reported emissions aligned with emissions reduction trajectories required to meet national targets, meaning that compliance monitoring detected only failure to report, not failure to reduce emissions.

The UK NAO found coordination failures where multiple agencies had overlapping responsibilities for climate compliance but no mechanism for sharing information or ensuring consistent enforcement approaches.

Tanzania's SAI found that monitoring systems existed on paper but were not functioning, required quarterly reports were not being submitted, oversight bodies were not meeting regularly, and compliance data was not being analysed or acted upon.

Pacific SAIs found that small island states often lack the technical capacity to verify complex emissions calculations or assess climate risk models, making them dependent on external verification that may not be available or affordable.

Compliance systems may produce large volumes of data that are never analysed. Auditors examining whether oversight functions properly must look beyond data collection to whether that data inform decisions or trigger responses.

Even where oversight agencies identify non-compliance, they may lack the authority or resources to compel corrective action, particularly when non-compliant entities are other government agencies or politically influential private actors.

Good recommendations from recent reports

- *"The monitoring mechanism in the subsidiaries may be strengthened by streamlining the existing reporting process for maintaining neutrality and to ensure proper checks and balances in the system of compliance mechanism. The oversight role of CIL be directed to ensure compliance to prescribed environmental standards."*
  (India 1)

- *"Make supervision planning more systematic and risk-based; use more data analytics."*
  (Estonia)

7.4 Do entities comply with requirements?

The core question:

Do government entities and regulated actors meet their legal obligations in practice?

Potential questions for audits

Government compliance:

- Have the required climate risk disclosures been published?
- Have mandatory adaptation plans been prepared on schedule?
- Do government procurement and investment decisions comply with climate considerations required by legislation?

Private sector compliance:

- Are regulated entities submitting the required emission reports?
- Do reported emissions comply with caps or reduction requirements?
- Are entities implementing required climate risk management?
- Do new buildings and infrastructure meet climate-related standards?

Accuracy of reporting:

- Can reported data be verified against independent sources?
- Are calculation methodologies applied correctly?
- Have entities understated emissions or overstated reductions?

Quality versus technical compliance:

- Where legislation requires "consideration" of climate, are those considerations substantive or pro forma?
- Do compliance reports contain meaningful analysis or merely check procedural boxes?

Good sources of evidence

Emissions inventories compiled by the government provide national-level compliance data. The UNFCCC reporting framework requires periodic inventory submissions, enabling temporal comparison.

Facility-level emissions reports from regulated entities enable auditors to assess individual compliance. Comparing reported emissions over time can reveal whether reduction trends align with regulatory requirements.

Satellite remote sensing provides independent verification for certain compliance obligations, as discussed in section 3.7. Changes in forest cover, wetland extent, and urban heat islands can be observed independently of official reporting.

Third-party verification reports from technical experts or accredited auditors provide independent assessment of compliance claims.

Budget documents and procurement records show whether government's own operations comply with legislative requirements to incorporate climate considerations.

Climate risk disclosures in financial statements, which are increasingly mandatory under securities regulation or corporate governance codes, enable auditors to assess reporting compliance.

Site inspections and physical verification confirm whether reported compliance reflects reality on the ground.

What SAIs have found

The UK NAO found that the UK government met its first three carbon budgets (2008–2022) but was not on track to meet the fourth carbon budget (2023–2027), representing likely non-compliance with legally binding targets.

The German SAI found that Germany missed the targets set in its 2014 Climate Action Programme, which encompassed 110 cross-sectoral projects.

The Netherlands SAI found that while emissions reporting systems were functioning, actual emissions reductions were substantially lower than those required by legislation, with the gap widening over time.

Estonia's SAI found discrepancies between self-reported emissions and independent estimates, suggesting some entities were understating emissions to avoid compliance costs.

Compliance with procedural requirements often masks non-compliance with substantive obligations. Entities may submit required reports on schedule containing technically accurate data while failing to achieve the emissions reductions or adaptation outcomes that the legislation actually intended.

Determining "compliance" with adaptation requirements is particularly challenging because legislation often requires "adequate" or "appropriate" adaptation without defining those terms, leaving auditors to develop criteria for what constitutes compliance.

Where compliance is costly, entities have incentives to exploit ambiguities in regulatory language or to interpret requirements narrowly. Auditors may find that entities operate in ways that they consider to be technically compliant but that do not contribute to legislative intent.

Good recommendation from a recent report

"Strengthen compliance mechanisms for sectors not meeting emission reduction trajectories, particularly agriculture and transport." (Netherlands 2)

7.5 Are enforcement actions taken when non-compliance is identified?

The core question:

When compliance failures are detected, does the government take appropriate enforcement action?

Potential questions for audits

Enforcement framework:

- What enforcement tools are available, such as warnings, fines, permit revocation, and criminal prosecution?
- Are enforcement powers adequate to compel compliance?
- Do enforcement provisions specify when action is mandatory rather than discretionary?

Enforcement in practice:

- When non-compliance is detected, how frequently does enforcement action follow?
- Are enforcement actions proportionate to violations?
- Are similar violations treated consistently across different entities?

Effectiveness:

- Do enforcement actions result in corrected compliance?
- Are penalties sufficient to deter non-compliance?
- Where the government itself is non-compliant, what accountability mechanisms exist?

Transparency:

- Are enforcement actions publicly disclosed?
- Can affected communities and civil society track whether violations are being addressed?

Good sources of evidence

Enforcement records showing violations identified, actions taken, and outcomes provide direct evidence of whether enforcement occurs. Comparing violation rates with enforcement rates reveals selectivity.

Court records and tribunal decisions show enforcement actions that proceed to formal adjudication.

Penalty receipts in government accounts demonstrate whether fines are actually collected or merely imposed and then waived.

Compliance trends following enforcement actions reveal whether enforcement achieves behavioural change. If violations continue at similar rates despite enforcement, penalties may be too low to deter.

Interviews with regulatory officials, regulated entities, and affected communities provide perspectives on why enforcement does or does not occur.

Media reports and civil society documentation may reveal non-compliance that official records omit.

Comparative analysis of enforcement rates across jurisdictions enables auditors to assess whether national enforcement is typical or unusually lenient or stringent.

What SAIs have found

The Estonian SAI found that while emission limit violations were detected, no penalties had been imposed in five years, effectively signalling that compliance was voluntary.

The UK NAO noted that while the government itself had missed carbon budgets, no accountability mechanism existed for compelling government compliance with its own legislation. The Climate Change Committee could only publish criticism, not impose consequences.

The Netherlands SAI found highly variable enforcement. Some sectors faced regular inspection and penalties for violations, while other sectors with similar non-compliance rates faced no enforcement action, raising questions about fairness and whether enforcement was being influenced by political considerations.

In Canada, the Commissioner of the Environment and Sustainable Development found that weak minimum national standards for large emitters meant that the department had approved less effective provincial carbon pricing programmes, reducing the overall effectiveness of carbon pricing in achieving emission reductions.[18]

Several Pacific SAIs found that climate legislation established penalties for non-compliance, but these were set so low that major emitters preferred to pay the fines rather than reduce emissions. Penalties had become a licensing fee for continued pollution rather than a deterrent.

The Philippine SAI found that enforcement actions were initiated but then dropped during implementation due to political pressure or a lack of legal capacity to see cases through to conclusion.

Governments are often reluctant to enforce climate requirements against public bodies. When ministries miss statutory deadlines or fail to achieve mandated outcomes, they may choose not to apply the enforcement mechanisms that they apply to private sector bodies.

Where enforcement would impose significant economic costs, for example by shutting down major industrial facilities for emissions violations, political pressure may override legal requirements.

Enforcement selectivity may reflect regulatory capture. Well-connected violators may receive lenient treatment, while smaller or politically marginal actors face stringent enforcement for similar violations.

In many jurisdictions, climate enforcement has never been tested in the courts, creating legal uncertainty about whether enforcement provisions are actually enforceable or would be struck down as unconstitutional or exceeding regulatory authority.

18 OAG Canada (2022). *Carbon Pricing*.

Good recommendations from recent reports

- *"Modify Order ARM/1312/2009 contemplating full implementation of information and communication technologies that prevent manipulation and assess, within that modification, the possibility of River Basin Authorities assuming ownership of flow meters. Accompany this modification with reinforcement of River Basin Authorities' inspection plans for water abstractions, providing them with additional economic, human, technical and legal means for this purpose."*
  (Spain 1)

- *"Enhance its governance and regulation for mine rehabilitation by ensuring the Regulator's strategy and risk documents are evidence-based, including by taking into account new and emerging strategic risks, implementing controls to address all risks resulting from a conflict of duties, including ensuring the NSW Resources Regulator uses best practice regulation to meet its rehabilitation objectives under the Mining Act."*
  (Australia 2)

- *"Apply enforcement provisions consistently when emission violations are detected, ensuring penalties are sufficient to deter future non-compliance."*
  (Estonia)

Part 3:

Looking forward

Photo: UNDP Bhutan

CHAPTER 8

LOOKING TO THE FUTURE: ECONOMIC TRANSITION AND FISCAL SUSTAINABILITY

Introduction

Recent audit work by SAIs across all regions indicates that the economic and fiscal implications of the energy transition, particularly those related to revenue sustainability, long-term fiscal planning, contingent liabilities, and policy coherence, are not yet consistently reflected in government medium- and long-term financial frameworks. This chapter examines the intersection of climate change, energy transition, and public financial management, with a focus on how these dynamics affect fiscal sustainability and government preparedness for structural economic change. It is intended to support SAIs in considering the forward-looking fiscal dimensions of climate transition when developing strategic plans and future audit programmes, taking account of their respective national economic structures and fiscal circumstances.

The chapter draws upon specific audits by SAIs and on the INTOSAI Supervisory Committee on Emerging Issues (SCEI) publication, *Navigating Global Trends*, which identifies both climate change and economic transformation as critical emerging trends requiring SAI attention. SCEI notes that the global economy faces "unprecedented levels of public debt. These fiscal pressures create a challenging environment in which governments must simultaneously manage existing obligations while preparing for fundamental economic transformation.

These findings suggest that SAIs can provide valuable insights by assessing fiscal exposure in the context of the energy transition. The energy trilemma and fiscal policy coherence provide useful starting points for SAI assessments of these issues.

8.1 An audit approach to the energy trilemma in the face of evolving technology and energy costs

The energy trilemma, which examines trade-offs between energy security, affordability, and environmental sustainability, has been widely used as a framework for analysing energy policy trade-offs. Earlier formulations implied inherent tension between these objectives, suggesting that decarbonization might compromise either affordability or security. Table 3 maps the energy trilemma to specific fiscal audit questions.

Table 3: Mapping the trilemma to fiscal audit questions

Trilemma intersection	Core audit question	Relevant section
Security vs sustainability	Has government tested whether renewables plus storage provide equivalent or improved energy security compared with continued fossil expansion? Do security claims rely on outdated cost or intermittency assumptions?	8.4
Affordability versus sustainability	Are distributional impacts assessed? Do fossil fuel subsidies protect affordability or create long-term fiscal exposure while delaying lower-cost alternatives?	8.5, 8.6
Security versus affordability	Does new fossil infrastructure lock in future costs that may become uncompetitive? Are stranded asset and decommissioning liabilities reflected in fiscal planning?	8.4
All three	Is there a coherent whole-of-government framework testing energy policy decisions against all three objectives simultaneously using current data?	8.3

Energy markets have evolved substantially over the past decade. The cost of renewable electricity generation and battery storage has declined sharply, while fossil fuel price volatility has exposed risks to both affordability and security associated with import dependence and commodity exposure. For many countries, the three objectives are no longer structurally opposed. They may reinforce one another, depending on the technology mix, system design, and fiscal architecture.

For SAIs, the audit question is not whether trade-offs exist in principle, but whether the trade-offs cited by governments are supported by current evidence and transparently reflected in fiscal projections, investment appraisals, and long-term financial planning.

Examining differential impacts

The fiscal implications of the trilemma differ substantially depending on a country's position in global energy markets. The energy transition will affect countries differently according to their economic structure and position in global energy markets. When developing audit strategies, SAIs should assess their country's specific vulnerabilities and opportunities. Box 8 summarizes some of the common fiscal risks in the energy transition.

SAIs have a critical role in ensuring that government balance sheets and notes to the accounts accurately reflect provisions and contingent liabilities, regardless of which energy sector creates them. Where financial institutions demonstrate asymmetric risk treatment, SAIs should examine whether this creates material misstatements of fiscal exposure.

Box 8: Common risks identified by SAIs in the energy transition

Across adaptation, mitigation, and mixed climate audits, SAIs have identified the following common risks:

- Over-optimistic revenue projections tied to fossil fuel demand
- Insufficient scenario analysis for transition risk
- Under-recognition of decommissioning and remediation liabilities
- Lack of transparent disclosure of fossil fuel subsidies
- Weak alignment between climate commitments and fiscal policy

Institutional asymmetry in risk assessment

Recent research on central bank climate risk management reveals a systematic pattern: financial institutions often "re-risk" renewable energy investments (highlighting their costs and uncertainties) while failing to "de-risk" fossil fuel assets (by assessing stranded asset exposure, decommissioning liabilities, or subsidy dependence). This asymmetry correlates with political context rather than economic risk exposure.[19]

A fiscal sustainability audit needs to assess whether this pattern extends to the government's own financial institutions and fiscal planning:

- Do central bank stress tests examine the cost impacts of renewable energy but not fossil fuel stranded asset risks?
- Are finance ministry cost-benefit analyses asymmetric, requiring detailed justification for renewable energy investments while assuming the viability of fossil fuel projects?
- Are contingent liabilities arising from fossil fuel infrastructure disclosed with the same rigour as renewable energy support mechanisms?

19 Shears, E., Meckling, J., and Finnegan, J. J. (2025). "How Central Banks Manage Climate and Energy Transition Risks". *Nature Energy* 10: 470–478. https://doi.org/10.1038/s41560-025-01724-w

SAIs have a critical role in ensuring that government balance sheets and notes to the accounts accurately reflect provisions and contingent liabilities, regardless of which energy sector creates them. Where financial institutions demonstrate asymmetric risk treatment, SAIs should examine whether this creates material misstatements of fiscal exposure.

Countries without significant fossil fuel production

These countries may benefit from falling energy costs if renewable deployment continues. However, they face transition challenges related to evolving tax bases. Government revenues have historically relied on excise taxes on petroleum products, which are relatively easy to collect and administer. As transport electrifies and renewable energy generates electricity at the point of consumption, traditional fuel taxation becomes less effective. SAIs such Costa Rica's Contraloría General have begun examining whether governments have developed strategies to evolve their revenue base and whether these strategies are realistic.[20]

The Court of Accounts of Morocco, a fossil fuel importing country developing its potential as a renewable energy supplier, has drawn attention to the future challenge of the EU Carbon Border Adjustment Mechanism affecting exports.[21]

Countries with high levels of fossil fuel revenues

For countries where fossil fuel revenues constitute a significant share of government income or export earnings, the energy transition presents fiscal sustainability questions that merit SAIs' attention. Even low-cost producers may face smaller markets if global demand peaks and then declines. SAIs should consider examining whether government revenue projections reflect realistic demand forecasts or are instead based on assumptions of perpetual demand growth. Box 9 provides Norway's example of how long-term fiscal pressures can be assessed.

20 Contraloría General de la República (2021). *Desafíos de la Transición Energética desde la Perspectiva de la Hacienda Pública* [Challenges of Energy Transition from the Public Finance Perspective].

21 Court of Accounts of Morocco (2024). *Annual Report 2023-24.*

Photo: Tran Dinh Hung

Box 9: Norway's example of long-term fiscal sustainability

In its 2024 annual report, Norway's National Audit Office (Riksrevisjonen) analysed the long-term sustainability of state finances, examining how increasing reliance on the government pension fund global (oil fund) affects fiscal resilience as petroleum revenues decline. The analysis suggests that from around 2030, expenditure growth will outpace revenue growth, creating an annual fiscal gap of approximately NKr7 billion (2024 prices) through 2060. While withdrawals from the oil fund have remained within Norway's fiscal rule guideline of 3 percent expected real return, the audit found that exceptional fund performance since the mid-2010s created substantial fiscal space that has been largely utilized, with fund transfers now financing over one-fifth of state budget expenditures, rising to over one-quarter in 2025. The report thus quantifies the fiscal challenges of transitioning away from petroleum dependency.

(Norway 1)

Countries dependent on higher-cost fossil fuel production face particularly acute risks. If global oversupply emerges and prices fall, higher-cost production may become economically unviable. SAIs in such countries that have adopted a foresight role should consider explicitly assessing this risk and examining whether governments are taking preparatory measures. This is particularly relevant for those resource-dependent countries that also carry substantial debt burdens.

The question of economic diversification is urgent in this context. SAIs may assess whether governments have credible diversification strategies and are implementing them at sufficient scale and pace. For countries where fossil fuel revenues exceed 50 percent of government income, diversification is both an environmental imperative and a fiscal necessity.

8.2 How is the energy transition affecting the fiscal outlook?

All SAIs with an emerging issues mandate could consider examining several interconnected fiscal risks (box 10).

Box 10: Finance ministry survey evidence: The gap between concern and analytical integration

A 2024 global survey of 59 ministries of finance worldwide, conducted by the Grantham Research Institute for the Coalition of Finance Ministers for Climate Action, reveals a significant disconnect between stated concern about climate fiscal risks and actual analytical integration into core fiscal processes.

High levels of stated concern:

- 89 percent of the ministries of finance see climate change as a core economic issue, with 32 percent indicating that it is central to their mandate
- 71 percent rate their concern about physical climate impacts on government expenditure at 4 or 5 (on a 5-point scale where 5 is “extremely concerned”)
- 70 percent rate their concern about transition risks on government expenditure at 4 or 5
- 59 percent rate their concern about transition risks on government revenue at 4 or 5

Limited analytical integration:

- Only 35 percent have wholly or partially integrated physical climate considerations into budget projections
- Only 27 percent have integrated physical risks into macroeconomic forecasting
- Only 29 percent have integrated decarbonization or mitigation considerations into budget projections
- Only 26 percent have integrated mitigation into macroeconomic forecasting

Acknowledged capacity constraints:

- 82 percent reported that staffing and skill constraints were barriers to incorporating climate-related issues into economic analysis and modelling approaches
- 78 percent cited data challenges as a barrier

Investment needs assessment:

- Only 26 percent of the ministries of finance have estimated domestic public adaptation costs
- Approximately half have estimated overall domestic expenditure needs for decarbonization in power and transportation sectors
- Only one-third have covered the buildings, industry, and agriculture sectors

These survey results show that even finance ministries expressing specific concern about climate fiscal impacts have not adequately integrated climate considerations into the analytical frameworks that underpin budget projections, macroeconomic forecasts, and fiscal sustainability assessments. This is an issue that impacts the risk assessment of SAIs and increases the potential value of SAI examinations of whether government balance sheets and notes to the accounts reflect climate-related provisions and contingent liabilities.

Source: Coalition of Finance Ministers for Climate Action (2025), Global Survey of Ministries of Finance.

Emerging structural drivers of recurring audit recommendations on economic transition and fiscal sustainability

The relatively small number of SAIs that have so far audited the fiscal dimensions of energy transition have made recommendations that are notably similar, indicating that common structural drivers are at work in many countries (table 4).

A risk that SAIs need to assess is whether finance ministries and central banks consistently underestimate fossil fuel stranded asset risks while giving too much weight to renewable energy transition costs. Research[22] suggests that countries with the largest fossil fuel sectors may have the weakest institutional scrutiny of stranded asset risk.

Table 4: Summary of emerging structural drivers

Structural driver	What is changing	Typical government weakness observed by SAIs	Recurring recommendation themes
Energy system transition	Shift from predictable fossil fuel revenues to variable renewables	Fiscal frameworks assume stable demand and prices	Revenue diversification, long-term fiscal planning, scenario analysis
Delayed policy adjustment	Climate targets advance faster than fiscal reform	Climate commitments not aligned with budgets or subsidies	Policy coherence, subsidy review, climate-proof budgeting
Long asset life cycles	Fossil fuel assets outlast market demand	Lack of life cycle costing and decommissioning provision	Stranded asset risk, contingent liability disclosure
Decentralized implementation	Local delivery of climate actions	Weak coordination and unclear accountability	Governance and coordination, clear roles and mandates
Data-intensive transition	New indicators, markets, and technologies	Inconsistent data and weak tracking systems	Data systems, indicators, monitoring and reporting
Capacity constraints	Rapid policy expansion	Institutions lack expertise and staff	Capacity building, institutional strengthening
Fiscal constraint context	High debt and competing demands	Climate spending crowded out or misallocated	Prioritization, performance-based funding

22 Shears, E., Meckling, J., and Finnegan, J. J. (2025). "How Central Banks Manage Climate and Energy Transition Risks". *Nature Energy* 10: 470–478. https://doi.org/10.1038/s41560-025-01724-w

Audit findings from energy transition work provide some examples supporting these academic conclusions:

- Brazil's TCU quantified energy subsidies across all sources, identifying R$79.88 billion in fossil fuel subsidies versus R$22.76 billion for renewables, ration of 4:1, and examined whether the 62 percent allocation of the New Growth Acceleration Program (PAC), an energy investment programme, to fossil fuels aligned with stated climate objectives. The French Cour des Comptes provides a second example of forward-looking analysis. France is the European Union's leading biodiesel producer, with the sector utilizing 3.6 percent of agricultural land and receiving approximately €300 million annually in tax expenditures. In its 2021 evaluation of biofuel policy, the Cour des Comptes made four recommendations to refine technical implementation and a fifth asking government to "define a transition strategy to clarify the long-term evolution of conventional biofuels on one hand, and advanced biofuels on the other", given France's planned 2040 phase-out of new thermal vehicles. This distinction, between optimizing current policy and questioning its strategic coherence in the context of structural change, represents the kind of forward-looking fiscal risk assessment advocated in this chapter.
- Indonesia's Audit Board (BPK) also conducted sophisticated energy transition audits using a six-step strategic foresight framework, although this was applied only to renewable energy costs and imports.

These examples show that SAIs are well able to apply methodologically sophisticated approaches. Good practice in this area is to examine whether government fiscal projections reflect comparable rigour in assessing risks across all energy types, or whether certain risks receive disproportionate attention because of political economy considerations rather than materiality (table 5).

Table 5: Fiscal risk areas and possible audit questions

Fiscal risk area	Possible audit questions
Revenue transition	Are replacement tax mechanisms credible and funded? Has the government quantified the fiscal gap from declining fuel excise?
Stranded assets	Are life cycle costs fully disclosed and provisioned? Are State Owned Enterprise balance sheets stress-tested against low-demand scenarios?
Decommissioning	Are financial assurances adequate under early closure scenarios?
Policy coherence	Do subsidies, public investment, and incentives align with stated fiscal and climate goals?
Analytical capacity	Has the finance ministry actually integrated climate risks into budget projections and macroeconomic forecasting, or does stated concern exceed analytical implementation?
Tax expenditures	Are fossil fuel tax preferences quantified and regularly reviewed? Do they undermine carbon pricing?

8.3 Fiscal policy coherence in the energy transition

Fiscal policy coherence refers to the internal consistency of taxation, subsidies, public investment, contingent liability management, and macro-fiscal planning in relation to stated energy and climate objectives. Incoherence arises where fiscal instruments operate at cross-purposes, for example, where subsidy regimes undermine decarbonization goals, where tax expenditures favour carbon-intensive activities, or where long-term liabilities are omitted from investment decisions.

A government can be technically compliant with every individual programme rule, can administer its carbon pricing mechanism correctly, and can disburse its renewable energy subsidies as legislated, while its overall fiscal stance remains a net subsidy to emissions. This is the central question that a coherence audit is designed to surface, and a sequential examination of climate-related instruments is not sufficient to answer it. Addressing this requires an SAI to develop a cross-cutting assessment.

For SAIs, assessing coherence does not require evaluating policy ambition. It involves testing whether fiscal instruments align with stated objectives and whether trade-offs are transparently disclosed (box 11).

Box 11: Audit questions for fiscal policy coherence

- Most governments deploy combinations of fuel excise duties, carbon pricing mechanisms, environmental levies, and tax expenditures that materially affect the economics of the transition. SAIs examining tax policy can assess whether these instruments operate coherently. For example, audit work has identified cases where the introduction of carbon pricing was accompanied by reductions in fuel excise, effectively neutralizing the intended price signal. Such contradictions are auditable using established tax expenditure and revenue analysis methodologies.

- Where governments apply detailed stress testing to renewable energy costs while assuming continued demand and stable revenues for fossil fuel assets, fiscal risk may be materially understated. In resource-dependent economies, such asymmetry can have significant implications for sovereign creditworthiness, intergenerational equity, and the credibility of fiscal sustainability frameworks.

- In some cases, transition support mechanisms may transfer costs that would otherwise have been borne by firms or sectoral actors to the public budget. Where such measures are introduced in advance of definitive sectoral contraction, they may operate in practice as risk-sharing or support mechanisms for the affected industry. SAIs may therefore assess whether these fiscal effects are explicitly recognized, appropriately classified, and consistent with broader fiscal policy objectives.

When scoping audits, SAIs may benefit from surveying the full landscape of fiscal instruments affecting energy outcomes. Diagnostic tools such as the PEFA Climate module, where available, can help identify alignment gaps within public financial management systems. International datasets on fossil fuel support and tax expenditures can also support benchmarking. While such tools do not constitute audit evidence, they can inform topic selection and risk assessment.

8.4 Decommissioning costs and long-term liabilities

As countries transition away from fossil fuels, multiple fiscal risks emerge. Infrastructure may become economically unviable before its planned end of life if demand declines or renewables gain market share from fossil fuels. Decommissioning costs for mines, oil wells, and associated infrastructure create liabilities that typically materialize decades after initial investment decisions, often outliving the companies that created them.

Audit work across multiple jurisdictions identifies a recurring pattern: approval and financing decisions for fossil fuel and extractive projects often lack full life cycle costing, including decommissioning under both planned end of life and premature closure scenarios. This creates contingent liabilities that are not transparently disclosed in public accounts.

The scale can be substantial. The UK NAO reported North Sea oil and gas decommissioning costs of £59.7 billion, with £24 billion in tax relief expected to flow to operators. In New South Wales, Australia, inadequate mining bonds have created an estimated taxpayer liability of AUD $20 billion to $50 billion for abandoned mine sites. The New South Wales Audit Office found that security deposits had increased by 30 percent, yet shortfalls persisted, with no financial assurance for post-closure environmental risks.

Where state-owned enterprises hold significant fossil fuel assets, financial audit of the balance sheet should examine whether book values reflect realistic demand scenarios or assume indefinite market viability. The absence of scenario analysis for fossil fuel assets in contexts where it is required for renewable energy investments represents an asymmetry that may materially misstate government balance sheet exposure.

Audit questions for decommissioning and long-term liabilities

SAIs should consider:

- Whether current and future decommissioning costs are adequately funded by enterprises
- Whether they represent contingent liabilities that should be disclosed in notes to the accounts
- Whether they meet the criteria to be recorded as provisions in public sector accounts
- For new fossil fuel projects, whether approval processes require full life cycle cost disclosure, including decommissioning under both planned end of life and premature closure scenarios
- Whether financial assurance, such as bonds and guarantees, is required and set at levels that reflect full costs, including under early closure scenarios

8.5 Taxation and revenue architecture

Historically, fossil fuels have provided governments with reliable tax revenue through fuel excise duties and extraction royalties. The transition to renewable energy, particularly distributed generation such as rooftop solar, creates electricity supply that fall outside traditional taxation systems (table 6).

SAI examples include the following:

- Costa Rica's Contraloría General examined the fiscal impact of electrification in its 2021 report, *Desafíos de la transición energética desde la perspectiva de la Hacienda Pública*. As petroleum consumption declines, traditional excise-based revenues are projected to shrink, highlighting the need for forward-looking fiscal planning, scenario analysis, and coordination across government agencies to manage the transition effectively.
- Audit work also suggests a risk that governments may focus disproportionately on intermediate or politically entrenched renewables, such as biofuels, which can divert resources from more transformative technologies and complicate long-term fiscal planning. France's Cour des Comptes highlighted this in its 2021 evaluation of biofuel policy, recommending a clearer strategy to align current support with the planned structural transition to low-carbon energy.

Mitigation-focused audits in the energy and transport sectors increasingly highlight a disconnect between decarbonization targets and revenue system reform, with limited progress on replacing diminishing fuel-based taxation.

8.6 Fossil fuel subsidies and tax expenditures in the context of fiscal constraint

Some SAIs have found that fossil fuel subsidies and tax expenditures are not consistently quantified, disclosed, or assessed against climate and fiscal objectives, limiting legislatures' ability to evaluate trade-offs.

The SCEI documents governments facing pressure to balance competing priorities with constrained resources and high levels of accumulated debt. In this context, fossil fuel subsidies represent opportunity costs that merit examination. Many countries simultaneously subsidize fossil fuel consumption or production while facing fiscal constraints on climate adaptation and mitigation spending.

Key distinctions

- **Explicit subsidies:** Direct budget outlays, below-market pricing of state-owned resources, transfers to consumers or producers
- **Implicit subsidies:** Tax expenditures (including preferential rates, exemptions, and deductions), under-pricing of environmental damages, and assumption of decommissioning liabilities

Table 6: Revenue transition risks

Revenue source	Transition risk	Audit questions
Fuel excise	Declines with electrification	Has the government quantified the projected decline? Are replacement mechanisms under development?
Extraction royalties	Declines with reduced production	Are royalty rates set to capture value while not accelerating extraction? Are fiscal regimes adaptable to price changes?
Carbon tax or base	May expand or contract depending on coverage	Is carbon tax coverage expanding or contracting? Are exemptions being reviewed?
Tax expenditures	May lock in fossil fuel support	Are fossil fuel tax preferences being phased out? Are they reviewed against climate objectives?

- **Foregone revenue:** Often larger than explicit subsidies but less visible in budget documents

SAIs should consider examining the quantification of explicit fossil fuel subsidies in government budgets, implicit subsidies through preferential tax treatment or below-market pricing, and whether subsidy reform has been considered as a mechanism for freeing resources for climate action. Where the state will fund future decommissioning and transition costs, these represent fossil fuel subsidies that should be disclosed in climate-sensitive public financial management frameworks.

8.7 Compliance audit entry points for climate fiscal risks

The preceding sections address revenue transition, decommissioning liabilities, and fiscal coherence primarily as fiscal planning and sustainability challenges, questions typically examined through performance audit. However, climate-related fiscal risks create equally significant compliance audit opportunities that many SAIs may overlook.

A critical distinction exists between assessing whether the government has developed adequate transition strategies (performance audit) and verifying whether climate-relevant fiscal instruments already on the statute books are being administered and enforced as legislated (compliance audit). The latter requires no performance audit mandate and no specialist climate expertise. It requires SAIs to apply standard revenue audit and financial compliance methodologies to climate-relevant instruments.

Three compliance audit entry points are directly relevant to the energy transition and accessible to SAIs with traditional financial and regularity audit mandates: (1) tax expenditure review and climate -consistency screening; (2) environmental fee and levy enforcement; (3) carbon-pricing revenue compliance.

1. Tax expenditure review and climate consistency screening

Fossil fuel tax preferences, including accelerated depreciation for extractive assets, reduced royalty rates, preferential excise treatment, and value-added tax exemptions on fuel inputs, represent foregone revenue functioning as implicit subsidies. In most countries these concessions are not subject to annual parliamentary review and have never been assessed against current climate commitments.

SAIs can audit whether:

- A systematic tax expenditure review process exists and operates as intended
- Fossil fuel tax concessions are quantified and reported with the same transparency as direct budget outlays
- These concessions have been screened for consistency with stated climate objectives
- Tax expenditure statements distinguish between concessions supporting versus contradicting climate policy

This requires no specialist climate expertise. It is a standard fiscal governance question about whether tax expenditures are identified, quantified, regularly reviewed, and assessed against government policy objectives. Where such reviews have never occurred or systematically exclude fossil fuel preferences, this represents a compliance gap in fiscal transparency requirements.

2. Environmental fee and levy enforcement

Many environmental levies, pollution fees, water abstraction charges, and emission-related fees are nominally in force but weakly administered. Collection rates often fall far below assessed liabilities. Penalties for non-compliance may rarely be applied, and enforcement capacity may not have kept pace with the introduction of new instruments.

SAIs can examine:

- Collection rates against assessed liabilities for environmental fees and charges
- Whether penalties prescribed by legislation are actually applied when non-compliance is identified
- Whether enforcement capacity and resourcing match the number and complexity of instruments in force
- Whether fee levels are periodically reviewed and adjusted as required by enabling legislation

The Cyprus irrigation water case discussed in this guide, with 27.6 percent cost recovery while aquifers are over-extracted in 14 of 22 groundwater bodies, illustrates the fiscal and environmental cost of enforcement failure. The legislative instrument existed, the fees were set, and the collection and enforcement mechanisms failed. This is auditable using standard compliance audit methodology to examine whether administrative agencies implement legislated requirements effectively.

3. Carbon pricing revenue compliance

Where carbon taxes or emissions trading schemes exist, the fiscal instrument creates compliance audit opportunities parallel to those in any revenue system.

SAIs can examine whether:

- Liable entities correctly report emissions and remit required payments
- The tax base is being eroded through exemptions, reclassifications, or definitional changes not authorized by legislation
- Revenue collected is allocated and used as specified in budget documentation and enabling legislation
- Administrative processes follow prescribed procedures for assessment, collection, and enforcement

These are standard revenue compliance questions applied to a climate-relevant instrument. Where carbon pricing exists in law but collection rates are low, enforcement is weak, or revenue use diverges from legislative intent, this creates both fiscal and climate policy consequences.

While these compliance approaches remain relatively underutilized in climate audit practice globally, the examples that exist demonstrate their value. Estonia's environmental fees audit revealed systematic under-pricing and weak enforcement. Cyprus's irrigation water cost recovery assessment, with 27.6 percent recovery while aquifers were over-extracted, illustrated how enforcement failure creates both fiscal and environmental costs. Brazil's quantification of fossil fuel versus renewable subsidies, though conducted as a performance audit, demonstrated the materiality of tax expenditure analysis in a climate context. The relative scarcity of such audits reflects both the recent development of climate audit practice, which has focused primarily on performance assessment, and broader weaknesses in tax expenditure review systems globally. However, as climate-relevant fiscal instruments proliferate and fiscal pressures intensify, systematic compliance audit of these instruments becomes increasingly important.

Significance for SAI audit planning

These entry points do not require a performance audit mandate or specialist climate expertise. They require a financial audit or regularity audit mandate, which most SAIs hold, applied to instruments that are on the statute books but inconsistently enforced or inadequately reviewed.

The largest and most immediately auditable climate fiscal inconsistencies frequently arise not from the absence of forward-looking transition strategies, which performance audits can assess, but from the failure to enforce, review, or transparently report on fiscal instruments already in place.

For SAIs developing climate audit programmes, these compliance entry points offer several advantages:

- **Accessibility:** No specialist climate expertise required, and standard audit methodologies apply
- **Mandate certainty:** They fall within traditional financial and regularity audit mandates
- **Immediate materiality:** Tax expenditures and environmental fees often represent significant fiscal amounts
- **Policy relevance:** Enforcement failures and unreported tax preferences directly undermine stated climate objectives
- **Auditability:** Documentary evidence, financial records, and administrative files provide a verifiable audit trail

SAIs that have not yet conducted climate-focused performance audits can build institutional capability and add value through compliance work on climate-relevant fiscal instruments. The evidence gathered and patterns identified often reveal systemic issues warranting performance audit examination.

8.8 Strategic questions for SAIs

When developing forward-looking audit strategies on economic transition and fiscal sustainability, SAIs may consider the following questions, adapted to their national context.

1. Assumptions, projections, and scenario use

- Do government fiscal projections and macroeconomic forecasts incorporate realistic and transparent assumptions about future energy markets, or do they assume static demand, prices, or production profiles?
- Has the government tested the sensitivity of key fiscal aggregates, including revenues, expenditures, and debt trajectories, to alternative energy transition scenarios, and are assumptions used consistently across policies, budgets, and long-term plans?

2. Revenue transition and tax system adaptation

- For countries reliant on fuel excise, royalties, or hydrocarbon revenues, are credible, timely, and funded strategies in place to diversify revenue sources and replace declining revenues as the energy system evolves?
- Are proposed revenue transition measures, such as road-user charging, electricity taxation, and carbon pricing, realistic given administrative capacity, political constraints, and equity considerations?
- Are tax expenditures for fossil fuels quantified, regularly reviewed, and assessed against climate objectives?

3. Assets, liabilities, and balance sheet exposure

- Have governments identified and evaluated contingent liabilities arising from fossil fuel infrastructure, including decommissioning, remediation, and premature closure risks, and are state-owned enterprise balance sheets assessed for stranded asset exposure?
- Do approval and investment processes:
  - require full life cycle cost disclosure for major energy and extractive projects?
  - include assessment under early closure or low-demand scenarios?
  - assume demand patterns will continue indefinitely?

4. Policy coherence and use of public resources

- Are climate commitments, energy policies, subsidies, and public investment plans internally consistent, or do fiscal measures undermine stated climate and economic objectives?
- Are fossil fuel subsidies and tax expenditures, both explicit and implicit, quantified, transparently reported, and assessed against alternative uses of public resources under conditions of fiscal constraint?
- When the full suite of taxation, tax expenditures, subsidies, public investment decisions, and contingent liability exposures is examined together, does the government's aggregate fiscal stance provide a net incentive to decarbonize or does it continue to provide a net subsidy to fossil fuel dependence?
- Has the finance ministry ever produced a consolidated assessment of the government's net climate fiscal position?

5. Institutional capacity and symmetry in risk assessment

- Has the finance ministry integrated climate-related risks into budget projections, macroeconomic forecasting, and fiscal sustainability analysis, or does stated concern exceed analytical implementation?
- Do central banks, finance ministries, and public financial institutions apply symmetric risk assessment to fossil fuel and renewable energy investments, or is there systematic bias that may misstate fiscal exposure?

8.9 Specific considerations for countries dependent on resource revenues

SAIs operating in countries heavily dependent on fossil fuel revenues face particular challenges. SCEI warns that "strain on public resources could limit the resources available to SAIs, posing risks to independence and effectiveness". Despite these pressures, SAIs in resource-dependent countries have a critical role in warning policymakers of fiscal risks (box 12).

Box 12: Specific considerations for fossil fuel revenue-dependent countries

- **Revenue concentration:** If a single commodity provides the majority of government revenue, fiscal sustainability depends on managing transition risk. SAIs can examine whether diversification strategies are credible and adequately resourced.
- **Debt sustainability:** If debt service depends on specific commodity prices or export volumes, scenario analysis of potential revenue decline becomes essential. SAIs can examine whether debt sustainability analyses incorporate transition scenarios.
- **Intergenerational equity:** Are current generations consuming resource wealth without investing in assets (physical, human, or financial) that will sustain future generations? SAIs can examine whether resource revenues are being converted into durable public value.
- **Institutional capture:** Research suggests countries with the largest fossil fuel sectors may have the least institutional scrutiny of transition risks. SAIs should examine whether risk assessment frameworks, including those of central banks and finance ministries, accurately reflect material fiscal exposures.

SAIs in resource-dependent contexts should consider their role not only in auditing government implementation of existing policies but also in examining whether institutional risk assessment frameworks themselves (including those of central banks and finance ministries) accurately reflect material fiscal exposures. Ensuring that government balance sheets recognize provisions and contingent liabilities for fossil fuel infrastructure with the same rigour applied to renewable energy support represents a fundamental element of fiscal transparency and intergenerational equity.

SCEI emphasizes that SAIs must "ensure that public resources are managed responsibly to safeguard economic prosperity, health, and well-being for current and future generations". For resource-dependent countries, this explicitly includes assessing whether current fiscal strategies are sustainable or whether they assume permanent resource revenues that may prove unsustainable. If a country's debt service depends on specific commodity prices or export volumes, a scenario analysis of potential revenue decline becomes essential.

8.10 Conclusion

The economic dimensions of climate change and energy transition represent significant fiscal challenges that many governments will face in the coming decades. The audit evidence reviewed in this chapter suggests that the principal challenge for fiscal sustainability is not uncertainty itself, but the assumptions used to manage it. In many countries, government fiscal projections continue to rely on energy market and revenue assumptions that have not been rigorously re-examined in light of evolving transition dynamics.

The pace of technological change in energy markets means that cost assumptions embedded in long-lived infrastructure decisions may become outdated well within the operational lifetime of the assets concerned. Deployment decisions need to accommodate this uncertainty. Fiscal frameworks that lock in commitments on the basis of current costs, whether for fossil fuel or renewable infrastructure, without mechanisms for periodic reassessment, create avoidable fiscal risk.

The fiscal coherence themes running throughout this guide, including tax expenditure review, subsidy quantification, life cycle costing, and long-term liability disclosure, provide auditors with tools to examine how governments are managing these risks.

For SAIs, understanding these dynamics is important for fulfilling mandates to promote accountability, transparency, and sound public financial management. A constructive role for SAIs is therefore to examine whether the assumptions underpinning fiscal forecasts, investment appraisals, and long-term planning remain valid, internally consistent, and transparently documented. This does not require SAIs to predict future energy outcomes but rather to assess whether governments have subjected the key assumptions to appropriate scrutiny.

In this context, dialogue with external experts, such as energy economists, fiscal modelling specialists, and academic institutions, can support both governments and SAIs in testing the robustness of assumptions used in public financial frameworks.

Glossary and annexes

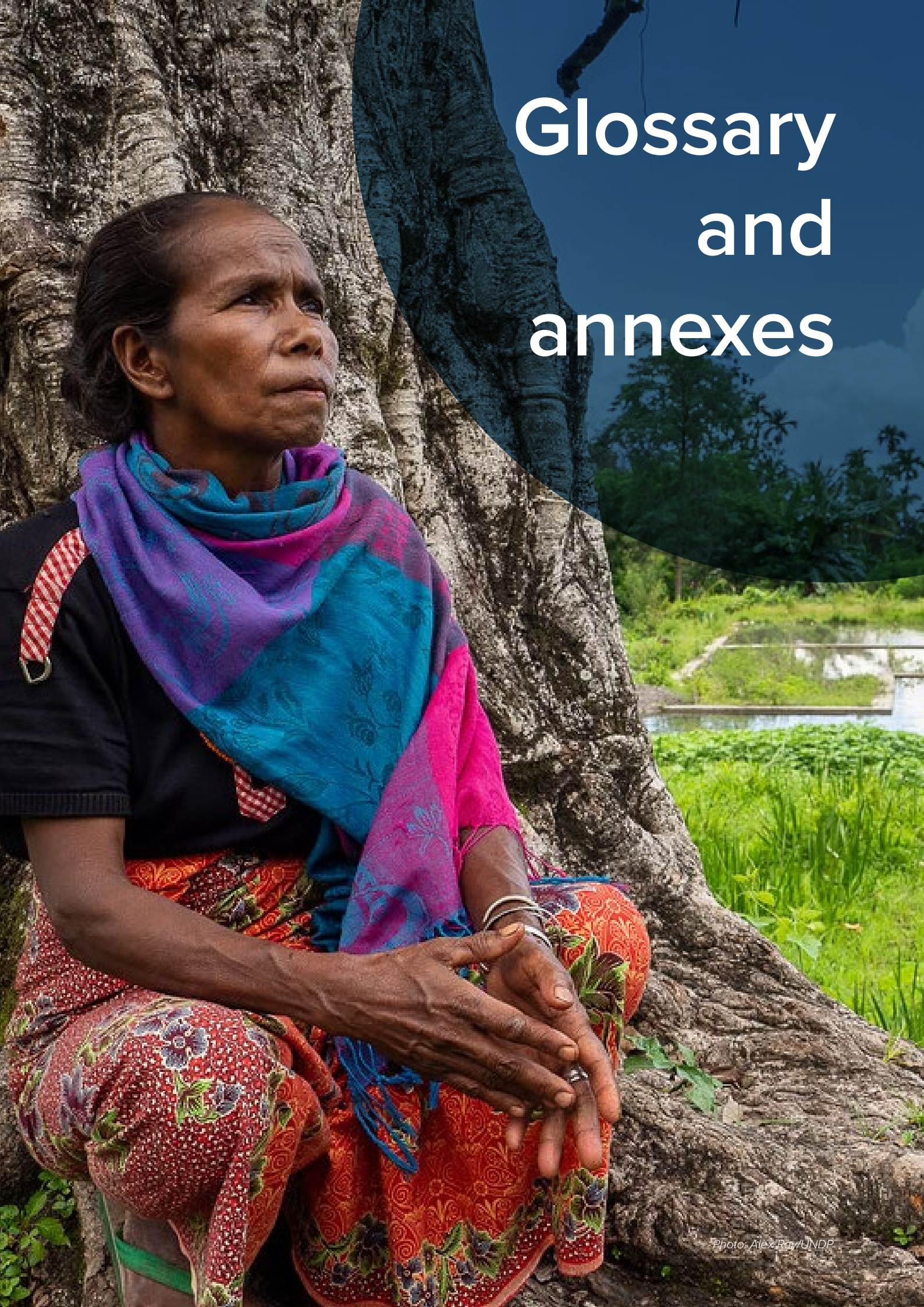


Photo: Alex Ray/UNDP

GLOSSARY:

KEY TERMS AND DEFINITIONS

This section introduces essential concepts for climate audit work. Further definitions are provided in annex A.

Core audit concepts

Audit criteria: Benchmarks used to evaluate the subject matter, including laws, regulations, performance targets, expert opinions, or established principles and best practices.

Compliance audit: An audit engagement designed to provide assurance on whether a subject matter complies in all material respects with applicable authorities identified as criteria.

Financial audit: An audit of the financial information of an entity to express an opinion on whether the financial statements are prepared in accordance with applicable financial reporting and regulatory frameworks.

Materiality: The significance of an omission or misstatement of information that makes it probable that the judgment of a reasonable person relying on the information would have been changed or influenced.

Performance audit: An independent examination of the efficiency, effectiveness, and economy of government undertakings, activities, or programmes, including assessment of whether objectives have been achieved and value for money obtained.

Climate-specific audit terms

Climate change adaptation: The process of adjustment to actual or expected climate change and its effects, moderating harm or exploiting beneficial opportunities. This includes adjustments in ecological, social, or economic systems in response to actual or expected climatic stimuli and their effects.

Climate change mitigation: Human intervention to reduce GHG emissions or enhance sinks that remove GHGs from the atmosphere.

Climate expenditure review: An evaluation of the patterns of climate expenditure, ideally, though not necessarily, including an evaluation of the expected outcomes of the expenditure.

Climate finance: Local, national, or transnational financing from public, private, or alternative sources that seeks to support mitigation and adaptation actions to address climate change.

Climate impact assessment: An analysis of the mitigation or adaptation outcomes that can be expected to be achieved if expenditure proceeds as planned. Ideally, this includes an assessment of the factors that could prevent the expected outcomes from being achieved and whether these factors can be managed.

Climate-sensitive public financial management (PFM): Any PFM activities that contribute to a country's pursuit of mitigation and/or adaptation objectives. This may cover all stages of the budget cycle, as well as other climate policy and PFM interfaces that help to raise and manage climate public finance and incentivize climate action.

Green budget tagging: A process for identifying and tracking climate-relevant expenditures within government budgets to assess climate finance flows. Also known as climate budget tagging (CBT).

Nationally Determined Contributions (NDCs): Climate action plans submitted by countries under the Paris Agreement outlining efforts to reduce national emissions and adapt to climate impacts.

Greenhouse gas and measurement terms

Carbon footprint: The total amount of greenhouse gas emissions caused directly and indirectly by an individual, organization, event, or product.

Carbon neutrality/net zero: Achieving a balance between greenhouse gas emissions produced and emissions removed from the atmosphere, resulting in net-zero emissions.

Effectiveness: The extent to which expected results are achieved. This may apply both to effectiveness in increasing climate expenditure and to the effectiveness of that expenditure in delivering mitigation and adaptation outcomes.

Emission factor: A coefficient that quantifies the emissions or removals of a gas per unit of activity, used in calculating greenhouse gas inventories.

Greenhouse gas (GHG) inventory: A comprehensive accounting of all GHG emissions and removals from specified sources and sinks within defined boundaries.

Key performance indicators: Selected indicators that capture the outputs, outcomes, and impact of expenditure and can be used for monitoring and evaluating whether actual results meet targets.

Scope 1, 2, and 3 emissions: Classification of emissions as direct (Scope 1), indirect from purchased energy (Scope 2), or other indirect emissions in the value chain (Scope 3).

International framework terms

Climate risk assessment: A systematic process of identifying, analysing, and evaluating the potential adverse impacts of climate change on assets, operations, or populations.

National Adaptation Plans (NAPs): Processes established under the UNFCCC to identify medium- and long-term adaptation needs and develop strategies to address them. Since COP 17, they have been intended to reduce vulnerability to the impacts of climate change by building adaptive capacity and resilience, and to facilitate the integration of climate change adaptation into relevant new and existing policies, programmes, and activities, particularly development planning processes and strategies, within all relevant sectors and at different levels, as appropriate.

Nationally Appropriate Mitigation Actions (NAMAs): Policy actions undertaken by developing countries to reduce emissions relative to business-as-usual trajectories.

Paris Agreement: An international treaty on climate change adopted in 2015, aiming to limit global warming to well below 2°C, and preferably 1.5°C, compared with pre-industrial levels.

UNFCCC: The United Nations Framework Convention on Climate Change, the international environmental treaty addressing climate change, established in 1992.

INTOSAI framework terms

GUID 5340: An INTOSAI guidance document on auditing climate change, providing frameworks and methodologies for SAIs conducting climate audits.

International Standards of Supreme Audit Institutions (ISSAIs): Professional standards developed by INTOSAI that establish fundamental auditing principles and good practices.

INTOSAI Framework of Professional Pronouncements (IFPP): The comprehensive framework containing INTOSAI's standards, guidance, and principles for public sector auditing.

INTOSAI Working Group on Environmental Auditing (WGEA): The INTOSAI working group focused on sharing knowledge and promoting environmental audit practices among SAIs.

Supreme Audit Institution (SAI): The public body of a state that exercises the highest public auditing function according to procedures determined by law.

Audit methodology terms

Audit evidence: Information used by the auditor to support findings, conclusions, and recommendations, which must be sufficient, appropriate, and reliable.

Audit objective: A precise statement defining what the audit intends to accomplish and what questions it seeks to answer regarding the audited entity or programme.

Audit recommendations: Suggestions for action by the audited entity to address identified deficiencies, improve performance, or enhance compliance with climate commitments.

Audit scope: The extent of the audit in terms of subject matter, time, locations, and organizational units to be covered.

Impact evaluation: Assessment of changes in outcomes that can be attributed to a specific intervention, establishing causality between the intervention and the observed results.

Root cause analysis: A systematic process for identifying the fundamental underlying factors that caused observed problems or deficiencies in climate policy implementation.

Theory of change: A comprehensive description explaining how and why a desired change is expected to happen, linking activities to intermediate and final outcomes.

Three Es (economy, efficiency, and effectiveness): Core dimensions of performance audit examining whether resources are acquired economically, used efficiently, and achieve intended effectiveness.

Quality assurance: Systematic processes and procedures within the SAI to ensure that audits meet professional standards and provide reliable, credible findings.

Stakeholder engagement: The process of involving individuals, groups, or organizations who may affect, be affected by, or perceive themselves to be affected by the audit or audited activities.

Climate policy and governance terms

Climate governance: The mechanisms, processes, and institutions through which climate change policies are formulated, implemented, monitored, and enforced.

Climate mainstreaming: The integration of climate change considerations into development policies, programmes, and practices across all sectors and levels.

Climate policy coherence: The consistency and coordination of climate policies across sectors, levels of government, and with other policy objectives to avoid contradictions.

Ex ante classification: Classification carried out sufficiently early in the budget process to influence budget preparation and negotiation.

Ex post budget classification: Classification carried out after the budget is agreed.

Just transition: A framework for shifting to a low-carbon economy in ways that are fair and inclusive, creating decent work opportunities while leaving no one behind.

Monitoring, reporting, and verification (MRV): A system for tracking, documenting, and independently verifying climate actions, emissions reductions, and financial flows.

Technical and assessment tools

Additionality: The principle that climate finance or project benefits must be beyond what would have occurred without the intervention, demonstrating genuine additional impact.

Climate co-benefits: Additional positive outcomes beyond the primary climate objective, such as improved air quality, health benefits, or job creation arising from climate actions.

Climate resilience: The capacity of systems, communities, or organizations to anticipate, prepare for, respond to, and recover from climate-related hazards while adapting and transforming towards sustainability.

ClimateScanner: An INTOSAI WGEA tool enabling SAIs to review climate commitments, policies, and implementation across their jurisdictions using a standard framework (see section 2.1).

Vulnerability assessment: The process of identifying, quantifying, and prioritizing vulnerabilities of systems, populations, or assets to climate change impacts.

Advanced policy and finance terms

Blended finance: The strategic use of development finance and philanthropic funds to mobilize private capital flows to emerging and frontier markets for climate and sustainable development.

Climate budget tagging: A systematic methodology for identifying, tracking, and assessing climate-related expenditures within government budgets using standardized markers or coefficients.

Climate fiscal risk: The potential impact of climate change and climate policies on public finances, including physical damage costs, transition costs, and stranded asset exposure.

Green bond: A fixed-income instrument specifically designated to raise money for climate and environmental projects, requiring transparent reporting on use of proceeds.

Loss and damage: The actual or potential manifestation of impacts associated with climate change in developing countries that cannot be averted by adaptation and mitigation actions.

Measurement and reporting standards

Benchmark scenario: A reference case or business-as-usual projection against which the impact of climate policies or interventions is measured.

Carbon intensity: The amount of greenhouse gas emissions per unit of output, activity, or economic value (e.g. tonnes of CO_2 per unit of GDP or per kilometre travelled).

GHG Protocol: A comprehensive global standardized framework for measuring and managing greenhouse gas emissions from private and public sector operations, value chains, and mitigation actions.

Life cycle assessment (LCA): A methodology for assessing environmental impacts associated with all stages of the life of a product, process, or service, from raw material extraction through to disposal.

Transparency framework: An enhanced framework under the Paris Agreement requiring countries to regularly report on emissions, progress towards Nationally Determined Contributions, and climate support provided or received.

Sectoral and technical terms

Circular economy: An economic system aimed at eliminating waste and ensuring the continual use of resources through design, maintenance, reuse, remanufacturing, refurbishing, and recycling.

Energy efficiency: Using less energy to provide the same service or output, reducing waste and often providing economic and environmental benefits.

Nature-based solutions: Actions to protect, sustainably manage, and restore natural or modified ecosystems that address societal challenges while providing human well-being and biodiversity benefits.

Renewable energy: Energy derived from natural processes that are replenished constantly, including solar, wind, hydroelectric, geothermal, and sustainable biomass.

Stranded assets: Assets that have suffered from unanticipated or premature write-downs, devaluations, or conversion to liabilities due to changes in climate policy, technology, or market conditions.

Note: These definitions are drawn from international frameworks, including the UNFCCC, the Paris Agreement, and INTOSAI, from academic literature on organizational theory and public administration, and from established audit practice. SAIs should interpret these terms in accordance with their national legal frameworks and mandates while recognizing the value of common international terminology for comparative analysis and peer learning.

ANNEX A

GLOBAL BENCHMARKS AND TOOLS FOR SAIS

This annex provides a comprehensive guide to authoritative global benchmarks, databases, tools, and frameworks that SAIs can use when conducting climate audits. These resources enable SAIs to situate national climate action in an international context, compare performance against peer countries, access standardized methodologies, and ground audit findings in credible external data.

A.1. Climate risk and vulnerability indices

Notre Dame Global Adaptation Initiative (ND-GAIN)

ND-GAIN provides vulnerability and readiness scores for countries, summarizing a country's vulnerability to climate change and capacity to improve resilience. The index combines 45 indicators to create vulnerability scores (exposure, sensitivity, and adaptive capacity across six sectors: food, water, health, ecosystem services, human habitat, and infrastructure) and readiness scores (economic, governance, and social readiness).

Key features:

- Graphical presentation showing countries positioned by vulnerability (vertical axis) and readiness (horizontal axis)
- Annual updates enabling trend analysis over time
- Sector-specific vulnerability breakdowns
- Freely accessible at https://gain.nd.edu/

Audit applications: Benchmark national vulnerability against peers; identify priority sectors for adaptation; assess whether adaptation investment aligns with vulnerability profile; track changes in readiness over time.

Global Climate Risk Index (CRI)

Published annually by Germanwatch, the CRI analyses to what extent countries have been affected by impacts of weather-related loss events (storms, floods, heat waves, etc.). It ranks countries based on fatalities, fatalities per 100,000 inhabitants, absolute losses in purchasing power parity, and losses per unit of GDP.

Key features:

- Rankings for single years and 20-year averages
- Quantified impacts in terms of deaths and economic losses
- Specific identification of most affected countries
- Available at https://www.germanwatch.org/en/cri

Audit applications: Situate national climate impacts in an international context (as done by the Philippines' Commission on Audit); justify urgency of adaptation investments; compare economic impacts across countries; identify disproportionate impacts on specific countries.

Climate Change Performance Index (CCPI)

The CCPI evaluates and compares the climate protection performance of 63 countries plus the European Union, covering over 90 percent of global greenhouse gas emissions. Published annually by Germanwatch, NewClimate Institute, and Climate Action Network, it assesses performance in four categories: GHG emissions (40 percent), renewable energy (20 percent), energy use (20 percent), and climate policy (20 percent).

Key features:

- Overall rankings and category-specific scores
- Trend assessments (improving, moderate, or poor performance)
- Standardized methodology enabling year-on-year comparison
- Available at https://ccpi.org/

Audit applications: Benchmark national mitigation performance internationally; identify strong and weak performance areas; track performance trends over time; support recommendations for policy improvement.

A.2. Policy and finance tracking tools

OECD Effective Carbon Rates Database

The OECD Effective Carbon Rates database provides detailed data on carbon pricing across 71 countries representing 80 percent of global emissions. It combines explicit carbon prices (carbon taxes, emissions trading systems) with implicit carbon prices (specific energy taxes) and fossil fuel subsidies to calculate net effective carbon rates.

Key features:

- Net effective carbon rate calculations taking account of both positive prices and negative prices (subsidies)
- Sector-level detail showing coverage and rates for electricity, industry, buildings, road transport, and other sectors
- Identification of carbon pricing gaps (percentage of emissions priced at zero or negative rates)
- Time series data enabling trend analysis
- Available at https://www.oecd.org/tax/tax-policy/effective-carbon-rates.htm

Audit applications: Assess whether government has deployed price-based climate policy instruments; quantify carbon pricing coverage as a percentage of national emissions; identify fossil fuel subsidies contradicting climate policy; compare national carbon pricing against international practice; evaluate whether carbon prices are sufficient to drive behavioural change.

OECD Fossil Fuel Subsidy Inventory

OECD maintains the comprehensive Inventory of Support Measures for Fossil Fuels, covering member countries and selected partner economies. It provides detailed, comparable data on over 1,500 individual support measures, categorized by fuel type, mechanism, and objective.

Key features:

- Distinction between consumer support (affecting final prices paid) and producer support (affecting production)
- Categorization by support mechanism (direct transfer, tax expenditure, income/price support, etc.)
- Stated policy objective for each measure
- Annual updates with historical data
- Available at https://www.oecd.org/fossil-fuels/

Audit applications: Quantify total fossil fuel subsidies to compare against renewable energy support; identify specific subsidy measures for policy coherence assessment; track progress towards subsidy phase-out commitments; calculate subsidy equivalent as a percentage of climate finance.

World Bank State and Trends of Carbon Pricing

Published annually by the World Bank, this report tracks carbon pricing developments globally, covering carbon taxes, emissions trading systems, crediting mechanisms, and internal carbon pricing by corporations and financial institutions.

Key features:

- Coverage and price-level data for all operational carbon pricing instruments
- Revenue generation figures and revenue use analysis
- Emerging trends and policy developments
- Regional and sectoral coverage analysis
- Available at https://openknowledge.worldbank.org/

Audit applications: Track the evolution of carbon pricing policy; benchmark national carbon prices against international levels; assess revenue generation and use; identify policy gaps in sectoral coverage.

OECD-Environmental Data and Information System for Organisations and Networks (OECD-EDISON)

OECD-EDISON is an analytical tool helping countries calculate the fiscal impacts of climate change and assess how climate transition will affect long-term fiscal sustainability. The tool provides a common framework guiding users through key steps: identifying the macro-fiscal impacts of rising temperatures and climate events, revenue implications of decarbonization, and spending needed to meet climate targets. It enables comparison of fiscal impacts across different transition pathways, including early versus delayed action scenarios.

Key features:

- Standardized methodology for fiscal impact calculation
- Scenario comparison capabilities (transition pathways)
- Coverage of both physical risks and transition risks
- Framework applicable across OECD countries

Audit applications: Assess whether government fiscal projections incorporate realistic climate assumptions; compare national fiscal risk assessment against standardized methodology; evaluate whether the government has analysed different transition scenarios; benchmark fiscal preparedness against peer countries.

Climate Policy Explorer

Developed by researchers at the Potsdam Institute for Climate Impact Research and based on the Stechemesser et al. (2024) study[23] , the Climate Policy Explorer provides searchable access to 63 climate policy interventions that achieved significant emission reductions (averaging 19 percent).

Key features:

- Searchable by country, sector, and policy type
- Quantified emission reductions for each successful intervention
- Description of policy combinations (price-based + regulatory + subsidy instruments)
- Contextual information on country characteristics and policy timing
- Available at http://climate-policy-explorer.pik-potsdam.de/

Audit applications: Identify successful policy combinations from comparable countries; assess whether the national policy mix matches evidence-based effective approaches; evaluate whether the government has considered international evidence in policy design; benchmark expected emission reductions against achieved reductions elsewhere.

OECD Climate Actions and Policies Measurement Framework (CAPMF)

The OECD CAPMF catalogues climate policies across countries using consistent methodology, providing the most comprehensive global inventory of climate policies. It formed the foundation dataset for the Stechemesser et al. analysis of policy effectiveness.

Key features:

- Standardized categorization across policy types and sectors
- Coverage of 1,500+ policies implemented globally
- Implementation dates and policy stringency indicators
- Linkages to emissions data enabling effectiveness assessment

Audit applications: Compare national policy portfolios against international practice; identify policy gaps in specific sectors; assess policy instrument diversity; track policy evolution over time.

23 Annika Stechemesser et al. Climate policies that achieved major emission reductions: Global evidence from two decades.Science385,884-892(2024).DOI:10.1126/science.adl6547

A.3. National reporting and commitments under the UNFCCC

Audit applications: Establish audit criteria based on the government's own commitments; assess whether national policies align with NDC targets; evaluate whether NDC ambition is sufficient for Paris Agreement goals; track NDC updates for progressive ambition; compare NDC commitments across countries.

UNFCCC NDC synthesis reports

The UNFCCC periodically publishes synthesis reports aggregating all NDCs to assess collective progress towards Paris Agreement goals. These reports identify the emissions gaps between collective NDC commitments and pathways consistent with temperature limits.

Audit applications: Situate national commitments in a global context; identify whether collective ambition is sufficient; assess whether national targets align with fair share calculations; use emissions gap findings to justify the need for enhanced action.

National Adaptation Plans (NAPs)

Audit applications: Establish criteria for adaptation audits based on stated national priorities; assess whether adaptation financing aligns with NAP priorities; evaluate whether NAPs translate into operational programmes; compare adaptation approaches across countries with similar vulnerabilities.

Additional global emissions and NDC progress data

UNFCCC Global Climate Action Portal

Provides official country-level GHG inventories, emission trends, and NDC progress tracking.

Audit applications: Verify national emissions reporting; track progress towards NDC targets; cross-check government submissions against global assessments; establish audit baselines.

World Resources Institute (WRI) CAIT Climate Data Explorer

Historic GHG emissions data by country, sector, and gas, updated annually.

Audit applications: Independently track emissions trends; identify high-emitting sectors; corroborate government-reported data; benchmark national performance internationally.

Emissions Database for Global Atmospheric Research (EDGAR)

Global and sectoral GHG emissions estimates maintained by the EU Joint Research Centre.

Audit applications: Cross-validate national emissions data; analyse sectoral contributions; compare national emissions with peer countries; assess consistency with international reporting.

Climate Watch NDC Explorer (WRI)

Structured database of NDC targets, sectoral breakdowns, and quantitative projections.

Audit applications: Assess alignment of national policies with NDC targets; compare ambition and sectoral coverage internationally; support evaluation of policy implementation gaps.

FAOSTAT emissions and land use data

Data on GHG emissions from agriculture, forestry, and land-use changes.

Audit applications: Evaluate emissions from land-use sectors; benchmark national forestry and agriculture policies; monitor trends relevant to adaptation and mitigation priorities.

Global Carbon Project/Global Carbon Budget

Independent scientific estimates of global and national emissions trends.

Audit applications: Contextualize national emissions in global totals; verify consistency with government-reported data; identify emerging trends or gaps in reporting.

A.4. Audit frameworks and methodologies from INTOSAI

INTOSAI WGEA Guidance on Auditing Climate Change (2010)

This foundational INTOSAI guidance document provided SAIs with frameworks for conducting climate change audits, emphasizing assessment of government preparedness, policy implementation, and outcomes. While predating more recent developments, it established principles still relevant today.

Key elements:

- Framework for assessing government preparedness (governance, legal framework, institutions)
- Approaches to auditing mitigation and adaptation separately
- Emphasis on quantifying emissions as a starting point
- Available through INTOSAI WGEA at https://www.environmental-auditing.org/

Audit applications: Foundational framework for climate audit design; stage-appropriate approaches for SAIs beginning climate auditing; emphasis on governance and preparedness assessment.

INTOSAI WGEA Guidance on Environmental Auditing (2025)

Updated comprehensive guidance supporting audits on climate mainstreaming and policies related to water, energy, procurement, and resource allocation. Reflects evolution in climate audit practice and integration with broader environmental auditing.

Key elements:

- Climate-mainstreaming audit approaches
- Cross-cutting environmental-climate audits
- Integration of climate considerations in sectoral audits
- Available through INTOSAI WGEA

Audit applications: Current best practice guidance; approaches to mainstreaming audits; sectoral audit integration.

ClimateScanner tool

The ClimateScanner tool (see section 2.1) enables SAIs to review climate commitments, policies, and implementation across their jurisdictions. It focuses primarily on mitigation and provides a structured assessment framework that all SAIs can apply.

Key features:

- Standardized assessment framework enabling international comparison
- Coverage of governance, policy, and finance dimensions
- Flash report format for efficient communication of findings
- Growing database of ClimateScanner assessments from multiple countries
- Coordination through INTOSAI WGEA

Audit applications: Conduct systematic national mitigation policy review; benchmark against other countries; identify policy gaps using standardized framework; contribute to global overview of climate action; establish baseline for more detailed audits.

Note: While ClimateScanner assessments evaluate whether policies and structures exist, they do not assess the effectiveness of implementation, which would require follow-up performance audits as noted in the Guam ClimateScanner flash report.

IDI/INTOSAI WGEA Climate Change Adaptation Audit Framework

During 2023–2025, the initiative coordinated cooperative audits on climate change adaptation (see section 2.1), with around 50 SAIs participating in the ongoing global exercise. The framework provides structured approaches for adaptation auditing with particular attention to resource-constrained contexts.

Key features:

- Adaptation-specific audit methodologies
- Cooperative audit model enabling peer learning
- Attention to resource constraints facing developing country SAIs
- Coordination mechanism connecting participating SAIs
- Technical support and capacity building

Audit applications: Join cooperative audit for shared methodology and peer support; access adaptation audit frameworks appropriate for resource-constrained settings; benefit from IDI technical support and capacity building; contribute to international overview of adaptation action.

IDI Policy Coherence Audit Framework (2024)

Published in November 2024, this framework provides practical guidance to help auditors understand and evaluate policy coherence, including generic audit questions and methods for analysing policy coherence across sectors and government levels.

Key features:

- Structured approach to assessing policy coherence
- Generic audit questions adaptable to national contexts
- Methods for analysing cross-sectoral policy interactions
- Attention to vertical coherence (national-local)
- Available in English with Arabic, French, and Spanish translations in progress
- Available at https://www.idi.no/

Audit applications: Assess whether climate policies work together coherently; identify contradictions between policies; evaluate coordination across government levels; apply systematic policy coherence analysis.

INTOSAI WGEA Auditing Sustainable Development Goals (2022)

This WGEA document discusses key principles and tools on policy coherence and multi-stakeholder engagement and proposes going beyond a whole-of-government approach to adopt a whole-of-society approach.

Key elements:

- Tools and methods to address and assess policy coherence
- Policy coherence in budgeting and financing
- Policy coherence as an inclusive process
- Tools and methods to address and assess multi-stakeholder engagement by governments.
- Available through INTOSAI WGEA at https://environmental-auditing.org/media/3n0bnkss/wgea-wp5_sustainabledevelopementgoals_2022.pdf

INTOSAI WGEI Energy Transition Audit Guide

Offers structured approach for SAIs to evaluate governance arrangements, policy integration, financing mechanisms, and long-term planning horizons for energy transition from fossil fuels to renewables.

Audit applications: Conduct comprehensive energy transition audits; assess governance for cross-cutting energy issues; evaluate financing adequacy; examine long-term planning coherence.

A.5. Climate finance assessment tools

PEFA Climate Supplement

The Supplementary Framework for Assessing Climate Responsive Public Financial Management (PEFA Climate Supplement), published in April 2025, provides a standardized framework for assessing how countries integrate climate considerations into public financial management systems.

Key features:

- Assessment of climate budget tagging systems
- Evaluation of climate considerations in budget preparation and execution
- Assessment of climate risk integration in fiscal risk statements
- Climate dimensions in procurement and investment management
- Use of global climate indices to contextualize national action

Audit applications: Benchmark climate-responsive PFM practices; identify gaps in climate budget integration; assess quality of climate budget tagging; evaluate fiscal risk disclosure; provide criteria for PFM audit focused on climate dimensions.

Note: The Climate PEFA assessment itself is a valuable source of information for SAIs reviewing national climate change response, as demonstrated in the Philippines.

UNDP Study on Effectiveness of Climate Public Financial Management

UNDP's review of climate-responsive budgeting effectiveness provides evidence on what works and what does not in climate-sensitive PFM, identifying common challenges and good practices globally.

Key findings:

- Relatively few countries use emission changes as primary key performance indicators in climate PFM
- Mixed picture on adoption and effectiveness of climate budget tagging
- Adaptation harder to assess than mitigation
- Need for more systematic use of climate budget tagging data to inform decisions
- Audits and evaluation identified as areas needing improvement

Audit applications: Use findings as benchmarks for assessing national climate PFM; identify common weaknesses to examine; assess whether country faces typical implementation challenges; evaluate whether government has addressed identified gaps.

Climate Public Investment Management Assessment (C-PIMA)

Developed by the World Bank, C-PIMA provides a structured framework to evaluate how public investment management systems integrate climate considerations.

Key features:

- Evaluates planning, budgeting, appraisal, and monitoring of climate investments
- Identifies gaps in efficiency, effectiveness, and alignment with national climate strategies

Audit applications: Benchmark national climate investment management against international best practice; identify weaknesses in project appraisal, prioritization, or resource allocation; evaluate whether climate investments are likely to deliver intended mitigation or adaptation outcomes; inform recommendations for improved governance of climate-related public spending.

IMF Resilience and Sustainability Facility

IMF's Resilience and Sustainability Facility framework evaluates the fiscal and financial resilience of countries, including climate-related risks.

Key features:

- Integrates sovereign debt analysis, fiscal exposure to climate shocks, and macroeconomic sustainability
- Supports planning for resilient public investment

Audit applications: Assess whether government fiscal frameworks account for climate risks; evaluate integration of climate considerations into long-term debt and expenditure planning; benchmark national fiscal resilience against international norms; support audit conclusions on the sustainability of climate-related spending.

A.6. Scientific and technical resources

IPCC assessment reports

The Intergovernmental Panel on Climate Change (IPCC) publishes comprehensive assessment reports every 5–7 years synthesizing global climate science, impacts, and response options. These represent the authoritative scientific consensus on climate change.

Key components:

- Working Group I: Physical Science Basis
- Working Group II: Impacts, Adaptation, and Vulnerability
- Working Group III: Mitigation of Climate Change
- Synthesis report integrating all three working groups
- Special reports on specific topics (1.5°C warming, land, oceans, etc.)
- Available at https://www.ipcc.ch/

Audit applications: Establish scientific foundation for audit criteria; assess whether government policies reflect current climate science; evaluate whether adaptation planning uses appropriate climate projections; verify government claims against scientific consensus; identify emerging risks not yet addressed by policy.

National climate science reports and projections

Many countries produce national climate change reports, assessments, or communications that translate global climate science to national or regional contexts with downscaled projections.

Audit applications: Assess whether government planning uses appropriate national climate projections; evaluate whether risk assessments are based on current science; verify consistency between national reports and government policy assumptions.

Emissions Gap Report (UNEP)

Published annually by UNEP, the Emissions Gap Report assesses the gap between where greenhouse gas emissions are heading versus where they need to be to meet Paris Agreement temperature goals.

Audit applications: Contextualize national ambitions in global gaps; assess whether national targets align with fair share calculations; identify need for enhanced action; support recommendations for increased ambition.

A.7. Sector-specific tools and databases

International Energy Agency (IEA) data and analysis

IEA provides comprehensive energy statistics, analysis, and projections including detailed data on renewable energy deployment, fossil fuel production and consumption, energy efficiency, and energy-related emissions.

Key resources:

- World Energy Outlook with scenario analysis
- Energy statistics and balances by country
- Renewable energy deployment tracking
- Energy efficiency indicators and policies database
- Net Zero by 2050 Roadmap
- Available at https://www.iea.org/

Audit applications: Benchmark national energy sector performance; access energy transition scenarios; compare renewable deployment rates; assess energy efficiency progress; evaluate whether national energy plans align with net-zero pathways.

Global Forest Watch

A platform providing near-real-time data on forest change globally, including deforestation, forest fires, and forest cover. It is particularly relevant for countries where land use change is a significant emission source.

Audit applications: Monitor deforestation trends; assess government forest protection effectiveness; verify government deforestation data; identify hotspots requiring intervention; track forest-related commitments.

Climate Action Tracker

Independent scientific analysis tracking government climate action against Paris Agreement goals. Rates country targets and policies as “sufficient”, “insufficient”, “highly insufficient”, or “critically insufficient” relative to limiting warming to 1.5°C.

Key features:

- Regular updates on country climate policies
- Assessment of NDC adequacy
- Tracking of policy implementation
- Comparison across countries
- Available at https://climateactiontracker.org/

Audit applications: Independent assessment of whether national targets are adequate; identify policy-implementation gaps; benchmark national action internationally; support findings on need for enhanced ambition.

A.8. Regional and specialized resources

EU climate policy databases

The European Union maintains extensive databases on climate policy implementation, emissions trading, and renewable energy deployment across its member states.

Key resources:

- EU Emissions Trading System registry and transaction data
- National Energy and Climate Plans (NECPs) for all member states
- Progress reports on climate and energy targets
- European Environment Agency climate and energy data

Audit applications (for EU member states): Benchmark against other EU countries; assess compliance with EU directives; compare policy approaches across member states; access harmonized emissions data.

Pacific Climate Change Centre resources

Resources specific to Pacific island countries facing acute climate vulnerability, including adaptation planning frameworks, vulnerability assessments, and regional coordination mechanisms.

Audit applications (for Pacific SAIs): Access region-specific vulnerability assessments; benchmark against peer Pacific islands; utilize frameworks appropriate for Small Island Developing States; coordinate through regional audit mechanisms.

ClimateLinks (USAID)

Knowledge portal providing resources on integrating climate change considerations into development programmes, with particular focus on developing country contexts.

Audit applications: Access guidance on climate integration in development sectors; identify good practices in developing country contexts; assess development project climate considerations.

ANNEX B

GOOD PRACTICE EXAMPLES FROM SAI AUDITS

This annex identifies good practices from SAI climate audits, organized thematically. The practices are described broadly to enable SAIs to recognize and adapt similar approaches used across different national contexts. Country names in parentheses indicate (some of) the SAIs where these practices have been observed.

B.1. Establishing context and baseline

Overall national assessment

- Quantification of greenhouse gas emissions trends over multi-year periods to establish baseline context (United Kingdom 3, ECA 3)
- Comparison of national emissions performance against international peer countries using standardized metrics (Canada 4, Lithuania)
- Use of global risk indices to situate national climate vulnerability in an international context (Philippines)
- Mapping of governance architecture showing institutional responsibilities and coordination mechanisms across government levels (Philippines, United Kingdom 3, Fiji, India)
- Assessment of consistency between stated climate commitments and actual policy implementation trajectories (Spain, Portugal)

Risk assessment and vulnerability analysis

- Quantification of value at risk from climate hazards (Malta)
- Geographic mapping of climate risk distribution to identify under-protected high-vulnerability areas (Malta, Tanzania 2)
- Multi-year longitudinal analysis of climate impact trends rather than point-in-time snapshots (Tanzania 2, Colombia 2)
- Identification of populations and assets most vulnerable to specific climate impacts (Tanzania 1, India 1, Malta 1)
- Assessment of how multiple climate risks interact and cascade through interconnected systems (Netherlands 2)

B.2. Audit design and evidence gathering

Sampling and site selection

- Use of objective risk-based criteria for geographic site selection (Philippines, Tanzania 1)
- Inclusion of both high-capacity and resource-constrained jurisdictions to distinguish systemic from localized failures (Tanzania 1)
- Comparative sampling of regions with and without interventions (Tanzania)
- Sufficient sample size to distinguish patterns from outliers while remaining resource-efficient (Tanzania, Malta)

Evidence triangulation and validation

- Combination of document review, interviews, and physical site verification to cross-validate findings (India 2, Philippines, Tanzania 1, Maldives 1)
- Use of aerial photography and satellite imagery to verify documentary claims and identify unreported issues (Tanzania 2, Colombia 1, Malta 1, United Kingdom 5, India 2, Maldives 1)
- Time-series analysis of publicly available satellite images to document environmental changes over extended periods (Maldives 1, Colombia 2)

- Cross-checking government data against external authoritative sources (Tanzania1)
- Consultation with climate experts and former senior officials to validate findings and identify lessons learned (Canada 4)

Audit criteria and benchmarking

- Linking findings to specific legislative sections, regulations, or policy commitments to ensure legal defensibility (Tanzania 1, Malta 1)
- Comparison of national performance against international standards and frameworks (Malta 1, Fiji, United Kingdom 3)
- Establishment of quantified baselines showing measurable gaps in coverage, compliance, or capacity (Tanzania 1)

B.3. Assessing mitigation progress and effectiveness

Measuring implementation progress

- Assessment of multiple mitigation measures against standardized criteria covering timeliness, reliability of estimates, value for money, and equity (Finland, Denmark 1, Norway, Canada 3)
- Quantification of expected greenhouse gas impact from sectoral policies and comparison with actual achievement (Germany 1, Sweden, Canada 1)
- Tracking of renewable energy deployment progress against targets with analysis of shortfall causes (Lithuania)
- Documentation of emissions trend direction relative to stated reduction commitments (Lithuania)

Governance and coordination assessment

- Analysis of distribution of climate expenditure across ministries to identify gap between formal responsibility and actual spending power (United Kingdom 5, Netherlands 1)
- Assessing whether coordination mechanisms function effectively rather than merely exist nominally (Norway 2, Tanzania 1, Netherlands 2, United Kingdom 3)
- Examination of alignment between national climate strategies and local government implementation capacity and resources (United Kingdom 5 and 6, Lithuania)
- Evaluation of multi-jurisdictional coordination challenges and their impact on policy effectiveness (Norway 2, Canada 7, United Kingdom 3)

Policy coherence analysis

- Quantification and comparison of fossil fuel subsidies versus renewable energy support (ECA 5, Brazil 1, Estonia)
- Documentation of specific instances where programmes ostensibly supporting climate goals actually subsidized emission-increasing activities (Canada 1)
- Examination of whether agricultural and water policies support or undermine environmental objectives (Spain 1, Portugal 1, ECA 1, Colombia 2, Cyprus 2)
- Assessment of whether sectoral policies align with whole-of-government climate targets (Lithuania, Canada 2, Norway 2)

B.4. Assessing adaptation effectiveness

Infrastructure and physical adaptation

- Assessing whether flood defences and infrastructure are designed for projected future climate scenarios rather than historical patterns (United Kingdom 2)
- Evaluation of whether infrastructure investments incorporate climate risk assessment in design and location decisions (Malta 1, United Kingdom 2)

Adaptation planning and prioritization

- Assessment of whether adaptation investments align with stated risk priorities from risk assessments (Pacific SAIs)
- Examination of whether most vulnerable populations and locations receive priority for adaptation resources (Tanzania 1, Pacific SAIs)
- Quantification of implementation gaps against planned activities (Philippines, Tanzania 1)
- Analysis of whether adaptation sequencing follows strategic logic based on urgency and cost-effectiveness (Pacific SAIs)

Nature-based solutions and ecosystem protection

- Assessment of coordination between climate adaptation and biodiversity protection objectives (India 2, Sri Lanka 1)
- Assessment of whether adaptation measures support or reduce ecosystem resilience (Spain 1, Portugal 1)
- Use of aerial photography to document ecosystem degradation and effectiveness of conservation measures (India 2, Maldives 1)

B.5. Financial analysis and value for money

Climate finance tracking

- Tracking of whether climate finance revenues are used for designated purposes rather than general budgets (Philippines, Tanzania 1)
- Assessment of budget allocation patterns across government levels to identify funding adequacy (Tanzania 1)
- Examination of aid dependency and sustainability of external funding reliance (Tanzania 1)
- Quantification of aggregate shortfalls in financial assurance mechanisms relative to decommissioning liabilities (Australia 2, United Kingdom 1)

Cost-effectiveness and value analysis

- Comparison of prevention costs versus response and recovery expenditure to assess investment priorities (Tanzania 1)
- Analysis of adaptation investment cost-benefit ratios and life cycle costs (United Kingdom9)
- Assessment of proportionality between governance structures and budgets managed relative to outcomes delivered (Ireland 2)
- Quantification of taxpayer exposure from inadequate financial provisions for decommissioning liabilities (United Kingdom 1)

Economic transition and fiscal risk

- Assessment of whether fiscal projections incorporate realistic scenarios for energy transition and fossil fuel revenue changes (INTOSAI SCEI analysis)
- Examination of whether new fossil fuel infrastructure investments include scenario analysis for potential demand decline (United Kingdom 1, Australia 2)
- Analysis of whether financial assurance mechanisms keep pace with inflation and evolving cost estimates (Australia 2)
- Evaluation of post-closure funding gaps for mines and oil wells and contingent liabilities not captured in current provisions (Australia 2, United Kingdom 1)

B.6. Compliance auditing approaches

Regulatory framework assessment

- Verification that organizational structures conform to their legislation (multiple examples)
- Assessment of alignment between domestic regulations and international agreement obligations (Fiji, Tanzania 2)
- Checking that measurements, fees, and charges follow prescribed methodologies (Estonia)
- Examination of whether institutional arrangements operate according to their governing rules (IDI adaptation audits, ClimateScanner reviews)

Verification and measurement systems

- Independent verification of self-reported data from regulated entities (Estonia)
- Assessment of whether claimed activities genuinely meet regulatory definitions rather than exploiting loopholes (Philippines, Estonia)
- Cross-checking of reported emissions or resource use against physical evidence (Estonia)
- Verification of pricing transparency and supporting documentation in environmental markets (Tanzania 2)

- For market-based climate instruments, assess whether the economic signal (price/incentive) is adequate to drive the behavioural change the policy intends (United Kingdom 4)

Propriety and governance

- Verification that competent legal authority reviewed contractual agreements for major projects (Tanzania 1)
- Assessment of benefit-sharing arrangements for equity and transparency (Tanzania 1)
- Examination of capacity assessments before project authorization (Tanzania 1)
- Analysis of whether discretionary decisions served public environmental interest or facilitated avoidance (India 2, Estonia, Tanzania 1)

B.7. Findings presentation and impact

Leading with materiality

- Opening findings with quantified impact data including deaths, injuries, properties damaged, and economic losses (Tanzania 2, Colombia1)
- Establishing significance through trend visualization before detailing systemic causes (Tanzania 1)
- Focusing on actual risk reduction achieved rather than plans produced (United Kingdom2, Tanzania 1)
- Converting qualitative observations into quantitative metrics for clarity (multiple audits)

Evidence-based recommendations

- Specification of concrete actions with designated responsible bodies (Tanzania 1)
- Sequencing of recommendations to identify foundational actions before dependent ones (Tanzania 1)
- Distinction between recommendations for national policy, regional coordination, and local implementation (Tanzania 1)

Synthesis and lessons learned

- Distillation of multiple audit findings into memorable framework of systemic lessons rather than listing isolated problems (Canada 4)
- Organization of lessons around actionable themes that link diagnosis to solution pathways (Canada)
- Forward-looking questions for policymakers that prompt action without prescribing specific solutions (Canada)

International context and benchmarking

- Use of international performance comparisons to show where a country stands relative to its peers (Canada, Philippines)
- Reference to successful policy combinations from comparable countries (Canada 4, United Kingdom Climate Change Committee model, independent advisory body)
- Application of international frameworks to assess domestic compliance (Malta, Fiji, ClimateScanner reviews)
- Drawing on lessons learned from other SAIs' climate auditing experiences (Canada 4, Portugal, Spain)

B.8. Resource-efficient approaches for SAIs

Low-resource methodologies

- Purposive sampling with clear criteria delivering robust evidence despite limited geographic coverage (Tanzania)
- Physical site verification compensating for weak management information systems (Tanzania, Fiji, Maldives)
- Multi-year scope enabling trend analysis without complex longitudinal datasets (Tanzania)
- Use of publicly available satellite imagery rather than commissioning custom surveys (Maldives)
- Leveraging existing international data and frameworks rather than generating analysis from scratch (use of OECD data, IPCC projections, ND-GAIN indices)

Collaborative approaches

- Joint audits by SAIs in neighbouring countries with shared climate challenges enabling bilateral analysis (Spain, Portugal)
- Participation in international cooperative audits with shared methodology and peer learning (IDI adaptation audits, ClimateScanner)
- Regional SAI collaboration on common challenges with shared capacity constraints (Pacific SAIs on adaptation sequencing)

Focusing scope strategically

- Sector-specific deep-dive audits providing granular detail that complements broader assessments (Lithuania)
- Entity-level audits of individual bodies combined with thematic cross-sector reviews (Wales)
- Follow-up on previous recommendations to create cumulative accountability (multiple)
- Synthesis of past audit work to build institutional knowledge and identify patterns (Canada)
- When planning audits of climate policies that operate alongside other interventions, map the full suite of related policies and assess interaction effects (United Kingdom 9)

Note: These practices are drawn from audit reports referenced throughout the main guidance document. SAIs should adapt these approaches to their national context, legal mandate, and resource constraints. Both the list of good practices and the attribution to specific SAIs is non-exhaustive. Other SAIs have followed most of these good practices and developed other good practices. The grouping by theme here is intended to help SAIs identify practices relevant to their specific audit objectives.

ANNEX C

GOAL DISPLACEMENT

Climate policies and programmes can fail to achieve their intended outcomes even when substantial resources are spent and procedures are followed. Organizational theory and public administration scholarship have developed specific terminology to describe these failures. Understanding these concepts helps auditors identify where climate governance breaks down:

Goal displacement: The original goals of an organization or programme are overshadowed or replaced by the means used to achieve them. Instead of focusing on end results (emissions reductions, climate resilience), focus shifts to process completion (plans prepared, committees established, reports submitted). Coined by sociologist Robert K. Merton, this term describes situations where the question "Did we follow procedures?" replaces "Did we achieve objectives?"

Bureaucratic ritualism: Rigid adherence to rules and procedures to the point where they become ends in themselves rather than means to achieve goals. Officials become so focused on following procedures correctly that they lose sight of the policy's ultimate purpose.

Means-ends inversion: When following procedures (means) becomes more important than achieving objectives (ends). The instrumental value transforms into a terminal value: what was originally a tool for achieving climate goals becomes the goal itself.

Red tape: Excessive bureaucratic processes, forms, and procedures that hinder rather than help achieve organizational goals. Red tape can contribute to goal displacement by making process compliance so burdensome that substantive work on outcomes becomes secondary.

Organizational ritualism: The performance of certain tasks to demonstrate compliance and loyalty to the organization rather than to achieve practical outcomes. Activities are for show rather than utility, with ceremonies and rituals becoming more important than their purpose.

Formalism: Excessive emphasis on forms, procedures, and documentation over substantive achievement. Related to ritualism but specifically highlights the prioritization of formal requirements over real-world impact.

Trained incapacity: Officials become so specialized in particular procedures that they cannot adapt to new situations or recognize when standard approaches prove inadequate.

Displacement of sentiments: Emotional attachment and loyalty shift from organizational goals to the rules themselves. Officials develop personal investment in maintaining procedures and structures even when these no longer serve climate objectives effectively.

Output versus outcome confusion: Measuring success by outputs (activities completed, funds disbursed, infrastructure built) rather than outcomes (emissions reduced, vulnerability decreased, ecosystems restored). This proves particularly problematic in climate action where outputs like "renewable energy capacity installed" may not translate to outcomes like "fossil fuel displacement achieved" if systemic factors prevent new capacity from being utilized.

ANNEX D

EFFECTIVE RECOMMENDATIONS: GOOD PRACTICE EXAMPLES

This annex provides additional discussion on drafting recommendations and examples of good practice from climate audits globally.

Avoiding low causal specificity

Recommendations with low causal specificity, where compliance does not clearly translate into improved outcomes, are particularly common in coordination-related findings.

Weak coordination recommendation:
"The government should improve coordination between ministries on climate adaptation"

Problems:

- No specification of what decisions need coordination
- No clarity on whether coordination body can reallocate resources
- Easy to "implement" through more meetings without changing outcomes
- Fails the specificity test

Better coordination recommendation (Marshall Islands): "Ministry of Works, Infrastructure and Utilities ensures construction of seawalls gives priority to coastal areas that are most vulnerable to the impacts of sea level rise, and uses findings in the vulnerability assessment report as the basis for setting priorities."

This kind of recommendation:

- Focuses on the decision (prioritization) not the coordination process
- Specifies what evidence drives decisions
- Can verify implementation by checking actual seawall locations
- Respects management prerogative on exact locations

The best approach can be to focus on conclusions that make the required action apparent: "Despite three inter-ministerial committees established since 2018, climate spending remains concentrated in [low-risk region] while [high-risk region] receives 15 percent of per-capita adaptation funding despite facing three times the exposure to sea-level rise."

This conclusion shows coordination failure through its consequences rather than prescribing process fixes.

Examples of strong recommendations from recent audits

Tanzania carbon trading—quantified consequence: "Tanzania has lost TSh1.26 trillion in potential revenue from carbon trading due to weak coordination, lack of proper guidance, and limited public sensitisation. From January 2023 to July 2024, Tanzania managed to generate only TSh36 billion from carbon credit sales, representing just three percent of the TSh1.26 trillion the country could have earned."

Analysis: The specific quantified loss (TSh1.26 trillion) and the degree of failure (97 percent) combine to make this a striking conclusion and a clear call for action.

Solomon Islands—specific deliverables with timeline: "To scale up efforts to prioritize key actions to strengthen adaptation initiatives and clear time frame for completing them. Including, allocate sufficient resources to complete the vulnerability assessments, national climate change bill, relocation plan strategy and National Adaptation Plan."

Analysis: This specifies exactly what needs completing with a clear timeline. It does not restrict itself to "improving planning" but identifies concrete deliverables.

US Government Accountability Office—mainstreaming into standards: "Working with relevant professional associations to incorporate climate change information into structural design standards."

Analysis: This focuses on a decision point (design standards) that is reorganization-proof. Once climate information is embedded in professional standards, it persists regardless of which ministry holds climate responsibility.

Lithuania—legally binding obligations: "Establish fuel supplier obligations with sanctions for non-compliance to ensure 14 percent transport emissions reduction by 2030."

Analysis: This combines a specific target (14 percent reduction) with an enforcement mechanism (supplier obligations, sanctions). It creates a legal obligation not just policy aspiration. The timeline makes it verifiable.

BIBLIOGRAPHY

Supreme audit institution reports

Australia

Australia 1. Australian National Audit Office (2024). *Governance of Climate Change Commitments*. Canberra, Australia. https://www.anao.gov.au/work/performance-audit/governance-climate-change-commitments

Australia 2. Auditor-General for New South Wales (2025). *Regulating Mine Rehabilitation*. Sydney, Australia. https://www.audit.nsw.gov.au/our-work/reports/regulating-mine-rehabilitation

Austria

Austrian Court of Audit (Rechnungshof) (2024). *Climate Change Adaptation Action — Wels and Wiener Neustadt* [Maßnahmen zur Anpassung an den Klimawandel — Wels und Wiener Neustadt]. Vienna, Austria.

Belgium

Belgium 1. Rekenhof (2023). *Parcs éoliens offshore – Construction, raccordement et exploitation* [Offshore Wind Farms – Construction, Connection and Operation]. Brussels, Belgium. https://www.ccrek.be/fr/publication/parcs-eoliens-offshore

Belgium 2. Rekenhof (2025). *Hernieuwbare energie in Vlaanderen: Doelstellingen, plannen en uitvoering* [Renewable Energy in Flanders: Objectives, Plans and Implementation]. Verslag van het Rekenhof aan het Vlaams Parlement. Brussels, Belgium. September 2025. https://www.ccrek.be/nl/publicatie/hernieuwbare-energie-in-vlaanderen-doelstellingen-plannen

Brazil

Brazil 1. Tribunal de Contas da União (2023). *Relatório de Auditoria Operacional sobre as Políticas Públicas para a Transição Energética* [Operational Audit Report on Public Policies for Energy Transition]. TC 020.606/2023-0. Brasília, Brazil.

Brazil 2. Tribunal de Contas da União (2024). *Climate Governance*. ClimateScanner Assessment. Brasília, Brazil.

Brazil 3. Tribunal de Contas da União (2024). *Audit on Climate Change Adaptation and Greenhouse Gas Mitigation Actions in Agriculture*. Brasília, Brazil.

Bulgaria

Smetna Palata [National Audit Office of Bulgaria] (2025). Conservation, Restoration and Sustainable Management of Forests [Опазване, възстановяване и устойчиво управление на горите]. Audit Report No. 0300101323. Sofia, Bulgaria.

Canada

Canada 1. Office of the Auditor General of Canada (2021). *Emissions Reduction Fund — Natural Resources Canada*. Report 4, Reports of the Commissioner of the Environment and Sustainable Development (CESD) to the Parliament of Canada. Ottawa, Canada. https://www.oag-bvg.gc.ca/internet/English/parl_cesd_202111_04_e_43981.html

Canada 2. Office of the Auditor General of Canada (2022). *Carbon Pricing — Environment and Climate Change Canada*. Report 5, Reports of the Commissioner of the Environment and Sustainable Development (CESD) to the Parliament of Canada. Ottawa, Canada. https://www.oag-bvg.gc.ca/internet/English/parl_cesd_202204_05_e_44025.html

Canada 3. Office of the Auditor General of Canada (2024). *Canadian Net-Zero Emissions Accountability Act — 2024 Report*. Report 7, Reports of the Commissioner of the Environment and Sustainable Development (CESD) to the Parliament of Canada. Ottawa, Canada. https://www.oag-bvg.gc.ca/internet/docs/parl_cesd_202411_07_e.pdf

Canada 4. Office of the Auditor General of Canada (2021). *Lessons Learned from Canada's Record on Climate Change*. Report 5, Reports of the Commissioner of the Environment and Sustainable Development (CESD) to the Parliament of Canada. Ottawa, Canada. https://www.oag-bvg.gc.ca/internet/English/parl_cesd_202111_05_e_43980.html

Canada 5. Office of the Auditor General of Canada (2023). *Forests and Climate Change*. Report 1, Reports of the Commissioner of the Environment and Sustainable Development (CESD) to the Parliament of Canada. Ottawa, Canada. https://www.oag-bvg.gc.ca/internet/English/parl_cesd_202311_01_e_44233.html

Canada 6. Office of the Auditor General of Canada (2023). *Emission Reductions Through Greenhouse Gas Regulations — Environment and Climate Change Canada*. Report 5, Reports of the Commissioner of the Environment and Sustainable Development (CESD) to the Parliament of Canada. Ottawa, Canada. https://www.oag-bvg.gc.ca/internet/English/parl_cesd_202311_05_e_44237.html

Canada 7. Office of the Auditor General of Canada (2023). *Canadian Net-Zero Emissions Accountability Act — 2030 Emissions Reduction Plan*. Report 6, Reports of the Commissioner of the Environment and Sustainable Development (CESD) to the Parliament of Canada. Ottawa, Canada. https://www.oag-bvg.gc.ca/internet/English/parl_cesd_202311_06_e_44238.html

Colombia

Colombia 1. Contraloría General de la República (2023). *Evaluación de los Recursos Destinados para el Control de la Deforestación en los Municipios PDET en Colombia durante el Período 2017–2022* [Evaluation of Resources for Deforestation Control in PDET Municipalities]. Bogotá, Colombia. https://www.contraloria.gov.co/web/guest/resultados/informes/analisis-sectoriales-y-politicas-publicas/medio-ambiente

Colombia 2. Contraloría General de la República (2023). *Estudio Ambiental Estratégico Interactivo sobre Análisis de la Gestión Pública frente al Fenómeno de la Desertificación en el Territorio Colombiano* [Strategic Environmental Study on Public Management of Desertification]. Bogotá, Colombia. https://www.contraloria.gov.co/web/guest/resultados/informes/analisis-sectoriales-y-politicas-publicas/medio-ambiente

Costa rica

Costa Rica 1. Contraloría General de la República (2021). *Desafíos de la Transición Energética desde la Perspectiva de la Hacienda Pública* [Challenges of Energy Transition from the Public Finance Perspective]. San José, Costa Rica.

Costa Rica 2. Contraloría General de la República (2024). *Informe de Seguimiento de la Gestión Pública sobre el Panorama País en Acciones Climáticas*. DFOE-SOS-SGP-00003-2024. San José, Costa Rica.

Cyprus

Cyprus 1. Audit Office of the Republic of Cyprus (2023). *Special Report PE/02/2023: Audit on Actions Taken by the Republic of Cyprus for the Reduction of Greenhouse Gas Emissions*. Nicosia, Cyprus.

Cyprus 2. Audit Office of the Republic of Cyprus (2025). *Special Report ΠΕ/01/2025: Climate Change Adaptation Actions for Water Resources Management*. Nicosia, Cyprus.

Czech republic

Nejvyšší kontrolní úřad [Supreme Audit Office of the Czech Republic] (2025). *Peněžní prostředky Modernizačního fondu určené na podporu obnovitelných zdrojů energie* [Modernization Fund Resources for the Support of Renewable Energy Sources]. Kontrolní akce č. 24/06. Prague, Czech Republic.

Denmark

Denmark 1. Rigsrevisionen (2025). *Administration of Subsidy Schemes Aimed at Contributing to CO_2 Reductions*. Report 2/2025. Copenhagen, Denmark.

Denmark 2. Rigsrevisionen (2024). *The Danish Ministry of Food's Oversight of Nitrogen Emission from the Application of Fertiliser in the Agricultural Sector*. Report 2/2024. Copenhagen, Denmark.

Estonia

National Audit Office of Estonia (2025). *Keskkonnatasude määramine ja järelevalve keskkonnakasutuse üle* [Establishment of Environmental Fees and Supervision of Environmental Use]. Tallinn, Estonia.

European union

ECA 1. European Court of Auditors (2019). *Combating Desertification in the EU: A Growing Threat in Need of More Action*. Special Report 33/2018. Luxembourg.

ECA 2. European Court of Auditors (2022). *Climate Spending in the 2014-2020 EU Budget: Not as High as Reported*. Special Report 09/2022. Luxembourg.

ECA 3. European Court of Auditors (2023). *EU Climate and Energy Targets: 2020 Targets Achieved, but Little Indication that Actions to Reach the 2030 Targets Will Be Sufficient*. Special Report 18/2023. Luxembourg.

ECA 4. European Court of Auditors (2024). *Climate Adaptation in the EU: Action Not Keeping Up with Ambition*. Special Report 15/2024. Luxembourg.

ECA 5. European Court of Auditors (2022). *Review 01/2022: Energy taxation, carbon pricing and energy subsidies.* Luxembourg.

Fiji

Office of the Auditor General (2024). *Performance Audit on Implementation of Climate Change Adaptation Actions*. Suva, Fiji.

Finland

Finland 1. National Audit Office of Finland (Valtiontalouden tarkastusvirasto) (2025). *Knowledge Base of Climate Policy*. Audit Report 3/2025. Helsinki, Finland.

Finland 2. National Audit Office of Finland (Valtiontalouden tarkastusvirasto) (2025). *Energy Investment Aid as a Driver for the Green Transition*. Audit Report 16/2025. Helsinki, Finland.

France

France 1. Cour des Comptes (2021). *La politique de développement des biocarburants* [The Biofuels Development Policy]. Paris, France. 20 December 2021.

France 2. Cour des Comptes (2023). *La prise en compte de l'environnement dans le budget et les comptes de l'État* [Taking the Environment into Account in the State Budget and Accounts]. Paris, France. 27 July 2023.

Germany

Germany 1. Bundesrechnungshof (2024). *Umsetzung der Energiewende im Hinblick auf die Versorgungssicherheit, Bezahlbarkeit und Umweltverträglichkeit der Stromversorgung* [Implementation of the Energy Transition with Regard to Security of Supply, Affordability and Environmental Compatibility of Electricity Supply]. Sonderbericht [Special Report]. Bonn, Germany. 7 March 2024.

Germany 2. Bundesrechnungshof (2024). *ClimateScanner Assessment Report*. Bonn, Germany.

Germany 3. Bundesrechnungshof (2022). *Special report on climate change governance in Germany*. Bonn, Germany. 24 March 2022.

India

India 1. Comptroller and Auditor General of India (2019). *Assessment of Environmental Impact due to Mining Activities and its Mitigation in Coal India Limited and its Subsidiaries*. Report No. 12 of 2019. New Delhi, India.

India 2. Comptroller and Auditor General of India (2022). *Performance Audit on Conservation of Coastal Ecosystems*. Report No. 4 of 2022. New Delhi, India.

Indonesia

Badan Pemeriksa Keuangan (2023). *Energy Management Audit (IHPS I 2023)*. Jakarta, Indonesia.

Ireland

Ireland 1. Comptroller and Auditor General of Ireland (2016). *Strategic Planning for Flood Risk Management*. Dublin, Ireland.

Ireland 2. Comptroller and Auditor General of Ireland (2024). *Report on the Accounts of the Public Services 2023*. Chapter 4: Adapting Flood Risk Management to Climate Change Impacts. Dublin, Ireland.

Israel

Israel 1. State Comptroller and Ombudsman of Israel (2023). *Climate Enforcement Follow-up Audit*. Jerusalem, Israel.

Israel 2. State Comptroller and Ombudsman of Israel (2024). *National Climate Action by the Government of Israel Extended Follow-up Audit*, Israel.

Latvia

State Audit Office of Latvia (2024). *Are the Funds of the Emission Allowance Auction Instrument Planned in a Cost-Effective Manner?* Performance Audit Report. Riga, Latvia.

Lithuania

National Audit Office of Lithuania (2024). *Implementation of the Energy Independence Targets in the Transport Sector*. Vilnius, Lithuania. https://www.valstybeskontrole.lt/EN/Post/17837/greenhouse-gas-emissions-from-transport-are-falling-too-slowly

Madagascar

Cour des Comptes (2025). *Performance Audit of Madagascar's Climate Change National Adaptation Plan (NAP) and its Implementation in Biodiversity and Forestry Sectors*. Antananarivo, Madagascar.

Maldives

Maldives 1. Auditor General's Office (2025). *Environmental Audit Report on Governance of Protected Areas in Baa Atoll UNESCO Biosphere Reserve*. Malé, Maldives.

Maldives 2. Auditor General's Office (2025). *Climate Scanner Assessment Report on Governance*. Malé, Maldives.

Maldives 3. Auditor General's Office (2025). *Climate Scanner Assessment Report on Public Policy and Climate Finance*. Malé, Maldives.

Malta

Malta 1. National Audit Office (2025). *Climate Change Adaptation: Evaluating Malta's Efforts Relating to Flooding and Sea Level Rise*. Valletta, Malta.

Malta 2. National Audit Office (2025). *A Review of Malta's Climate Action Using the ClimateScanner Framework*. Valletta, Malta.

Micronesia (federated states of)

Office of the National Public Auditor (2025). *Planning, Implementation, Monitoring and Reporting of FSM's Climate Change Adaptation Actions Needs Improvement*. Palikir, Federated States of Micronesia.

Morocco

Court of Accounts of Morocco (2024). *Annual Report 2023-24* [including sections on EU Carbon Border Adjustment and energy transition]. Rabat, Morocco.

Netherlands

Netherlands 1. Algemene Rekenkamer (2023). *Inzicht in uitgaven klimaatbeleid* [Climate Expenditure]. The Hague, Netherlands. 25 January 2023. (English summary published November 2023).

Netherlands 2. Algemene Rekenkamer (2024). *Energy Saving Obligation, 2008-2023: High Ambitions, Unknown Results*. The Hague, Netherlands. 21 November 2024.

Netherlands 3. Algemene Rekenkamer (2025). *Deelonderzoek behorend bij het verantwoordingsonderzoek ministerie van Binnenlandse Zaken en Koninkrijksrelaties, Gemeentefonds en Provinciefonds* [Sub-study of the Accountability Audit of the Ministry of the Interior and Kingdom Relations - CO2 Reporting]. The Hague, Netherlands. 21 May 2025.

New caledonia

New Caledonia 1. Chambre Territoriale des Comptes (2024). *Civil Security in New Caledonia for Major Climatic Risks*. Nouméa, New Caledonia.

New Caledonia 2. Chambre Territoriale des Comptes (2025). *Adaptation Measures to Address the Risk of Coastal Erosion*. Nouméa, New Caledonia.

New zealand

Office of the Auditor-General (2024). *How Well Four Councils are Responding to a Changing Climate*. Wellington, New Zealand.

Norway

Norway 1. Office of the Auditor General of Norway (Riksrevisjonen) (2025). *Annual Financial Audit Report* [including analysis of Government Pension Fund Global and petroleum revenue sustainability]. Oslo, Norway.

Norway 2. Office of the Auditor General of Norway (Riksrevisjonen) (2024). *The Authorities' Governance and Coordination to Achieve the Climate Targets Adopted by the Parliament*. Document 3:15 (2023–2024). Oslo, Norway.

Norway 3. Office of the Auditor General of Norway (Riksrevisjonen) (2025). *The Reduction of greenhouse gas emissions from agriculture*. Dokument 3:13 (2024–2025). Oslo, Norway.

Pakistan

Office of the Auditor General (2025). *Audit Report on the Accounts of the Climate Change, Environment and Disaster Recovery Organizations of the Federal Government 2024-25*. Islamabad, Pakistan.

Philippines

Commission on Audit (2024). *National Climate Change Action Plan (NCCAP) Audit*. Manila, Philippines.

Poland

Najwyższa Izba Kontroli (NIK) (2024). *Realizacja projektu strategicznego "Leśne Gospodarstwa Węglowe"* [Implementation of the Strategic Project "Forest Carbon Farms"]. Informacja o wynikach kontroli P/23/057. Warsaw, Poland. https://www.nik.gov.pl/plik/id,30004,vp,33007.pdf

Portugal

Portugal 1. Tribunal de Contas (2019). *Auditoria ao Programa de Acção Nacional de Combate à Desertificação* [Audit of the Programme to Fight Desertification]. Relatório No. 19/2019. Lisbon, Portugal.

Portugal 2. Tribunal de Contas (Portugal) and Tribunal de Cuentas (Spain) (2023). *Informe Conjunto: Fiscalização sobre Actuações de Defesa contra a Desertificação* [Joint Report: Audit on Actions to Combat Desertification]. Lisbon/Madrid. Approved 9 May 2023.

Solomon islands

Office of the Auditor General (2025). *The Implementation of the Solomon Islands Climate Change Adaptation Programme (SICAP)*. Honiara, Solomon Islands.

South africa

Auditor-General of South Africa (2022). *Follow-up Performance Audit at the Department of Mineral Resources and Energy on the Rehabilitation of Derelict and Ownerless Mines*. RP93/2022. ISBN: 978-0-621-50197-1. Pretoria, South Africa. www.agsa.co.za

Spain

Spain 1. Tribunal de Cuentas (2020). *Informe de Fiscalización sobre las Actuaciones de Defensa contra la Desertificación y de Prevención y Extinción de Incendios Forestales, Ejercicio 2018* [Audit Report on Actions to Combat Desertification and Forest Fire Prevention and Suppression, Fiscal Year 2018]. Madrid, Spain.

Spain 2. Tribunal de Cuentas (Spain) and Tribunal de Contas (Portugal) (2023). *Informe Conjunto: Fiscalización sobre Actuaciones de Defensa contra la Desertificación* [Joint Report: Audit on Actions to Combat Desertification]. Madrid/Lisbon. https://www.tcu.es/export/sites/default/.galleries/pdf/RelInternacionales/Informe-conjunto_castellano.pdf

Spain 3. Tribunal de Cuentas (2023). *¿Han adaptado las Comunidades Autónomas de Cantabria y Extremadura sus planes de prevención, vigilancia y extinción de incendios forestales a las condiciones actuales de expansión y desestacionalización de incendios?* [Have the Autonomous Communities of Cantabria and Extremadura Adapted Their Plans for Prevention,

Vigilance and Fighting Forest Fires to the Present De-Seasonalisation of Wildfires?]. Madrid, Spain.

Spain 4. Tribunal de Cuentas (2023). *Nota de Actualización de la Fiscalización sobre Actuaciones de Defensa contra la Desertificación y de Prevención y Extinción de Incendios Forestales* [Update Note on the Audit of Actions to Combat Desertification and Forest Fire Prevention and Suppression]. Report No. 1,535. Madrid, Spain. Approved 26 October 2023.

Spain 5. Tribunal de Cuentas (2024). *Informe de Fiscalización de las Medidas de Ahorro y Eficiencia Energética en el Ámbito Local* [Audit Report on Energy Saving and Energy Efficiency Measures at the Local Level]. Report No. 1,607. Madrid, Spain. Approved 18 December 2024.

Sri lanka

Sri Lanka 1. National Audit Office (2022). *Conservation of Coastal and Marine National Parks in Sri Lanka*. Report No. PER/B/2020/04. Colombo, Sri Lanka.

Sri Lanka 2. National Audit Office (2022). *Evaluate the Process of Developing New Renewable Energy Sources*. Colombo, Sri Lanka.

Sweden

Sweden 1. Swedish National Audit Office (2023). *Greenhouse Gas Reduction Mandate – Implementation and Effectiveness Risks*. Stockholm, Sweden.

Sweden 2. Swedish National Audit Office (Riksrevisionen) (2025). *The Climate Policy Framework — Central Government Work on Documentation and Evaluation*. RiR 2025:25. Stockholm, Sweden.

Tanzania

Tanzania 1. National Audit Office of Tanzania (2025). *Performance Audit of the Management of Carbon Trade in Tanzania*. Dar es Salaam, Tanzania.

Tanzania 2. National Audit Office of Tanzania (2024). *Implementation of the National Action Plan to Combat Desertification*. Dar es Salaam, Tanzania.

Tonga

Tonga Office of the Auditor General (2025). *Climate Change Adaptation Report*. Nuku'alofa, Tonga.

Tuvalu

Office of the Auditor General (2024). *Tuvalu Climate Change and Disaster Survival Fund Bill Audit*. Funafuti, Tuvalu.

United kingdom

United Kingdom 1. National Audit Office (2019). *Oil and Gas in the UK – Offshore Decommissioning*. HC 1870. London, United Kingdom. https://www.nao.org.uk/reports/oil-and-gas-in-the-uk-offshore-decommissioning/

United Kingdom 2. National Audit Office (2020). *Managing Flood Risk*. HC 2020. London, United Kingdom. https://www.nao.org.uk/press-releases/managing-flood-risk/

United Kingdom 3. National Audit Office (2020). *Achieving Net Zero*. HC 1035. London, United Kingdom.

United Kingdom 4. National Audit Office (2024). *Green Homes Grant Voucher Scheme*. HC 302. London, United Kingdom.

United Kingdom 5. National Audit Office (2025). *Department for Net Zero and Energy Security Overview*. London, United Kingdom.

United Kingdom 6. Rural Payments Agency (2025). *Annual Report and Accounts 2024-25* [including qualification of accounts for agri-environmental scheme irregularities]. London, United Kingdom. https://assets.publishing.service.gov.uk/media/6878eb94760bf6cedaf5be34/RPA_Annual_Report_and_Accounts_2024-25_FINAL.pdf

United Kingdom 7. Audit Scotland (2023). *How the Scottish Government is Set Up to Deliver Climate Change Goals*. Edinburgh, United Kingdom.

United Kingdom 8. Audit Wales (2024). *Climate-related Reports*. Cardiff, United Kingdom.

United Kingdom 9: National Audit Office (2024) Achieving environmental improvement and responding to climate change:enablers for success, London, United Kingdom.

United states

United States 1. Government Accountability Office (2025). *2025 Annual Report: Opportunities to Reduce Fragmentation, Overlap, and Duplication and Achieve an Additional One Hundred Billion Dollars or More in Future Financial Benefits*. GAO-

25-107604. Washington, DC. https://files.gao.gov/reports/GAO-25-107604/index.html

United States 2. Government Accountability Office (2024). *Climate Change: Options to Enhance the Resilience of Federally Funded Flood Risk Management Infrastructure*. Washington, DC.

United States 3. Government Accountability Office (2024). *Climate Resilience: Congressional Action Needed to Enhance Climate Economics Information and to Limit Federal Fiscal Exposure*. Washington, DC.

International organizations and other sources

International monetary fund

International Monetary Fund (2023). *IMF Fossil Fuel Subsidies Data: 2023 Update*. IMF Working Paper No. 2023/169. Washington, DC.

International renewable energy agency (IRENA)

International Renewable Energy Agency (IRENA) (2015). *Renewable Energy Roadmap for the Republic of Cyprus*. Abu Dhabi, United Arab Emirates.

Intergovernmental panel on climate change (IPCC)

Intergovernmental Panel on Climate Change (2021). *Climate Change 2021: The Physical Science Basis*. Contribution of Working Group I to the Sixth Assessment Report. Geneva, Switzerland.

Intergovernmental Panel on Climate Change (2022). *Climate Change 2022: Impacts, Adaptation and Vulnerability*. Contribution of Working Group II to the Sixth Assessment Report. Geneva, Switzerland.

Intergovernmental Panel on Climate Change (2022). *Climate Change 2022: Mitigation of Climate Change*. Contribution of Working Group III to the Sixth Assessment Report. Geneva, Switzerland.

United nations framework convention on climate change (UNFCCC)

United Nations Framework Convention on Climate Change (2015). *Paris Agreement*. Paris, France.

United Nations Framework Convention on Climate Change. *Nationally Determined Contributions (NDCs)*. Various countries and years. https://unfccc.int/NDCREG

International organization of supreme audit institutions (INTOSAI)

INTOSAI Working Group on Environmental Auditing (WGEA) (2022). *Auditing Climate Change: Guidance for Supreme Audit Institutions*. Oslo, Norway.

INTOSAI Working Group on Environmental Auditing (WGEA) (2019). *Global Cooperative Audit on Climate Change*. Various participating SAIs.

INTOSAI (2016). *ISSAI 100: Fundamental Principles of Public Sector Auditing*. Vienna, Austria.

INTOSAI (2013). *ISSAI 300: Performance Audit Principles*. Vienna, Austria.

INTOSAI Development Initiative/INTOSAI WGEA (2025). *Global Climate Adaptation Audits for a Resilient Future: Lessons and Recommendations from Supreme Audit Institutions*. Oslo, Norway.

World bank

World Bank (2021). *Climate Change Action Plan 2021-2025: Supporting Green, Resilient, and Inclusive Development*. Washington, DC.

World Bank (various years). *Climate Change Knowledge Portal*. https://climateknowledgeportal.worldbank.org/

Organisation for economic co-operation and development (OECD)

Organisation for Economic Co-operation and Development (2020). *Climate Finance Provided and Mobilised by Developed Countries*. Paris, France.

Organisation for Economic Co-operation and Development (2021). *Managing Climate Risks, Facing up to Losses and Damages*. Paris, France.

Organisation for Economic Co-operation and Development (2024). *Beyond green tagging: How can public budgeting support climate goals?,* Paris, France.

United nations environment programme (UNEP)

United Nations Environment Programme (2022). *Emissions Gap Report 2022: The Closing Window*. Nairobi, Kenya.

United Nations Environment Programme (2021). *Adaptation Gap Report 2021: The Gathering Storm*. Nairobi, Kenya.

United Nations Development Programme
One United Nations Plaza
New York, NY 10017

www.undp.org

© UNDP 2026