ENERGY TRANSITION

Practical Guide for Supreme Audit Institutions

INTOSAI

WGEI Working Group on Audit of Extractive Industries

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ENERGY TRANSITION

Practical Guide for Supreme Audit Institutions

Brasília, 2024

LIST OF ACRONYMS

COP28	28th Conference of the Parties
G20	Group of 20
GHG	Greenhouse Gases
INTOSAI	The International Organization of Supreme Audit Institutions
IPCC	Intergovernmental Panel on Climate Change
SAI	Supreme Audit Institutions
NDC	Nationally Determined Contribution
UN	The United Nations
SDGs	Sustainable Development Goals
SAI20	G20 Supreme Audit Institutions Engagement Group
SecexEnergia	TCU's Department of External Control for Energy and Communications
TCU	Brazilian Federal Court of Accounts
WGEI	Working Group on Audit of Extractive Industries

MESSAGE FROM TCU – PRESIDENT BRUNO DANTAS

It is with great satisfaction that I present the **Energy Transition Audit Guide**, developed by the Brazilian Federal Court of Accounts (TCU) in partnership with the Working Group on Extractive Industries (WGEI) of the International Organization of Supreme Audit Institutions (INTOSAI). Designed to support Supreme Audit Institutions (SAIs) with tools that enable a deeper look into the impacts of energy transition policies, this Guide complements other SAIs' initiatives in support of global efforts for climate change mitigation and adaptation.

Modern energy transition represents one of the greatest challenges humanities must face. Although traditional energy sources are still available, climate change imposes the inevitable need for transformation. In this scenario, SAIs play a crucial role, not only in evaluating public policies but also in encouraging reflections on the absence of necessary actions. The work of SAIs is fundamental to ensuring the effectiveness of the energy transitions and the efficient use of public resources, guaranteeing that the gradual shift from traditional to renewable energy promotes sustainable development.

In this context, the exchange of experiences and collaboration among SAIs are essential to improve the required tools to address the global challenges of energy transition and climate change. This audit Guide focuses on four main pillars — Governance, Just and Inclusive Transition, Financing, and Public Policies.

The Guide is a contribution, drawing from the concrete experience of TCU and several SAIs that voluntarily participated in an international benchmarking, to strengthen external oversight of energy transition policies. I am confident that, by using this Guide, SAIs will be able to audit public policies in their countries, ensuring that these policies meet the objectives of social justice, sustainability, and climate change mitigation, contributing to a better future for the current generation — leaving no one behind — and for generations to come.

Bruno Dantas
President
Federal Court of Accounts (TCU)
International Organization of Supreme Audit Institutions (INTOSAI)

INTRODUCTORY MESSAGE BY THE WGEI CHAIR

The energy transition is a crucial response to one of the most pressing challenges of our time—climate change. Worldwide, the adverse impacts of climate change on health, food and water security, infrastructure, human settlements and life itself continue to intensify. As part of the international strategy to combat these effects, many governments have committed to transition from reliance on fossil fuels to clean, renewable energy sources. This demands substantial policy shifts and actions.

Supreme Audit Institutions (SAIs) play a pivotal role in ensuring transparency, accountability, and good governance during this critical transition. By auditing governments' energy transition policies, SAIs help ensure that these strategies are effectively implemented and aligned with national and global climate commitments. Given the urgency of climate change, it is essential for SAIs to rapidly develop the capacity to audit these complex policies—through cooperation and knowledge sharing.

In this spirit, we present the Energy Transition: Practical Guide for Supreme Audit Institutions. This guide outlines the approach adopted by SAI Brazil in auditing the energy transition, offering insights into this emerging area. We invite SAIs worldwide to document their experiences as they too embark on the journey of auditing the energy transition. This knowledge will help enrich and refine the guide in future revisions. By learning together, we can strengthen the collective contribution of SAIs to the transition towards a just and equitable low-carbon future.

Edward Akol
Auditor General of Uganda and Chair of the Intosai Working Group
on Audit of Extractive Industries

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INTRODUCTION AND CONTEXT

Energy transition and climate crisis

The Global Agenda of the Sustainable Development Goals (SDGs), adopted in 2015, and the Paris Agreement, signed in 2016, highlight the importance of the energy transition in addressing the climate crisis. The energy transition seeks to gradually replace fossil fuels with clean and sustainable energy sources, playing a key role in reducing greenhouse gas (GHG) emissions and mitigating the impacts of climate change.

The Synthesis Report of the Intergovernmental Panel on Climate Change's (IPCC) Sixth Assessment highlights that human-induced climate change is causing major disruptions to natural systems and affecting the lives of billions of people[1]. The report also reinforces that the energy sector is the largest contributor to GHG emissions. Fossil fuels, which account for 78% of global final energy consumption, are the primary source of these emissions.

At the 28th Conference of the Parties (COP28) in November 2023, the urgency of accelerating the energy transition was further emphasized. The COP Presidencies Troika presented the „Roadmap to Mission 1.5°C", calling for a three-fold increase in renewable energy capacity and significant improvements in energy efficiency by 2030[2].

In parallel, in the face of the climate crisis, the Group of 20 (G20) seeks to play a pivotal role in the global discussions[3]. Brazil, as an international leader in renewable energy and as Chair of the G20 in 2024, has led initiatives to promote clean energy sources and support a fair and inclusive energy transition.

[1] Climate Change 2022: Impacts, Adaptation and Vulnerability. Working Group II Contribution to the IPCC Sixth Assessment Report. Climate Change 2022: Impacts, Adaptation and Vulnerability | Climate Change 2022: Impacts, Adaptation and Vulnerability (ipcc.ch).

[2] SDG Knowledge Hub. 2024 UN Climate Change Conference (UNFCCC COP 29). https://sdg.iisd.org/events/2024-un-climate-change-conference-unfccc-cop-29/.

[3] G20. Transições Energéticas. https://www.g20.org/pt-br/trilhas/trilha-de-sherpas/transicoes-energeticas.

This brief overview highlights the significant progress made in recent years on climate commitments. However, despite these advancements, substantial challenges remain in accelerating the global energy transition. Coherent and sustainable public policies are essential to shaping an economy that not only benefits society but also ensures the efficient management of environmental resources[4].

> **Supreme Audit Institutions (SAIs) play a key role in evaluating and guiding public policies. These institutions promote transparency, accountability, and good governance, contributing to policies that help reduce inequalities, poverty, hunger, and the impacts of climate change.**

The role of Supreme Audit Institutions (SAIs)

SAIs are independent and impartial public bodies that audit governments. One of the key objectives of these audits is to ensure that governments operate effectively, efficiently, ethically, and in accordance with the legal framework (ISSAI 100). In addition to overseeing public finances, SAIs are responsible for verifying legal compliance by public entities, aiming to promote efficiency in the use of public resources and reporting their findings directly to the relevant authorities[5].

> **The United Nations General Assembly recognizes the important role of supreme audit institutions in promoting the efficiency, transparency and responsibility in the public administration, which contributes to achieving national development objectives and priorities, as well as internationally agreed development goals (Resolutions 66/209 of 2011 and 69/228 of 2014).**

SAIs also play a crucial role in energy transition by auditing areas such as energy security, renewable energy integration, financing, and social sustainability. These efforts help create a reliable environment for investment and foster coherent policies.

In this context, the International Organization of Supreme Audit Institutions (INTOSAI) underscores the importance of energy for economic growth and social development[6]. The Brazilian Federal Court of Ac-

[4] Youtube. SAI20 - Summit 2024 | June 18th. Tribunal de Contas da União. SAI20 - Summit 2024 | June 18th - YouTube.

[5] Moonen, Gaston. Auditing energy transition issues – reconciling commitments and facts. Medium, 5 Abr. 2023. Auditing energy transition issues — reconciling commitments and facts | by European Court of Auditors | Medium.

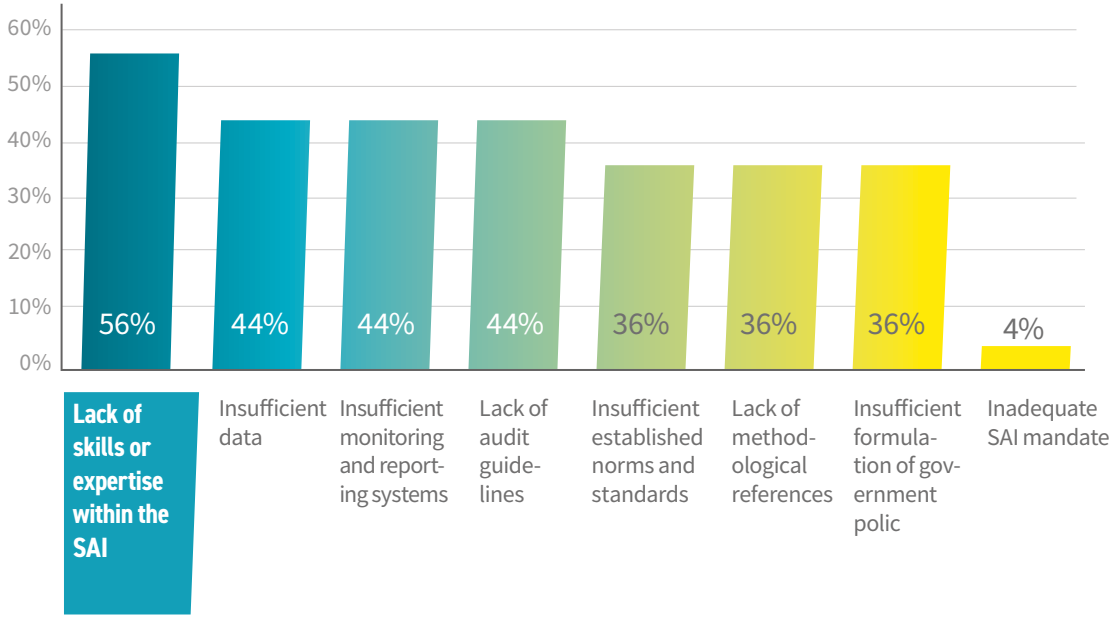
[6] Dantas, Bruno. Energy Transition in the Context of the Climate Crisis. INTOSAI Journal, 19 Jun. 2024. https://intosaijournal.org/energy-transition-in-the-context-of-the-climate-crisis/.

counts (TCU), as the current chair of INTOSAI, emphasizes the urgency of taking decisive action to limit global warming and facilitate transitions to low-carbon economies.

Faced with these challenges, SAIs from various countries have been actively discussing, in international forums, ways to overcome barriers and accelerate the energy transition process across different contexts.

The **Working Group on Audit of Extractive Industries (WGEI)** is one of INTOSAI key initiatives in supporting the audit community on energy transition issues. It focuses on auditing oil, natural gas, and solid minerals sectors, promoting governance and sustainability . In 2023-2024, WGEI, under the leadership of the TCU, conducted a survey involving 25 countries, identifying the main challenges SAIs face when auditing energy transition (see Graph 1).

Graph 1: Main challenges faced by SAIs in energy transition audits



Source: QR code to survey's results

Point your mobile device camera and access the research

[7]INTOSAI WGEI. INTOSAI Working Group on Audit of Extractive Industries. INTOSAI WGEI – INTOSAI Working Group on Audit of Extractive Industries (intosaicommunity.net).

Another important initiative is the **Working Group on Environmental Audit (WGEA)**, which focuses on expanding expertise in environmental auditing and improving environmental governance. Within WGEA, TCU leads the development and application of the Climate Scanner[8] initiative – a tool designed at promoting a global assessment of government actions related to climate change. The Climate Scanner will be able to provide valuable insights to guide public policies for the energy transition.

It is also worth mentioning the **G20 Engagement Group of Supreme Audit Institutions (SAI20)** under Brazil's presidency in 2024. This group focuses on sustainable energy transitions and economic, social, and environmental development. As part of the G20 Social Engagement Groups , this initiative presented recommendations for the 2024 G20 Summit that included measurable strategies, efficient use of resources, and promotion of transparent investments[10].

However, recent research indicates that SAIs continue to face significant challenges in the energy transition, particularly in terms of developing qualified teams and implementing specialized methodologies. There is a pressing need for target training and tools to bridge these gaps equipping SAIs with the skills required for effective oversight in this evolving sector.

In this context, in cooperation with the United Nations Development Programme (UNDP), the TCU conducted a survey on SAIs performance in Energy Transition auditing. This international benchmarking, conducted in September 2024, evaluated over 60 audit reports from dozens of countries. The study identified that several SAIs are adopting innovative methods in their audits, such as the use of big data, statistical modeling, and energy projections, in addition to relying on the expertise of specialists in areas related to energy transition.

TCU´s experience and performance (Brazil)

The TCU, in line with the UN 2030 Agenda, has been developing methodologies and audits to support the implementation of the Sustainable Development Goals (SDGs) . Aligned with the SDGs and the integration of renewable energy sources into the energy mix, the TCU has conducted assessments in recent years that address energy transition in a cross-cutting manner.

The 2023 National Energy Balance from the Brazilian Energy Research Office (EPE) , shows that Brazil's power sector features a low-carbon energy matrix. However, the country faces challenges in the

[8] Tribunal de Contas da União. ClimateScanner. ClimateScanner (tcu.gov.br).

[9] SAI 20. "Communiqué." Junho de 2024. Grupos de Engajamento (g20.org).

[10] Tribunal de Contas da União. Transição Energética e o Papel do Tribunal de Contas da União. https://sai20.org/wp-content/uploads/sites/10/2024/06/communique_portuguese.pdf.

transport and industrial sectors, where high GHG emissions remain a pressing concern. Therefore, the energy transition in Brazil is also seen as an opportunity to generate economic wealth and promote social inclusion.

In this context, the Brazilian Federal Court of Accounts decided to conduct an **Energy Transition Audit** in 2023. The objective was to evaluate how the Brazilian government is preparing to transition to a lower-carbon economy. Finalized in 2024 the audit assessed how the government is managing this shift, how the transition is being funded, the maturity of key related policies, and whether the transition is being carried out fairly and inclusively. This audit combined a risk-based approach with a framework designed to reflect the maturity of government actions.

Expected benefits

The 2023-2024 WGEI Energy Transition Survey revealed that SAIs are keen to expand their knowledge and share experiences related to energy transition audits. The survey sought to identify global and regional trends while assessing how each SAI is addressing the challenges posed by the energy transition.

The guide offers a comprehensive and adaptable approach for overseeing public policies, drawing on both Brazilian experience and insights from other institutions.

It facilitates the monitoring of the energy transition by promoting the integration of these policies.

The guide strengthens public policies, helping to achieve social, economic, and climate benefits by making them more balanced and sustainable.

The resulting audit enhances transparency regarding the maturity of government actions, highlighting areas for progress.

It encourages governments to improve their energy transition processes.

How was the guide prepared?

The guide's structure was developed through comprehensive research, drawing on literature and resources from both governmental and non-governmental organizations relevant to energy transition. This approach was further supported by the Brazilian audit planning and results documents.

The TCU drew inspiration from similar guides it had previously developed, as well as those created by other SAIs within INTOSAI. Expert opinions were incorporated to ensure the guide aligns with the current understanding of a fair and inclusive energy transition and to reflect its broader relevance beyond the audit community. The consulted organizations were chosen for their extensive knowledge and experience in energy transition and are acknowledged throughout this document.

International experiences also played a crucial role in shaping the guide's approach. The insights from the 2024 international benchmarking on energy transition, led by TCU, were integral to this effort.

This guide was prepared by the team from TCU's External Control Department for Energy and Communications (Secexenergia).

TCU headquarters
Source: institutional collection

How to use this Guide (intended audience)

This guide serves as a tool to support Supreme Audit Institutions (SAIs) in conducting audits related to the energy transition. It is designed to benefit various stakeholders.

Policy makers: it can support the design, planning, implementation and monitoring of government public policies aimed at energy transitions.

Organizations: it can be useful to the work of non-governmental organizations, both national and international, that work on the subject.

Society: can benefit from a better understanding of the role of SAIs and the functioning of effective public policies.

The approach proposed for this Guide is organized into **three sections**. The steps proposed within each section can be applied either together as part of a broader analysis or separately, depending on the focus of each audit: **Scope selection**; **Execution**; **Analysis and presentation of results**.

Additionally, the Guide highlights **best practices** identified throughout the audit process to promote the continuous improvement of SAIs' outcomes.

Users of the guide can refer to the guidelines to:

Assess Government Readiness for Energy Transition: This involves analyzing policies, regulations, institutional capacities to determine whether sufficient structures are in place to oversee and implement the energy transition.

Verify Fairness and Inclusiveness of Government Policies: This evaluation focuses on ensuring that all segments of society, particularly the most vulnerable, are adequately covered and benefit from the energy transition.

Examine Adequacy of Funding for Energy Transition: This includes assessing whether the financial resources allocated or planned by the government are sufficient, transparent, and effectively directed to meet the investment needs for the energy transition.

Analyze the Maturity of Government Actions on Specific Policies: This involves examining the development and implementation of public policies related to the energy transition, such as solar energy, wind energy, energy storage, carbon credits, and smart grids, among others.

AUDIT APPROACH

This section outlines the approach applied in the performance audit on energy transition conducted by the TCU.

The following step-by-step offers a comprehensive view of the government's readiness and maturity in managing the energy transition within its context, highlighting both strengths and areas for improvement. Therefore, the steps and procedures outlined in this guide can be fully replicated or tailored to the unique circumstances of each country.

The **audit approach** is divided into **3 topics**:

Audit Scope Selection

Audit Execution

Analysis and outcomes presentation

Dashboard with Themes

Audit Scope Selection	Audit Execution (Axes)	Analysis and outcomes presentation
Subject of audit	Governance	Score calculation for Axes
Canvas figure with each specific frame	Fair and inclusive energy transition	Analysis of items by Axes
SWOT Matrix - survey	Financing	Outcomes presentation
SWOT Matrix example - finished	Energy Transition thematic areas	
Risk inventory		
Risks mapped in the Brazilian audit		
Risk analysis and scoping		
Audit questions		

Captions (by symbols)

	**Recommendation / Explanation / Highlight / Tip**
	**Example**
	**Audit work paper**
	**Exploring international experiences (International Benchmarking)**
	**Specialists Contributions**

AUDIT SCOPE SELECTION

Audit Subject Matter

The first step for the audit team should be to gain a thorough understanding of the subject matter to be audited – in this case, **the governmental actions and structures involved in energy transition**.

The audit team must gather relevant information about the subject matter, to identify available criteria and data for the audit. They should also verify whether the required information or evidence can be efficiently obtained. Understanding the subject matter of the audit allows the audit team to identify risks and critical points and is indispensable for defining the audit's purpose, scope, and approach.

Recommendation: To gain a comprehensive overview of the energy transition, it is recommended to create an audit Canvas. This Canvas should be completed based on the audit team's prior knowledge of the topic and information gathered through research. Potential sources of information include:

- Relevant legislation on energy transition
- Documents from entities and programs connected to the theme
- Previous studies and academic research
- Specialized literature and articles
- Interviews with experts and involved managers

Tip: The Canvas consolidates information that can be used to draft the initial chapters of the audit report and provide a thorough overview of the audit subject matter.

Audit Canvas

Once the Canvas is developed, the next step is to identify the primary risks associated with the theme.

Recomendation: To effectively identify these risks, it is recommended to develop a SWOT Matrix. This matrix should address the strengths, weaknesses, opportunities, and threats related to the energy transition.

SWOT Matrix - survey

The SWOT Matrix can be developed in two stages of collaboration: internal and external.

Internal Stage: The matrix is developed based on the audit team's existing knowledge, guided by professional judgment, and by the information gathered from the Audit Canvas and the overall view of the audit subject.

External Stage: This stage involves gathering information from government agencies, civil society organizations, market experts and academics. During this process, only perceptions of weaknesses and threats related to the energy transition are collected.

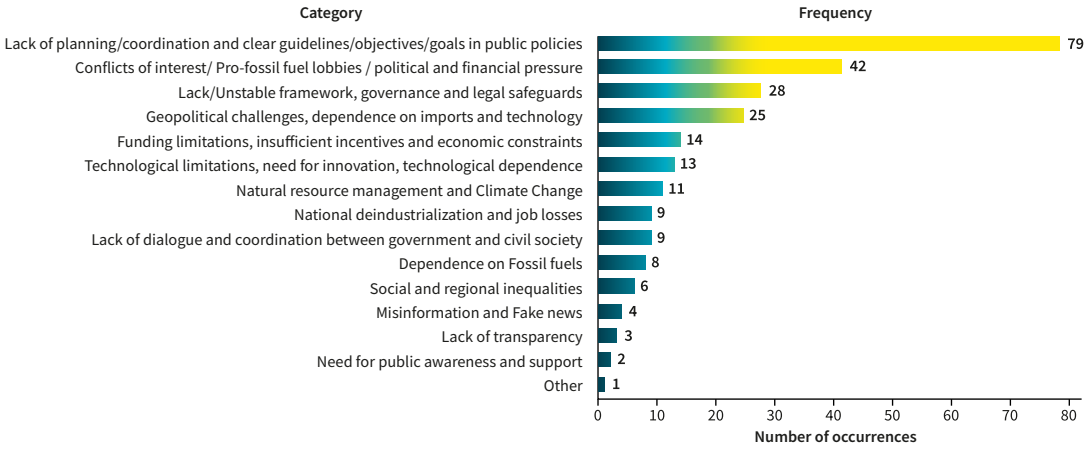
Recommendation: Use a template, questionnaire, or other available tools to collect contributions from stakeholders. The primary stakeholders identified during the Audit Canvas construction are good candidates for consultation at this stage.

Ensure wide distribution of the document to obtain a comprehensive range of opinions. Consider contacting the most relevant participants in advance.

Responses should be categorized to facilitate analysis. If the volume of responses is large, consider using AI tools to assist with categorization.

Exemple: In the audit conducted by TCU, the questionnaire was sent to 29 institutions. In total 18 responded, providing 254 contributions on threats or weaknesses related to the energy transition. The results were organized into 15 distinct categories (see Figure 1).

Figure 1: Example of results raised for weaknesses or threats by Category



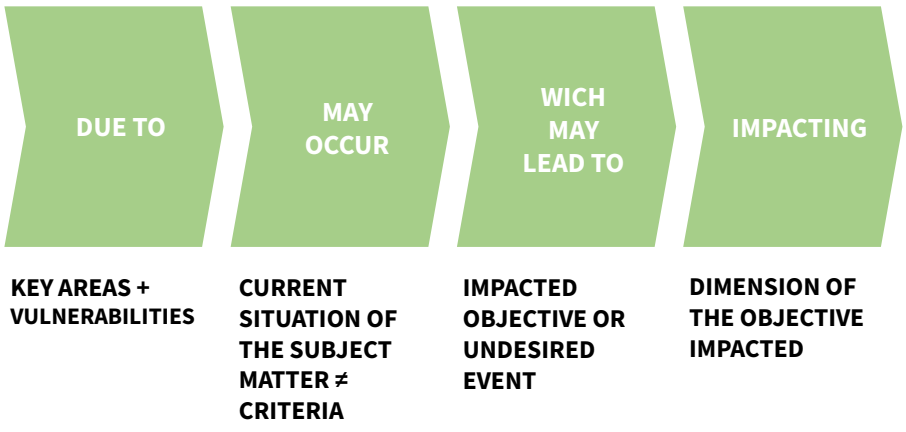
Source: Self-produced

Next, the SWOT Matrix should be completed by integrating the external contributions with the initial version prepared by the audit team.

Risk assessment

The next step in defining the audit scope is to develop a risk assessment based on the finalized SWOT Matrix and other information collected up to this point. We recommend following the structure outlined below to describe the risks (see Figure 2).

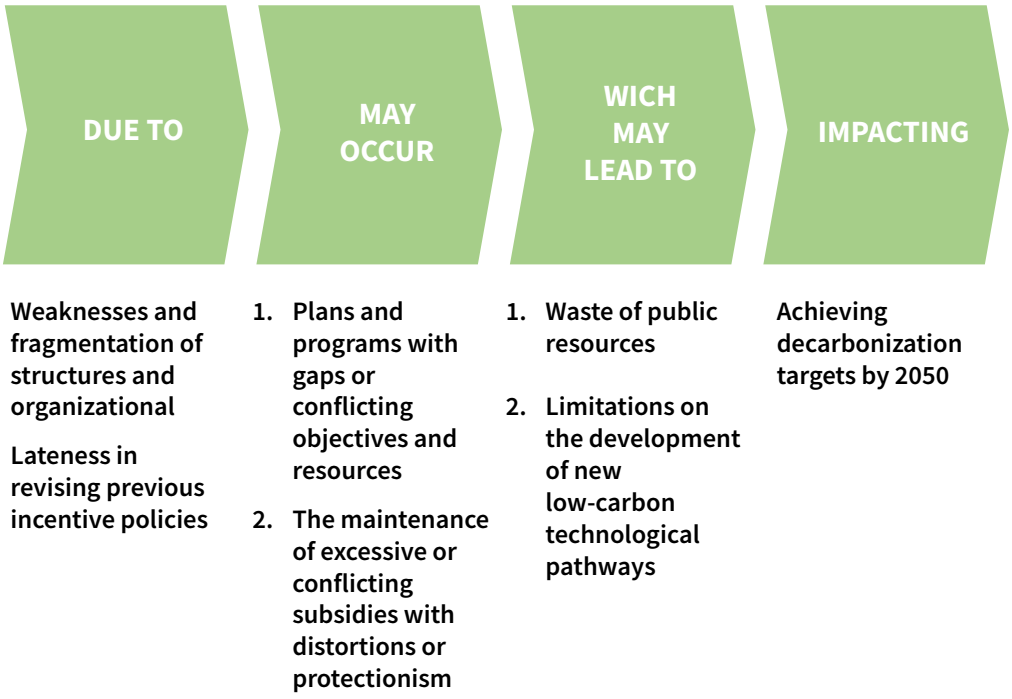
Figure 2: Structure for describing risks



Source: Self-produced

During this process, the **key areas** and **vulnerabilities** that could hinder or obstruct the project's operation or impact the achievement of its objectives are identified. These key areas may include **people, processes, products, and technologies**. Collectively, these key areas and their vulnerabilities define the causes of the risks (see Figure 3).

Figure 3: Risks identified in the Brazilian audit



Source: Self-produced

Click or scan it

To access the models for the Audit Canvas models, the Expert Consultation Form, the SWOT Matrix, and the Risk Inventory, please visit the page: sites.tcu.gov.br/transicao-energetica/index-en.html

Risk analysis and Scope Selection

This phase is essential for advancing the audit and focuses on identifying risks associated with the energy transition process. The success of the subsequent steps depends on the proper execution of the previous ones and the specifics of each local context.

Recommendation: Use the approach outlined in this guide, keeping in mind that it can be applied directly or tailored to fit the realities identified in earlier steps, depending on the decisions and expertise of the audit team.

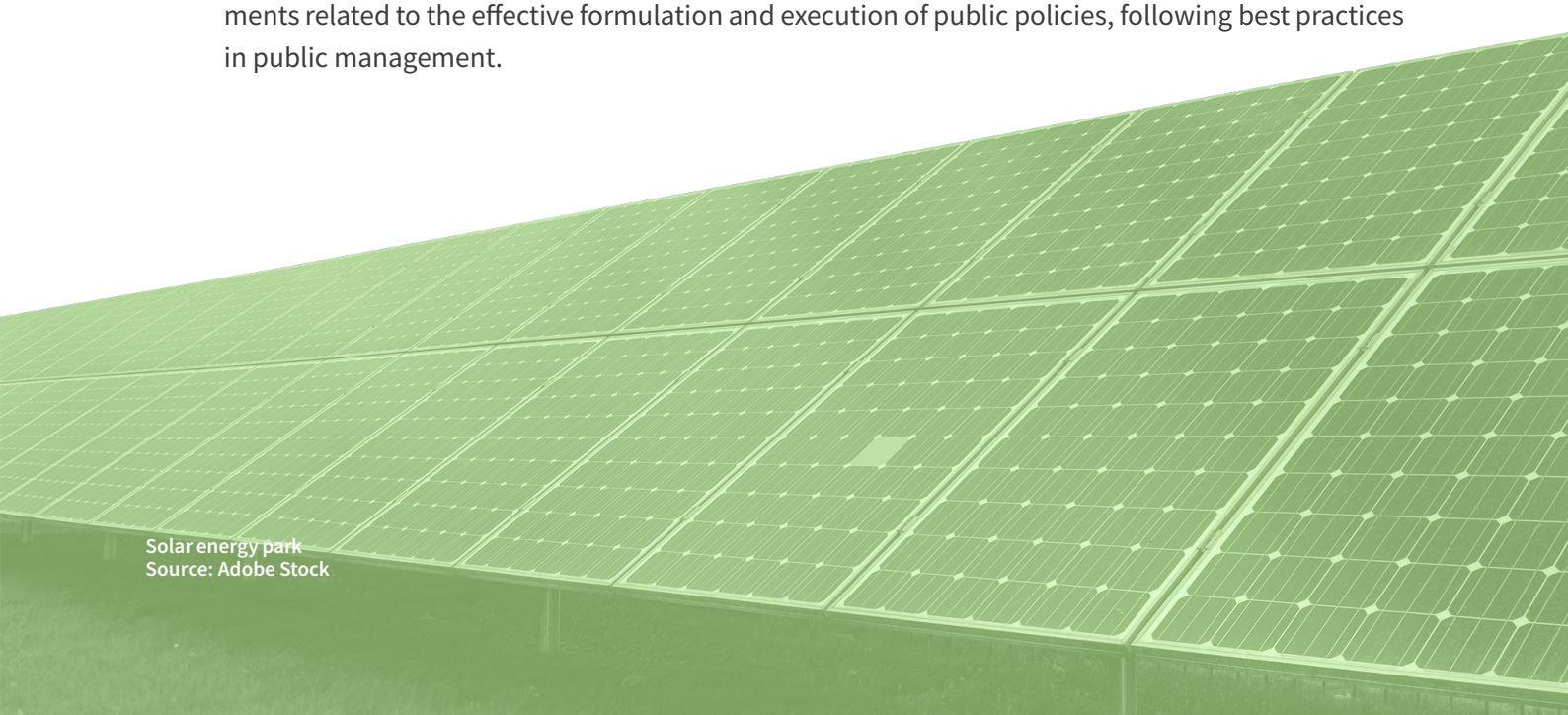
It is expected that, with the application of the previous steps, the audit team will identify the risks related to energy transition. However, the number of risks may vary, based on the specific characteristics of each country.

In the audit conducted by the TCU, **29 distinct risks** were identified. Given the number of risks, the audit team decided to conduct an audit with a broad scope rather than exploring each specific risk in depth. This approach allowed the scope to cover more foundational aspects without focusing on the details of each risk.

The identified risks have been organized into **four main Axes**:

1. Governance
2. Fair and Inclusive Energy Transition
3. Financing
4. Energy Transition Thematic Areas

During the execution phase, each Axis will be examined in detail. This involves analyzing key elements related to the effective formulation and execution of public policies, following best practices in public management.



Solar energy park
Source: Adobe Stock

It's important to highlight that the questions and analyses presented can be adapted to other Axes based on the outcomes of the Risk Assessment.

Explanation: The "Energy Transition Thematic Areas" Axis was established to encompass the analysis of various policy issues related to the energy transition agenda. Although these topics are components of the broader energy transition, they do not fully define it. The audit conducted in Brazil identified 11 distinct themes, though this list is not exhaustive. The approach should be applied separately to each of these themes. If multiple government policies or actions are identified for the same theme, each policy or action should be evaluated accordingly.

A lista de temas da transição energética pode variar e contemplar outros assuntos, a depender do contexto de cada local.

Recommendation: After selecting the themes, it may be challenging to identify the associated government policies due to dispersed information or unclear responsibilities within the government. To address this, consider additional steps such as:

- Conducting interviews with policymakers.
- Submitting formal requests to relevant bodies to obtain information on policies or actions related to the selected issues.

Exploring international experiences (International Benchmarking)

Colombia: Scope Selection with a Broader Focus

In the scope selection phase, Colombia's Supreme Audit Institution (CGR) emphasized the need for a broader approach in its report, "Evaluation of the Public Policy on Energy Transition (2012-2022)." Focusing exclusively on greenhouse gas (GHG) mitigation may limit the analysis, reducing the transition to merely a tool for combating climate change. To avoid this, it is essential to include other important dimensions, such as energy security and reliability, which directly impact economic development. This comprehensive approach allows the audit to provide a balanced perspective between environmental goals and economic growth.

Audit questions

Considering the four selected Axes, the following audit questions can be applied:

1. How prepared are public **governance structures** to implement the energy transition?
2. Are government actions effectively promoting a **fair and inclusive** energy transition?
3. Are the **financing** resources available or planned by the Federal Government sufficient to meet the investment needs for the energy transition?
4. How advanced is the government action in the following **thematic areas related to the energy transition agenda**? (Please list the selected thematic areas)

Topics of the Energy Transition agenda assessed in Brazil:

- ↘ Renewables in the Power Sector
- ↘ New Technologies in the Power Sector
- ↘ Energy Efficiency
- ↘ Carbon Capture, Use, and Storage
- ↘ Critical Minerals
- ↘ Low-emission Hydrogen
- ↘ Electric Mobility
- ↘ Biofuels
- ↘ Carbon Pricing
- ↘ Natural gas in the Energy Mix
- ↘ Nuclear Power

Highlight: It is important to understand that the scope selection – particularly the number of thematic areas defined in Axis 4 along with their associated public policies and government actions – will directly affect the resources required for the effective execution of audit procedures.

AUDIT EXECUTION

This section outlines the approach used to address the audit questions across the four selected Axes:

1. Governance
2. Fair and Inclusive Energy Transition
3. Financing
4. Energy Transition Thematic Areas

Each Axis is divided into smaller components that are analyzed in detail. The goal is to clarify the **required information for analysis** and the **expected outcomes**. Each SAI should choose appropriate audit procedures to effectively gather information, obtain sufficient evidence, and draw conclusions for each component.

Explanation: For Axis 4 of "Energy Transition Thematic Areas," the components should be analyzed separately for each public policy or government action identified within each thematic area. For example, if the thematic area is "carbon market" and the audit team identified three distinct policies or actions, the recommended components should be analyzed for each policy.

1. GOVERNANCE

The Governance Axis (G) will be analyzed based on the following components:

G1	Legal and regulatory framework
G2	Government structure
G3	Planning
G4	Risk management
G5	Coordination
G6	Monitoring and transparency

Specialists Contribution

GESEL Grupo de Estudos do Setor Elétrico UFRJ

Coordinating across different levels of government is crucial for aligning public policies and preventing fragmentation and inefficiencies that could hinder their implementation. By monitoring policy developments and auditing the effectiveness of these actions, SAIs can recommend new approaches to ensure that public policies remain consistent and sustainable over the long term. This also involves promoting the development of policies that extend beyond short-term cycles and respond to the technological and social changes brought about by the energy transition.

"The energy transition requires solid governance, capable of connecting different levels of government and guiding public policies that are not limited by short-term cycles, but that look to the future, focusing on sustainability."
— Nivalde Castro

G1 – Legal and regulatory framework

This section addresses the laws and regulations that shape the transition to renewable and sustainable energy sources. This includes sector-specific standards, such as those for energy, transportation, and industry, as well as documents and strategies that guide the implementation and management of the energy transition at both the national level and within specific sectors.

REQUIRED INFORMATION	EXPECTED OUTCOMES
Legal framework specific to the Energy Transition (ET) Legal framework for key sectoral **policies related** to ET **National planning instruments** and the key sectoral plans related to ET.	Identify whether a dedicated legal framework for ET exists and assess the integration of the main sectoral policies. Evaluate the alignment between regulations and planning instruments.

The audit team should verify whether there are specific laws and regulations in place that support the energy transition and ensure their alignment with the country's key planning documents. A clear and cohesive legal fra mework is critical for ensuring coordinated and effective government actions.

G2 – Government structure

The government structure outlines how institutions responsible for managing and implementing energy transition policies are organized, with clearly defined responsibilities across public entities. Ideally, a dedicated body should lead, coordinate, and mobilize other government agencies to ensure a cohesive and effective approach.

REQUIRED INFORMATION	EXPECTED OUTCOMES
Government structure to address energy transition (ET) issues. **Responsibilities** for formulation and implementation of energy transition actions clearly defined among public organizations. **Government body** with **leadership**, **direction, coordination** responsibilities, and authority to mobilize other government bodies.	Identify whether there is a governmental structure and clarity in the definition of responsibilities for the formulation and implementation of energy transition actions.

For energy transition actions to be effectively implemented, the roles and responsibilities of the involved bodies must be clearly defined. It is also crucial to have a dedicated body responsible for coordination, particularly given the involvement of multiple sectors. The audit team should assess whether these requirements are met.

G3 – Planning

It is essential to assess the planning efforts of a country or region aimed at transitioning to more sustainable energy sources over time. This plan involves analyzing trends, consulting experts, and setting goals and actions to be carried out over the years.

REQUIRED INFORMATION	EXPECTED OUTCOMES
Long-term strategy for the energy transition and the methodology used to develop it.	Determine if the cost-effectiveness of governmental actions was assessed, including analysis of alternative interventions.
Nationally Determined Contribution **(NDC)** under the Paris Agreement **(if applicable)**.	Identify whether a long-term strategy for the energy transition is in place.
Planning instruments.	
Actions related to **SDG 7 (if applicable)** (Ensure reliable, sustainable, modern, and affordable access to energy for all).	Verify the alignment of this strategy and planning instruments with NDC and SDG 7 goals.

The audit team should verify whether there is a long-term energy transition strategy in place and analyze the methodology used to define it - the absence of such a strategy indicates an opportunity for improvement. Additionally, the audit team should ensure that this strategy aligns with the NDC targets and SDG 7, if applicable.

Exemple: Some questions can help the analysis of the long-term strategy:

- Was the strategy based on evidence?
- Were alternative approaches considered?
- Are there estimates of cost-effectiveness?

G4 – Risk management

Effective risk management is crucial for a successful energy transition. It involves identifying and analyzing potential challenges using data and studies. It's essential to verify if the country's key planning tools and sector policies account for risks that could derail the transition to a more sustainable energy system and outline actions for addressing or mitigating these risks.

REQUIRED INFORMATION	EXPECTED OUTCOMES
Risk mapping for the energy transition. **Evidence** used to identify these risks. Key **planning** tools and sector policies related to the energy transition.	Determine if there is evidence-based risk assessment for the energy transition and whether these risks have been incorporated into the key planning instruments and sector policies related to the transition.

The absence of evidence-based risk mapping for the energy transition presents an opportunity for improvement. It is also crucial to verify whether sector plans and policies consider these risks or propose actions for their mitigation.

Risk management
Source: Adobe Stock

G5 – Coordination

Achieving a successful energy transition requires mechanisms that foster collaboration across public agencies. This includes facilitating both horizontal and vertical coordination to align federal, state, and municipal government actions with the implementation of energy transition policies.

REQUIRED INFORMATION	EXPECTED OUTCOMES
Institutional mechanisms for **horizontal coordination** among relevant governmental bodies involved in the energy transition. Institutional arrangements for **vertical coordination** (intergovernmental).	Determine if there are institutional mechanisms that enable both horizontal and vertical coordination of energy transition actions.

Horizontal coordination occurs within the same governmental level, while vertical coordination involves different levels of government (federal, state, municipal).

G6 - Monitoring and transparency

Monitoring mechanisms track the progress of energy transition actions, assessing their efficiency, effectiveness, and impact. The data collected helps to verify whether goals are being met. In parallel, transparency mechanisms allow the public to access and follow information about these actions and outcomes, ensuring greater clarity and public engagement.

REQUIRED INFORMATION	EXPECTED OUTCOMES
Existing **monitoring mechanisms.** Monitoring **data.** **Transparency** mechanisms that enable the public to track energy transition actions.	Identify if there are reliable monitoring and transparency mechanisms that allow the public to track energy transition actions.

Indicators for energy transition progress should be defined, with responsibility for their measurement and updating established by laws, regulations, or guidelines. There should also be mechanisms for sharing this information with the public through easily accessible channels.

Monitoring room
Source: Adobe Stock

2. FAIR AND INCLUSIVE ENERGY TRANSITION

The fair and inclusive energy transition Axis (J) will be analyzed through the following components:

J1	Inclusion
J2	Tackling energy poverty
J3	Socio-economic development

Specialists Contribution

CBC CENTRO BRASIL NO CLIMA

Social justice must be a central aspect at all stages of the energy transition, from planning to implementation. A just transition cannot be treated merely as an afterthought but as a cross-cutting goal in all identified actions. To achieve this, it is essential to first recognize and map the main inequalities operating within the energy system to plan an energy transition that leaves no one behind and is premised on eradicating poverty and energy exclusion, considering access, cost, and quality dimensions. Additionally, energy transition planning should aim to distribute costs and impacts fairly, ensuring that those already disadvantaged are not further penalized. Regarding the identified impacts, it is crucial to develop appropriate and fair restorative and compensatory measures. Finally, inclusion must go beyond symbolism: it must be procedural, with these populations being heard and having real influence in decision-making.

"Social justice is a fundamental principle of the energy transition, ensuring that vulnerable communities have meaningful participation in all stages of public policy. The success of these policies depends on how these voices are truly incorporated into the decision-making process."

— Raiana Schirmer Soares

Tip: To analyze this component, the team can be guided by the following sub-questions:

- Do the policies ensure universal access to energy and eradicate energy poverty?
- Are they aligned with sustainable development and the Sustainable Development Goals (SDGs)?
- Were the affected parties included in the process, respecting the International Labour Organization's Convention No. 169 and the right to free, prior, and informed consultation?
- Do they map out the socio-environmental and socioeconomic impacts?
- Do they provide for fair compensatory and restorative measures?

J1 – Inclusion

Ensuring a fair energy transition requires identifying the most vulnerable groups and actively involving them in decision-making processes when developing and implementing strategies and policies. It is equally important to adopt measures that guarantee equitable benefits for all groups while minimizing any negative impacts, thus promoting justice and inclusion at every stage.

REQUIRED INFORMATION	EXPECTED OUTCOMES
Actions aimed at identifying **vulnerable groups**. Mechanisms for **including affected communities and vulnerable populations** in decision-making processes during the design and implementation of strategies, policies, and plans. Mechanisms that integrate **equity-focused measures** to minimize harm and ensure fair benefits.	VEvaluate if vulnerable groups affected by the energy transition have been identified and if they are involved in the decision-making process. Determine whether strategies, policies, and plans for the energy transition incorporate equitable measures.

The first step is to assess whether actions have been taken to identify vulnerable groups. The absence of such actions should be seen as an area for improvement in government action. It is also essential to verify whether mechanisms are in place to include these groups in decisions related to strategies, plans, and actions regarding the energy transition. Sectoral plans and long-term strategies can provide valuable insights for this analysis.

J2 – Tackling energy poverty

It is crucial to ensure that vulnerable communities have access to clean electricity and sustainable fuels. Mechanisms must be established to provide affordable clean energy that these groups can use in their everyday lives. These actions are key to improving quality of life and effectively combating energy poverty, in alignment with SDG 7.

REQUIRED INFORMATION	EXPECTED OUTCOMES
Actions promoting access to **clean electricity**. Actions promoting access to **clean fuels** for the most vulnerable communities. Mechanisms ensuring **affordable access** to clean energy for cooking, heating, and lighting (e.g., cooking gas).	Verify that clean energy policies and development plans include actions promoting access to clean electricity and clean fuels for vulnerable communities. Identify any legal and regulatory mechanisms that ensure energy prices remain affordable guaranteeing access for all.

The audit team should examine whether sectoral plans and programs include actions to achieve these goals, or if there are specific plans and programs dedicated to this purpose.

J3 – Socioeconomic development

It is important to have policies and plans that promote the socioeconomic development of workers and communities, including specific strategies to generate jobs and income. These policies should include guidelines that aim to reduce social and regional inequalities, ensuring that all regions benefit from economic growth and available opportunities.

REQUIRED INFORMATION	EXPECTED OUTCOMES
Policies and plans addressing the **socioeconomic development of regions, workers, and communities**. Policies and plans that include **employment and income generation strategies**. Guidelines focused on **reducing regional inequalities**.	Identify if policies and plans address the socioeconomic development of regions, workers, and communities reliant on fossil fuels. Highlight whether policies and plans related to new technologies development and energy sources include strategies for generating employment and income. Verify if policies related to energy transition actions contain guidelines aimed at reducing regional and social inequalities.

Highlight: Socioeconomic development is one of the key objectives of the energy transition, as it promotes social well-being. The audit team should ensure that plans, policies, and strategies set clear goals for generating income, increasing and maintaining jobs, and reducing both regional and social inequalities.

3. FINANCING

The Financing Axis (F) can be analyzed based on three components:

F1	Investment needs assessment
F2	Follow-up
F3	Transparency

Specialists Contribution

transição energética

Subsidies should address market failures, not regulatory failures. For this to happen, it is essential to improve the regulatory framework, allowing investments to flow without excessive dependence on subsidies. By auditing and recommending corrections to regulatory policies, SAIs help reduce risks for investors, promoting a stable and transparent environment that attracts private capital. Furthermore, the integrated use of environmental economy instruments, such as regulation, taxes, and market mechanisms, should ensure the efficient allocation of public and private resources, meeting environmental, social, and economic criteria.

"The challenge of the energy transition goes beyond technical and financial issues; it requires an efficient regulatory framework. Before thinking about subsidies, it is crucial that this framework is effective in attracting investments and developing a green and sustainable economy, leveraging the natural resources and strengths of each country."

— Philipp D. Hauser

F1 – Investment needs assessment

The government must map out investment needs across different areas and identify key funding sources to ensure an effective energy transition. These resources may come from public, private, national, or international sources.

REQUIRED INFORMATION	EXPECTED OUTCOMES
Mapping of **investment needs for the energy transition.** Mapping of **key funding sources** necessary for ET.	Verify whether the government has quantified the investment needs and mapped the main sources of funding required to achieve the energy transition goals.

Tip: Budget laws and sectoral strategic plans are valuable sources of information for analyzing this component.

F2 – Follow-Up

The government should have tools to monitor existing funding systems. This helps to identify opportunities for improvement, update trading methods and identify areas where investments are lacking.

REQUIRED INFORMATION	EXPECTED OUTCOMES
Government **monitoring mechanisms** for financing.	Identify whether the government monitors the financing system for energy transition spending.

Tip:Government budget monitoring systems are valuable tools to assess the oversight of public financing for the energy transition.

F3 – Transparency

Transparency in spending related to energy transition financing ensures that society can track where resources are coming from and how much is being invested, thus strengthening social oversight over government actions.

REQUIRED INFORMATION	EXPECTED OUTCOMES
Transparency mechanisms for ET funding.	Assess whether the government has transparency mechanisms in place regarding energy transition financing.

Highlight: The audit team may face challenges in gathering information related to government monitoring and transparency of private financing (components F2 and F3). To overcome these difficulties, consulting with specialized entities may be necessary.

Refer to the "Good practices and lessons learned" chapter, at the end of this guide, for relevant insights from Brazil's experience in analyzing energy transition financing.

4. ENERGY TRANSITION THEMATIC AREAS

For the Energy Transition thematic areas Axis (T), we propose organizing the analysis into four key components:

T1	Government Agenda development
T2	Institutionalization
T3	Implementation
T4	Assessment and transparency

Each thematic area can include multiple associated policies. In these cases, we suggest analyzing each policy individually and applying the four components to each one.

Exemple: When examining the theme “Renewable Energy,” if we identify policies for Solar Energy (SE) and Wind Energy (WE), we will assess 4 components for Solar Energy T1(SE), T2(SE), T3(SE) and T4(SE) and 4 for Wind Energy T1(WE), T2(WE), T3(WE) and T4(WE).

The section “Analysis and outcomes presentation” will provide concrete examples of how to implement these components across various government policies or actions within the same theme. Additionally, it offers a strategy for consolidating outcomes by theme, regardless of the number of policies or actions involved.

Specialists Contribution

GESEL
Grupo de Estudos do Setor Elétrico
UFRJ

Emerging technologies, such as electrification, hydrogen, batteries, and pumped hydroelectric plants can accelerate the energy transition. However, continuous monitoring of technological innovations is crucial to ensure that these solutions are adopted sustainably and aligned with long-term climate goals. By auditing these technologies, SAIs can assess if the government is conducting adequate analyses, including public consultations and impact studies. Furthermore, they can ensure if the adoption of these technologies benefits society.

“The audit of emerging technologies is essential to ensure their adoption is both sustainable and aligned with long-term commitments. The role of SAIs is to monitor and question the government, ensuring that these innovations bring real benefits to society.”

— Nivalde Castro

T1 – Government Agenda development

This component focuses on identifying priority issues in political discussions and how they are selected and prioritized by governments. It involves understanding which topics resonate with the public and policymakers, influenced by factors like public opinion and media influence.

REQUIRED INFORMATION	EXPECTED OUTCOMES
Public policy agenda and its **development process.**	Identify whether the issue is a government priority and is currently under discussion. Assess the level of public participation in formulating and selecting government actions.

To evaluate this component, it's essential to analyze the government agenda related to the policy and how it was established. Sources like multiannual budget plans, management strategies, and consultations with central and sectoral bodies can be useful. It is essential to ensure that public participation is a key part of the agenda-setting process.

T2 – Institutionalization

A public policy becomes institutionalized when it is formalized. Clear objectives and measurable targets are crucial, as they guide the monitoring process and ensure effective implementation of a public policy.

REQUIRED INFORMATION	EXPECTED OUTCOMES
Normative acts that officialize the public policy. Defined objectives and goals and corresponding monitoring indicators.	Confirm that the public policy is established through a normative act. Verify that the objectives are specific, measurable, achievable, realistic, and timely (SMART) for implementation and expected outcomes. Identify whether clear targets have been set for each indicator.

Exemple: To guide the analysis of this component, the audit team may consider the following questions:

- Is the policy formalized through a normative act?
- Are the objectives and goals clearly defined?
- Are the goals realistic?
- Are the objectives supported by evidence or a clear framework?
- Are indicators established for each goal?

Specialists Contribution

transição energética

The energy transition depends on the continuous development of technologies for generating and using renewable resources, as well as the electrification of transportation and industries. Biomass, currently used as an energy source, can replace fossil inputs in chemical and metallurgical industries, opening new strategies for carbon management and sequestration. It is essential that SAIs audit public policies that impact these production chains to ensure coherent incentives, avoiding disruptions and discontinuity in investments. This promotes economic growth, job creation, and the competitiveness of economies.

"The energy transition is a process of creative destruction with great benefits for society. However, its success depends on a favorable environment for innovation and the expansion of new solutions, and SAIs must ensure that public policies facilitate this process."

— Philipp D. Hauser

T3 – Implementation

A successful policy implementation requires a clear definition of responsibilities for execution and a associated risks map. Reports demonstrating how the policy is being implemented are essential for ensuring alignment with intended outcomes and facilitating necessary adjustments.

INFORMAÇÕES NECESSÁRIAS	RESULTADO ESPERADO DA ANÁLISE
Responsibilities and risks related to implementation. Data on policy application (implementation reports). Results from **effectiveness evaluations**.	Identify whether implementation responsibilities are well defined. Identify and address key risks to implementation. Assess whether short-term goals and objectives are being met (effectiveness).

The audit team should ensure that responsibilities are explicitly defined, preferably in normative acts, and that significant risks have been identified, along with proposals to address or mitigate the most significant ones. Additionally, verify whether the policy's short-term objectives are being achieved

Specialists Contribution

CBC CENTRO BRASIL NO CLIMA

Technological innovations have the potential to make energy transition more accessible and inclusive, but the positive impact of these technologies depends on how they are implemented. It is essential to ensure that access to renewable technologies, such as solar energy and hybrid systems with batteries, is guaranteed for vulnerable communities. To avoid increasing disparities, it is crucial for SAIs and other stakeholders to closely monitor the adoption of these technologies, ensuring they are distributed fairly and adapted to local needs.

"Although technological innovations are powerful tools for the transition, unequal access continues to place the poorest groups at disadvantage. Continuously monitoring the impact of these public policies on the most vulnerable communities is essential to ensure that they effectively reach these groups, promoting a fair distribution of the benefits and costs of the transition."

— Raiana Schirmer Soares

T4 – Assessment and transparency

Promoting transparency and effectiveness requires detailed information on the policy's performance, including evaluation reports and monitoring plans that demonstrate operational effectiveness. Public reports allow citizens to engage and assess the impact of implemented actions.

INFORMAÇÕES NECESSÁRIAS	RESULTADO ESPERADO DA ANÁLISE
Data on **policy performance** (evaluation reports, monitoring plans). **Publicizing** policy outcomes.	Verify that policy indicators are actively measured and monitored. Assess whether the policy has produced the desired effects. Ensure performance information is publicly available and accessible to citizens.

The audit team should ensure that the policy undergoes regular evaluation through indicator monitoring and analysis of expected effects. Control groups can be used for assessing if the policy implementation is changing the reality.

Additionally, make sure that evaluation outcomes are accessible to the public.

ANALYSIS AND PRESENTATION OF OUTCOMES

This section encompasses the approach used to analyze, interpret and present the evaluation results conducted for each component of the audit questions.

This assessment will result in a score, following the scale described below.

Assessment score scale:

0 – Not implemented – No public policy in place.

1 – Low implementation – Only the initial stages of the public policy cycle have been completed.

2 – Partial implementation– Several stages of the public policy cycle have been completed, but progress is needed on some points.

3 – High implementation – Most of the stages of the public policy cycle have been completed, with minimal room for improvement.

Recommendation: Include a detailed assessment of each item in the report's appendices, especially since the results related to the Energy Transition themes contain a large volume of information. In the report, highlight the results using the suggested charts and tables.

Each item should be evaluated based solely on integer values from 0 to 3, as outlined in the classification above.

Highlight: The assignment of scores to items in each component **involves significant skepticism and professional judgment (ISSAI 3000)**. Therefore, this analysis must be based on solid evidence, collected during the information-gathering phase, as described in the Audit Execution section of this guide

SCORE CALCULATION BY AXIS

Governance, Fair and inclusive transition and Financing (Axes 1, 2, and 3)

To determine the overall score for each component on Axes 1, 2, or 3, calculate the **simple average** of the scores assigned to the corresponding analysis item related to that component, rounding to one decimal place.

Finally, obtain the final score for each Axis by calculating the average of the scores of all its components.

Refer to Chart 1 below for a **hypothetical assessment of Axes 1, 2 and 3**.

Chart 1: Example assessment for Axes 1, 2 and 3

COMPONENT	ITEM	ASSESSMENT SCORE	Assessment score aggregated by **component**
1	1.1	3	2,5
	1.2	2	
2	2.1	2	2
3	3.1	2	1,7
	3.2	1	
	3.3	1	
AXIS SCORE			2,1

Source: Self-produced

Energy transition thematic areas (Axis 4)

For the Energy Transition thematic areas (Axis 4), it is likely that each thematic area identified will include one or more government policies or actions.

In this case, it is necessary to evaluate **each item** separately, for **every government policy or action**.

Chart 2 provides a **hypothetical assessment for Axis 4,** considering a specific thematic area with three different government policies or actions. This chart illustrates how scores are calculated and aggregated for each **theme, policy, component and item**.

Chart 2: Example assessment for Axis 4

COMPONENT	**ITEM**	Assessment score of **policy or action A**	Assessment score of **policy or action B**	Assessment score of **policy or action C**	Assessment score aggregated by **item**	Assessment score aggregated by **component**
1	1.1	2	2	3	2,3	2,7
	1.2	3	3	3	3	
2	2.1	2	1	3	2	2
3	3.1	0	1	3	1,3	1,7
	3.2	0	2	0	0,7	
	3.3	1	1	0	0,7	
Assessment score aggregated by **policy or action** **Thematic area score**			1,3	1,7	2	**1,7**

Source: Self-produced

To add up the result and calculate the final score for each policy, component and theme, follow these steps:

1. Calculate the simple average of the scores assigned to all items **in the same specific policy or action** (assessment score aggregated by **policy or action**).
2. Calculate the simple average of the scores assigned to each item **for all related policies and actions** (assessment score aggregated by item).
3. Calculate the simple average of item scores in **each component** (assessment score aggregated by **component**).
4. Calculate the simple average of the aggregate scores of all policies and actions obtained in step 1 (**thematic area** score).

Highlight: The aggregate scores of items and components are not used to determine the final score for the thematic area. Instead, a simple average of the policies or actions is sufficient. However, these scores are fundamental for a comprehensive analysis of the thematic area. The highlighted cell in the bottom right corner of Chart 2 illustrates the final aggregate value by theme

To properly interpret the overall scores, it is necessary to follow a specific classification system because we are dealing with continuous variables.

Thus, **the recommended** interpretation is presented in Chart 3 below.

Chart 3: Overall Scores

OVERALL SCORE RANGE	CLASSIFICATION
From 0 to 0.4	Not implemented
From 0.5 to 1.4	Low implementation
From 1.5 to 2.4	Partial implementation
From 2.5 to 3	High implementation

Source: Self-produced

ANALYSIS BY AXIS

The following step describes the **proposed analysis items for each Axis**. This guide offers a practical approach to assessing the energy transition in a transversal manner, and the proposed items can be adapted as needed.

Highlight: During the audit execution, it may be identified that an item or an entire component is not relevant to the context of a particular country or due to unforeseen circumstances, they no longer fit into the audit planning. In such cases, it is the responsibility of the audit team to make the necessary adjustments.

1. Governance

In this Axis, the audit aims to ensure that government commitments on climate are translated into **concrete actions** related to energy transition and in line with international best practices, promoting the **transparency and accountability** needed to meet global challenges (see Chart 4).

Chart 4: Governance

COMPONENT	ITEM
G1. Legal and regulatory framework	**Existence of legal framework** A legal framework for the Energy Transition (ET) is in place.
	A legal framework for the Energy Transition (ET) is in place. There is a legal framework for the main sectoral policies that involve ET.
	Existence of a sectoral legal framework ET legislation provides for the integration of sectoral policies and government planning instruments.

G2. Government structure	**Existence of a government structure**
	A government structure is in place to deal with the ET.
	Well-defined responsibilities
G3. Planning	**Cost-Effectiveness** The selection of government actions considered cost-effectiveness and analyzed viable alternatives for intervention.
	Long-term strategy There is a long-term strategy for the ET.
	Alignment with NDC The long-term strategy is aligned with NDC.
	Synergies with the SDGs The planning instruments are aligned with SDG 7 (ensuring reliable, sustainable, modern and affordable access to energy for all).
G4. Risk management	**Risk mapping** There is a risk mapping for the ET.
	Evidence of risks The risk identification is largely evidence-based.
	Risks in key planning instruments and sectoral policies The planning instruments and the national ET policies incorporate the identified risks

G5. Coordination	**Horizontal coordination mechanisms** There are institutional mechanisms (commissions, councils, committees, systems, processes and protocols between sectors, etc.), to allow horizontal coordination among intergovernmental bodies related to ET.
	Dynamics of interaction Institutional mechanisms of horizontal coordination have a working dynamic that allows regular interaction of members.
	Vertical coordination mechanisms There are institutional mechanisms (commissions, councils, committees, systems, mechanisms for joint formulation and implementation of policies at all levels of government – federal, state, municipal, etc.) that allow vertical coordination.
G6. Monitoring and transparency	**Monitoring** There are monitoring mechanisms in place.
	Regularity Data is provided, and monitoring is carried out regularly.
	Transparency There are transparent mechanisms that allow society to monitor actions related to ET in accessible formats and language.

Source: Self-produced

Exploring international experiences (international benchmarking)

United Kingdom: Risks in the Net Zero Emissions Target

SAI United Kingdom, in its report "Achieving Net Zero," highlighted that the goal of reaching zero emissions by 2050 requires coordinated efforts among government agencies. However, the audit identified a lack of prioritization by some departments and a deficiency in specialized skills, posing significant risks to the success of the strategy. The work of SAIs can monitor these risks to ensure the effective implementation of public policy goals.

India: Energy Governance and Sectoral Audits

India's Supreme Audit Institution conducted key audits in the energy sector, including energy management in railways and the operations of the state energy efficiency agency. These audits highlighted opportunities for improvement in the energy sector governance and underscored the importance of energy efficiency as a critical component of the transition to renewable sources.

South Africa: Governance Challenges in the Energy Sector

SAI South Africa identified critical challenges in the energy sector, including the lack of an approved energy transition plan and limited governance. The audits focused on compliance by independent power producers with regulatory requirements, assessing adherence to minimum regulatory standards. This emphasis on regulatory compliance is vital for strengthening governance in the sector and enabling the transition to renewable energies.

Costa Rica: Regulatory Fragmentation in the Energy Sector

SAI Costa Rica, in its report "Challenges of the Transition from the Perspective of Public Finances," highlighted that regulatory fragmentation in the Energy Subsector has been an obstacle to effective energy transition. The absence of a systemic design and the complexity of the legal framework hinder the implementation of consistent policies. The audit recommends improving regulatory governance to ensure efficient coordination among key players in the energy sector.

2. Fair and inclusive energy transition

SAIs have a key role to play in ensuring that energy transition policies and strategies are aligned with principles of equity and social justice, promoting **reduction of regional and social inequalities**. The items assessed in this Axis seek to identify the presence of these aspects in government actions (see. Chart 5).

Chart 5: Fair and inclusive energy transition

COMPONENT	ITEM
J1. Inclusion	**Identifying the most vulnerable groups** There are strategies for identifying the groups most vulnerable to the impacts of changes related to Energy Transition (ET).
	Inclusion in decision-making There are mechanisms for including affected communities and vulnerable populations in the decision-making process on strategies, policies and plans related to ET.
	Equitable perspective There are mechanisms for including affected communities and vulnerable populations in the decision-making process on strategies, policies and plans related to ET.
J2. Tackling energy poverty	**Access to clean energy** ET policies and plans include actions that promote access to clean energy to the most vulnerable communities.
	Primary access to clean fuels ET policies and plans contain actions that promote access to clean fuels for the most vulnerable communities.
	Affordable prices There are legal or regulatory mechanisms that provide access to clean energy at affordable prices, for cooking, heating and lighting.

J3. Socio-economic development	**Concern for workers and communities dependent on fossil fuels** There are policies and plans that address the socio-economic development of workers and communities that depend on fossil fuels.
	Employment and income Policies and plans for developing new technologies and energy sources include guidelines and strategies aimed at creating employment opportunities and boosting income.
	Reduction of regional inequalities The ET policies contain guidelines to reduce regional and social inequalities.

Source: Self-produced

Exploring international experiences (international benchmarking)

Colombia: Socioeconomic Impacts of Decreased Coal Exports

In Colombia, the Supreme Audit Institution identified a lack of objectivity in the gradual reduction plan for coal exports in its audit "Evaluation of the Public Policy on Energy Transition (2012-2022)". This policy may generate adverse socioeconomic effects on communities dependent on coal mining. The audit emphasized the importance of ensuring that the government mitigates these impacts and implements appropriate support mechanisms, ensuring that policies do not harm the most vulnerable populations.

Indonesia: Assessment of Social Impacts of the Energy Transition

In its audits, SAI Indonesia used the "energy trilemma"—security, equity, and sustainability—to assess the social and economic impacts of transitioning from traditional energy sources. It was observed that the transition could lead to increased electricity costs, negatively impacting vulnerable communities. Additionally, the audit analyzed infrastructure policies for electric vehicles and their impact on low-income populations, seeking to ensure that public policies are designed to protect these communities.

3. Financing

By verifying whether governments correctly identify **investment needs and financing sources** to achieve climate goals, SAIs strengthen public confidence in these resources management. The items listed below aim to respond to this challenge (see Chart 6).

Chart 6: Financing

COMPONENT	ITEM
F1. Investment needs assessment	**Assessment needs** The government has identified the investment needs necessary for the objectives of the Energy Transition (ET).
	Resource Identification The government has identified the financing sources necessary for the objectives of the ET.
F3. Transparency	**Monitoring mechanisms** The government has established monitoring mechanisms of the ET financing system.
F3. Transparência	**Transparency mechanisms** The government has established mechanisms to ensure transparency in ET financing.

Fonte: Elaboração própria.

Exploring international experiences (international benchmarking)

Germany: Efficiency of Funding Programs

SAI Germany identified that several funding programs related to the energy transition exhibit low efficiency, resulting in high costs without proportional benefits. The audit on "Measures to Implement the Energy Transition by the Federal Ministry of Economic Affairs and Energy" emphasized the importance of consolidating and quantifying government expenditures, assessing whether resources are being used effectively and aligned with expected outcomes to ensure that programs are financially sustainable.

United States: Audit of Energy Transition Financing Laws

The U.S. Government Accountability Office (GAO) is auditing three key laws for energy transition financing: the CHIPS Act (or the Semiconductor Production Incentives Act), the Infrastructure Investment and Jobs Act, and the Inflation Reduction Act. These audits focus on evaluating the efficiency and cost-effectiveness of these programs, ensuring that resources are applied effectively to promote carbon reduction and economic sustainability.

Costa Rica: Renewable Energy Financing

SAI Costa Rica conducted audits of hydropower and wind power projects financed by trust funds, assessing whether the financing options minimize costs and avoid creating "stranded assets", such as fossil fuel infrastructure that could become obsolete. The audit on the "Challenges of the Energy Transition from the Perspective of Public Finances" reinforced the need to ensure that resources are optimized and that funding decisions align with the objectives of the energy transition.

European Union: Gaps in National Energy and Climate Plans

The European Court of Auditors (ECA) highlighted that many of the European Union's National Energy and Climate Plans lack detailed information on investment needs and funding sources, making it difficult to assess their feasibility. Therefore, audits must critically evaluate the quality and comprehensiveness of these plans, ensuring they are well-structured to facilitate the energy transition and achieve climate goals.

4. Energy transition thematic areas

SAIs play a crucial role in evaluating public energy transition policies by verifying their development, the effectiveness of their implementation, and the transparency of their results. In this Axis, the assessment items are intended to support this analysis (see Chart 7).

Chart 7: Energy transition thematic areas

COMPONENT	ITEM
T1. Government agenda development	There is a government agenda for the public policy
	The process of formulating and selecting the policy or action involved stakeholder participation.
T3. Implementation	The public policy or action is made official through a normative act.
	The policy or action has objectives and targets for achieving results.
	The policy or action has measurable, appropriate, and realistic objectives with estimated implementation time and expected effects.
T3. Implementação	Implementation responsibilities are well-defined.
	Key implementation risks have been identified and addressed.
	The objectives and short-term results of the public policy or action are being achieved.

T4. Assessment and transparency	Policy or action indicators are measured and monitored.
	Public policy or action has had the expected effect.
	Information on the performance of the policy or action is published in an accessible format.

Source: Self-produced

Exploring international experiences (international benchmarking)

European Union: Review of Climate and Energy Targets

The European Court of Auditors (ECA) adopted a forward-looking approach in auditing the EU's climate and energy targets. Through modeling and projections, the report "EU Climate and Energy Targets" assessed whether current policies are sufficient to achieve the 2030 objectives. This prospective method goes beyond traditional audits, focusing on future commitments and providing a model for other SAIs that wish to monitor long-term targets.

Indonesia: Evaluation of Energy Policy

SAI Indonesia is auditing the national energy transition plan, which aims to gradually replace fossil fuels with renewable sources. The "Performance Audit Summary of the Energy Transition" evaluates the security and sustainability of energy access, using both quantitative data and energy projections, along with big data analysis to forecast the impact of policies. The focus includes reviewing the efficiency of the energy mix and the governance readiness to support a long-term transition.

To access the experiences of other SAIs on energy transition, refer to the International Benchmarking section, which provides a detailed comparative overview of the practices and outcomes of audits conducted by various institutions around the world. Access the results here: sites.tcu.gov.br/transicao-energetica/index.html

Click or scan it

OUTCOMES PRESENTATION

The audit team developed an approach focused on the clarity and accessibility of the results. Throughout the process, best practices were analyzed to ensure that the information is easy to understand.

Charts and tables were chosen as the main forms of presentation, allowing the data to be visualized intuitively. Assigning colors to scores in tables also makes it easier to visualize performance and simplifies result interpretation, ensuring that audit findings are communicated in a clear and accessible manner.

Tip: Using conditional formatting in spreadsheets, you can assign colors to whole number scores. Intermediate colors are automatically applied to aggregated values, providing a quick and intuitive overview of the audit results.

In Chart 8, below, each score is assigned a color, according to the classification.

Chart 8: Assessment items definition

ITEMS		
SCORE	IMPLEMENTATION STAGE	COLOR
0	Not implemented	red
1	Low implementation	orange
2	Partial implementation	yellow
3	High implementation	green

Source: Self-produced.

The color presentation approach can be applied to any of the Axes evaluated, facilitating the understanding of progress and highlighting areas that need more attention.

PRACTICAL APPLICATION

The practical examples presented in this guide consist of fictitious evaluations, created to simulate potential scenarios. These examples are designed to illustrate the suggested approach and provide a better understanding of how the evaluation process was applied.

While these simulations do not represent real audit results, they serve as a reference to guide the implementation of assessment practices in the context of the energy transition.

The following example, related to the Governance Axis (see Chart 9), can also be applied similarly to other Axes, such as Fair and Inclusive Transition and Financing, offering a clear and structured presentation of results for each of these Axes.

Wind farm
Source: Adobe Stock

Governance

Chart 9: Governance

COMPONENT	ITEM	SCORE	AGGREGATE SCORE BY COMPONENT
G1. Legal and regulatory framework	G1.1 Existence of legal framework	3	2,7
	G1.2 Existence of sectoral legal framework	3	
	G1.3 Integration	2	
G2. Government structure	G2.1 Existence of governmental structure	3	2
	G2.2 Well-defined responsibilities	2	
	G2.3 Leadership	1	
G3. Planning	G3.1 Cost-Effectiveness	0	0,8
	G3.2 Long-term strategy	1	
	G3.3 Alignment with NDC	1	
	G3.4 Synergies with the SDGs	1	

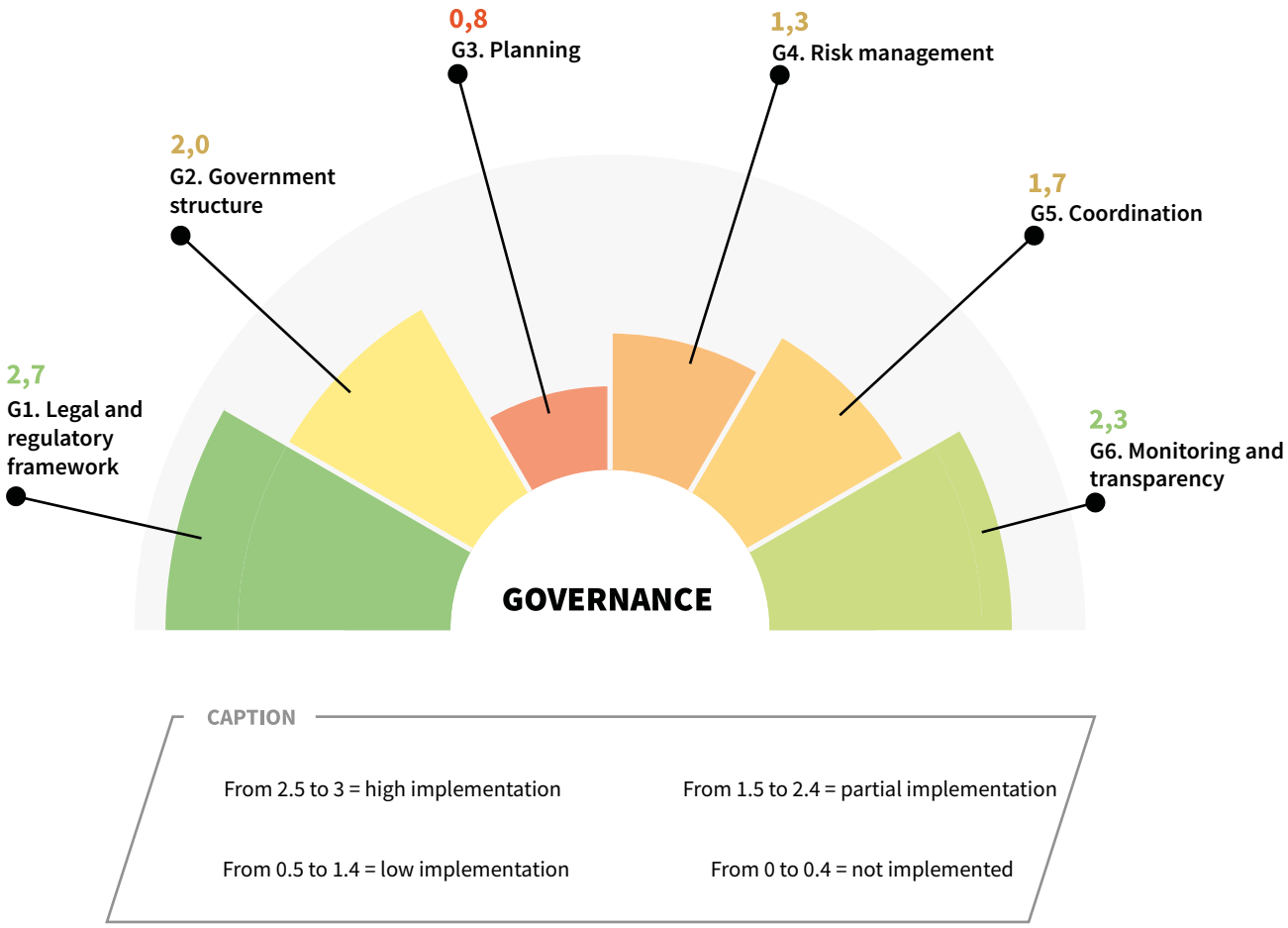
G4. Risk management	G4.1 Risk mapping	2	1,3
	G4.2 Risks evidence	1	
	G4.3 Risks in key planning instruments and sectoral policies	1	
G5. Coordination	G5.1 Horizontal coordination mechanisms	3	1,7
	G5.2 Interaction Dynamics	2	
	G5.3 Vertical coordination mechanisms	0	
G6. Monitoring and transparency	G6.1 Monitoring	3	2,3
	G6.2 Regularity	2	
	G6.3 Transparency	2	
Governance Axis aggregate score			1,8

Source: Self-produced

Tip: Through graphs (see Graph 2), it is possible to quickly visualize aggregate scores, highlighting the most relevant results without overloading the presentation with excessive visual information.

This approach makes it easy to understand the overall performance on the Axis, providing a clear and objective view of the critical aspects.

Graph 2: Components of Governance Axis with scores from previous example



Source: Self-produced

In the Energy Transition thematic areas Axis, we suggest the same approach; however, as already mentioned, the items are scored in each analyzed policy.

ENERGY TRANSITION THEMATIC AREAS

The following is an example of a fictitious assessment on the thematic area of integration of renewables in the Power Sector, identifying six distinct government policies or actions linked to this theme (see Chart 10).

Chart 10: Integration of renewables in the Power Sector

COMPONENT	ITEM	Energy auctions	Microgeneration and Mnigeneration Distributed Systems	Offshore wind power	Incentives for renewable sources	Transmission tariff discount	Import tax	Aggregate by item	Aggregate by component
1. Government Agenda develop-ment	1.1 There is a government agenda for the public policy	3	3	3	3	3	3	3	2,3
	1.2 The formulating and the selection process of policy or action involved stakeholder partici-pation.	1	1	2	1	2	2	1,5	
2. Institution-aliza-tion	2.1 The policy or action is made official through a normative act.	3	3	1	3	2	3	2.5	2.1
	2.2 The policy or action has objectives and targets for achieving results.	3	2	2	2	2	3	2.3	
	2.3 The policy or action has measura-ble, appropriate, and realistic objec-tives with estimated implementation time and expected ef-fects.	3	2	2	0	3	1	0	

3. Implementation	3.1 Implementation responsibilities are well defined.	3	3	0	3	2	3	2.3	1,9
	3.2 Key implemen-tation risks have been identified and addressed.	3	3	0	0	1	2	1,5	
	3.3 The objectives and short-term results of the public policy or action are being achieved.	3	2	0	3	1	2	1,8	
4. Assessment and transparency	4.1 Policy or action indicators are measured and monitored.	2	0	0	1	2	1	1	1,1
	4.2 The public policy or action has achieved the ex-pected effect.	1	0	0	2	2	0	0,8	
	4.3 Information on the performance of the policy or action is publicly available and accessible to citizens.	3	2	1	0	0	3	1,5	
AGGREGATE SCORE BY POLICY OR ACTION		2.6	2.1	0,8	2.5	2.1	2.1	2.1	
								AGGREGATE SCORE BY THEMATIC AREA	

CAPTION

From 2.5 to 3 = high implementation

From 1.5 to 2.4 = partial implementation

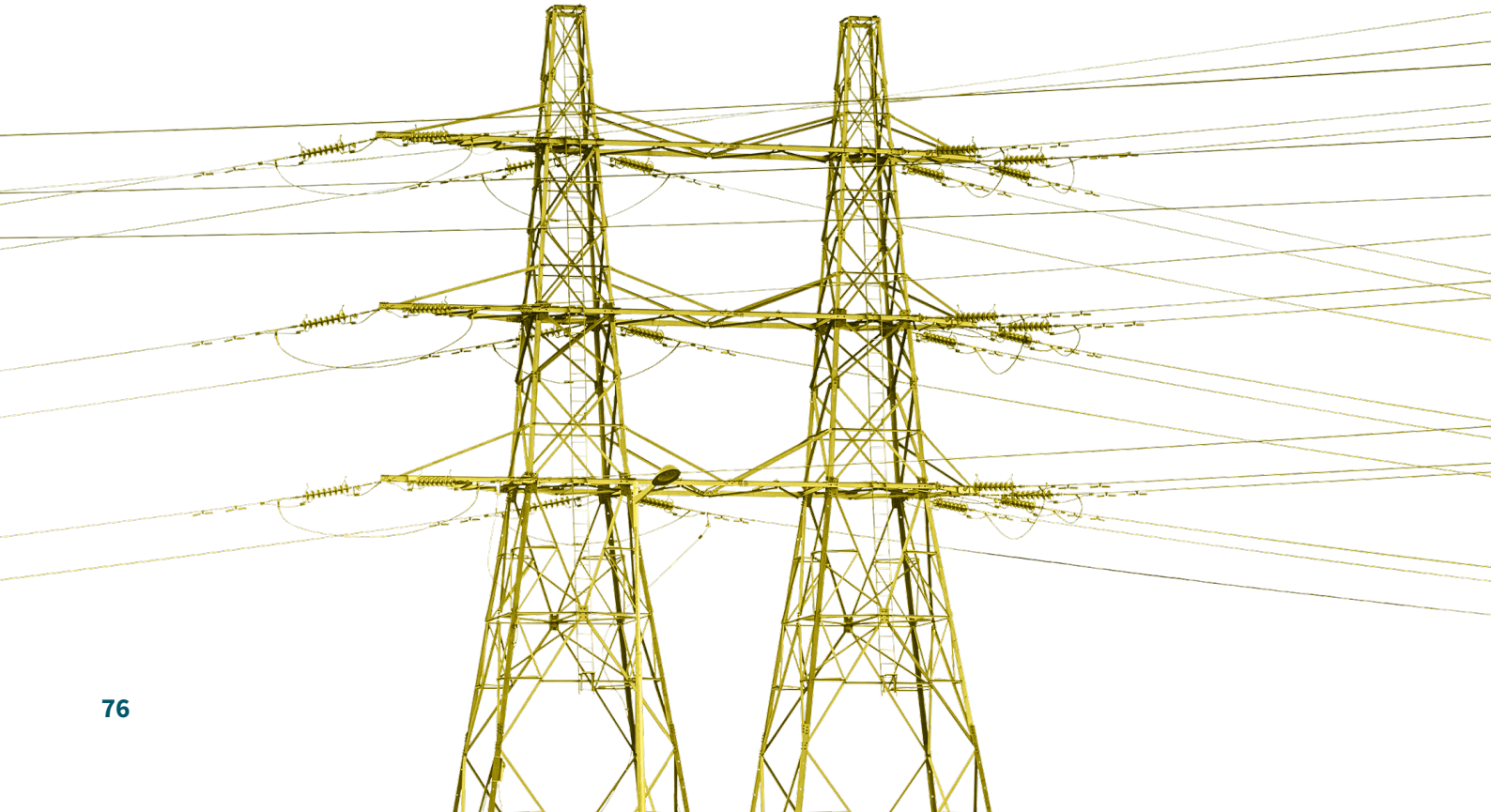
From 0.5 to 1.4 = low implementation

From 0 to 0.4 = not implemented

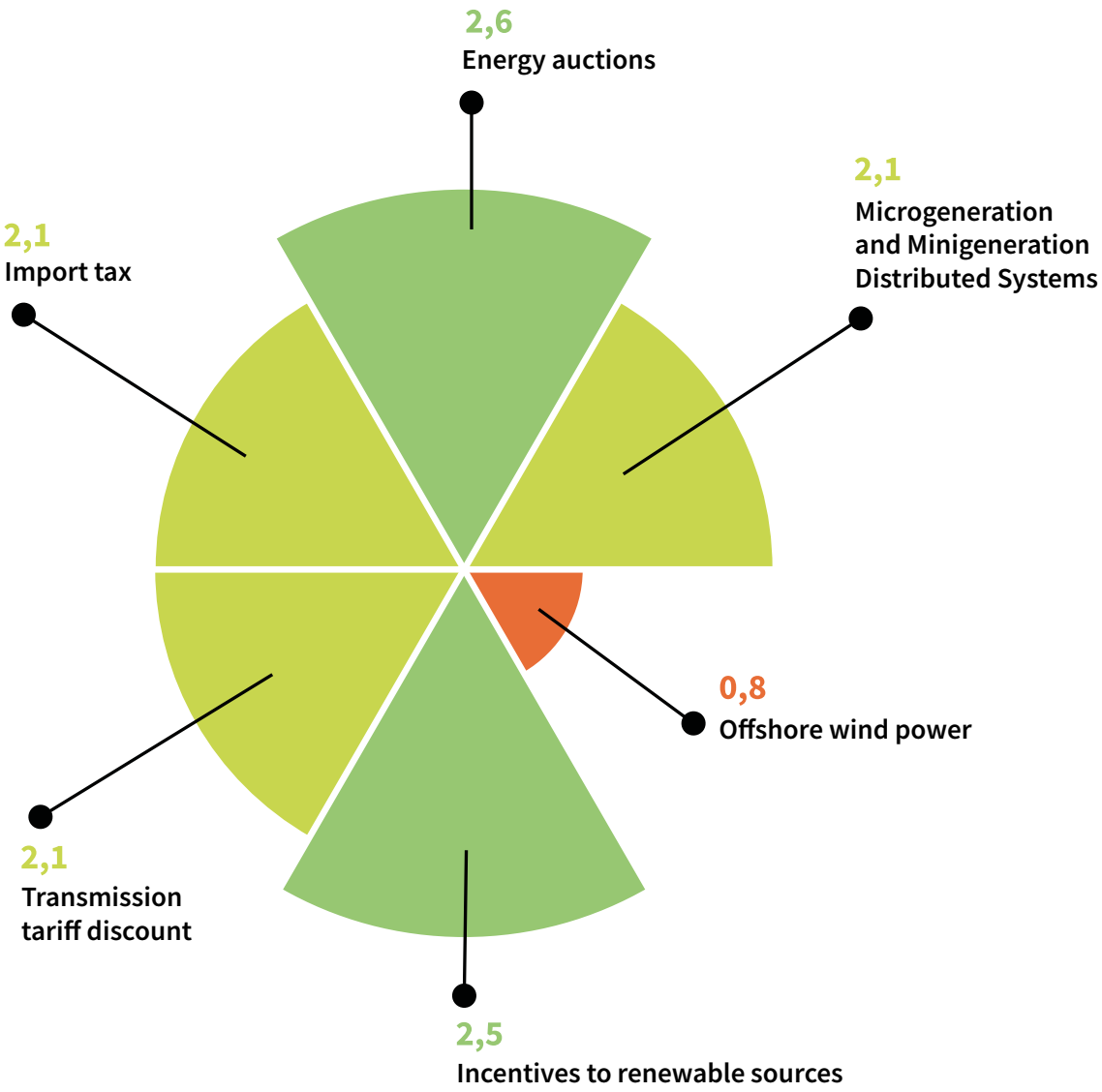
Highlight: The previous examples illustrate which items and components are more advanced in their implementation, making it easy to assess maturity levels across the different axes. For example, the government agenda development process (item 1.1) is fully implemented in all evaluated policies and actions. In contrast, the monitoring and measurement of indicators (item 4.1) and the evaluation of policy effects (item 4.2) show low levels of implementation, indicating areas that require more attention.

For the Energy Transition thematic areas Axis, graphs are valuable for showing aggregate scores by component and by government policy or action. They provide a clear and concise view of the performance of different policies, facilitating the analysis of results and the identification of areas needing further attention.

The following two graphs (see Graphs 3 and 4) illustrate the example developed for the **Energy Transition thematic areas**, using the scores from the previous example.



Graph 3: Renewable energy policies



CAPTION

From 2.5 to 3 = high implementation

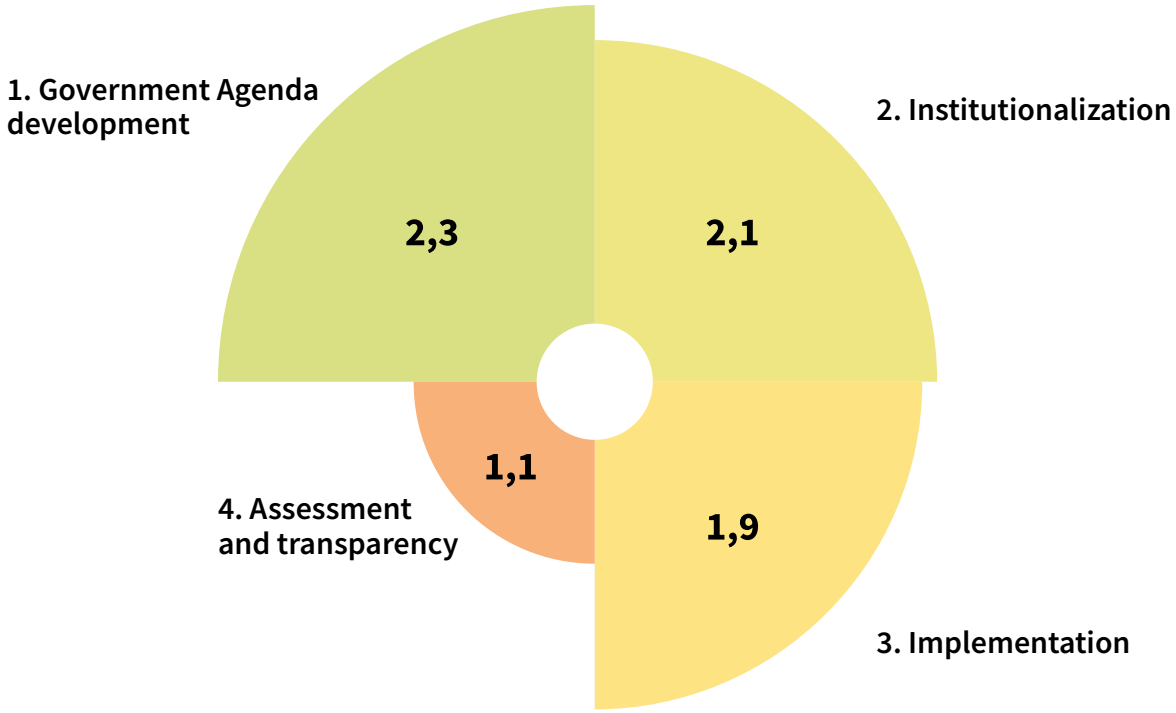
From 1.5 to 2.4 = partial implementation

From 0.5 to 1.4 = low implementation

From 0 to 0.4 = not implemented

Source: Self-produced

Graph 4: Result by Components of the Renewable Energy thematic area



CAPTION

From 2.5 to 3 = high implementation

From 1.5 to 2.4 = partial implementation

From 0.5 to 1.4 = low implementation

From 0 to 0.4 = not implemented

Fonte: Elaboração própria.

Highlight: For the energy transition thematic areas Axis, it is recommended not to create graphs with the aggregated evaluation scores by item for each theme. Instead, the presentation should focus on components, as the volume of information can make the graph difficult to understand. Using charts is more suitable for highlighting the items.

BEST PRACTICES AND LESSONS LEARNED

Auditing should be viewed as a dynamic, ongoing process that evolves and adapts as needed, rather than remaining static or fixed. The planning phase also needs to be flexible to accommodate the realities and limitations that arise during execution.

The audit team faced different challenges and realities that required adjustments to the initial plan. These changes were necessary to ensure that oversight actions remained effective and aligned with established objectives. By adapting to the circumstances encountered, the audit team not only maintained the rigor of the audit but also ensured that the conclusions were relevant and applicable to the observed reality.

This section compiles good practices and lessons learned from the contributions of the TCU, other SAIs and stakeholders involved in developing the guidelines suggested in this guide. It highlights how, despite the challenges encountered, audit work can drive concrete actions in the energy transition process and in addressing climate change.

Governance

The Brazilian audit faced challenges when analyzing **item G3.1** (Governance Axis; Planning component), related to the cost-effectiveness of energy transition actions. The complexity of this item lies not only in verifying whether the resources are being used but also whether they are being applied efficiently and with a measurable impact on the energy transition.

The cost-effectiveness analysis is part of the public policy formulation phase and initially seemed appropriate to evaluate resource efficiency. However, Brazil's energy planning model, which is more indicative than determinative, focuses on creating regulatory conditions and incentives for market development, thus reducing the applicability of this item.

During the analysis, the audit team identified the need for a more detailed evaluation of government choices, which requires a thorough assessment of the costs and benefits of each decision, demanding more time and resources. In some cases, it was considered that it might not be the government's role to choose the most cost-effective alternatives, as the market and technological development play significant roles in defining the most efficient solutions for the energy transition. Nevertheless, in certain situations, evaluating cost-effectiveness might still be necessary.

Given these limitations, the audit team prioritized other areas, emphasizing the importance of balancing the depth of analysis with time constraints. This process underscored the need for flexibility when auditing complex policies, recognizing when the market should guide decisions and when the government should intervene.

Fair and inclusive transition

The Brazilian audit evaluated the three components proposed for the Fair and inclusive energy transition Axis, with a particular focus on the topic of "Tackling energy poverty". One of the main challenges was assessing the real impact of the energy transition on vulnerable households.

The audit revealed an important issue: despite Brazil's abundant energy resources, vulnerable families still face high energy costs. This finding highlights the need to improve analytical tools to better understand the complex relationship between energy costs and their social impact, ensuring that the energy transition benefits everyone equally.

Another key aspect was identifying and analyzing cross-subsidies in the power sector, which proved essential to understanding inequality in the distribution of energy benefits. The audit also showed the need for a more detailed approach to understanding how these policies impact different population groups, and to assess whether the subsidies align with the principles of fairness and inclusion.

The experience also revealed that, while there are legal criteria related to energy justice, many are vague or lack clear, objective goals. This issue limited the methodology effectiveness when applied to Brazil's context, making it difficult to assess progress in energy justice. The key lesson here is the importance of establishing specific, measurable criteria and goals for public policies to facilitate monitoring and evaluation. A more robust methodological approach, with clear indicators and well-defined targets, is essential to measure the effectiveness of policies and ensure they meet the needs of the most vulnerable.

These lessons highlight the need for continuous improvement in audit approaches and tools. A more detailed and tailored approach to the complexities of the energy transition can significantly enhance audit effectiveness, ensuring that public policies are truly fair and inclusive.

Financiang

The Brazilian energy transition audit demonstrated that the effectiveness of transition policies depends not only on the analysis of investments and available resources but also on the regulatory framework and institutional collaborations.

Thus, the Brazilian audit **expanded beyond the initial Audit Scope proposed** for the Energy Transition Financing Axis, broadening its focus to gain a deeper understanding of the country's financial scenario. This shift was influenced by discussions in the G20 and SAI20 meetings and seminars, which introduced new perspectives on energy financing that had not been previously considered. The review sought to align audit efforts to global concerns and maximize Brazil's contribution to its energy transition.

Given the complexity of the energy transition, the audit acknowledged the importance of a deeper understanding of the financing structures in Brazil. The team focused on identifying the **main sponsors and analyzing how financial structures either support or constrain** the development of clean technologies in the country.

Drawing inspiration from international studies, the audit team mapped the capital flows available to meet the estimated investment needs, covering various financing sources public (national and international) and private, also technologies (hydropower, wind, solar, biomass, energy efficiency, natural gas, biofuels, low-emission hydrogen, critical minerals, and CCUS), as well as financing instruments (subsidies, debt issuance, equity investments, credit lines).

This effort revealed both strengths and weaknesses in the public governance of the national energy financing system, providing valuable insights into enhancing the energy transition.

The audit team also looked to international references to map out the main barriers to financing clean technologies in Brazil. A critical takeaway was that, to promote the energy transition effectively, it is crucial to understand and address these barriers. Creating strong economic incentives, improving access to credit for sustainable projects, and developing public policies that ensure continued financial support are essential steps.

This perspective reinforces the need for an approach that considers both the financial challenges and the solutions required to create an environment conducive to the advancement of clean technologies. By deepening the analysis, the Brazilian audit revealed a comprehensive view of the financial challenges the country faces, as well as the key solutions needed to overcome them.

Table 1 below outlines an example used by the audit team regarding the most significant **barriers** to financing clean technologies.

Table 1: Main barriers to investment in clean technologies

POLITICAL	MARKET	TRANSFORMATION
Lack of clear strategic political direction; Lack of regulatory framework; Lack of transparency and integrity.	Missing markets; Micro-level (off-taker, technology risk…) Macro-level risk (country risk, inflation…)	Lack of infrastructure; Unskilled labor; Stranded assets.

Source: Data adapted from Deloitte, 2023, p. 21.

In addition to identifying the barriers to financing the energy transition, the audit team expanded its scope by mapping key solutions that could more effectively direct investments to sustainable projects. This effort included an analysis of financial instruments and public policies capable of attracting capital to clean technologies, as well as the identification of incentive mechanisms that can reduce risks for investors.

The audit experience emphasized the importance of creating a supportive regulatory environment and strengthening public-private partnerships. These measures are essential to ensuring the continuous flow of resources and accelerating the energy transition.

Table 2 below contains an example of the main **key solutions** raised by the audit team to guide investments in sustainable projects

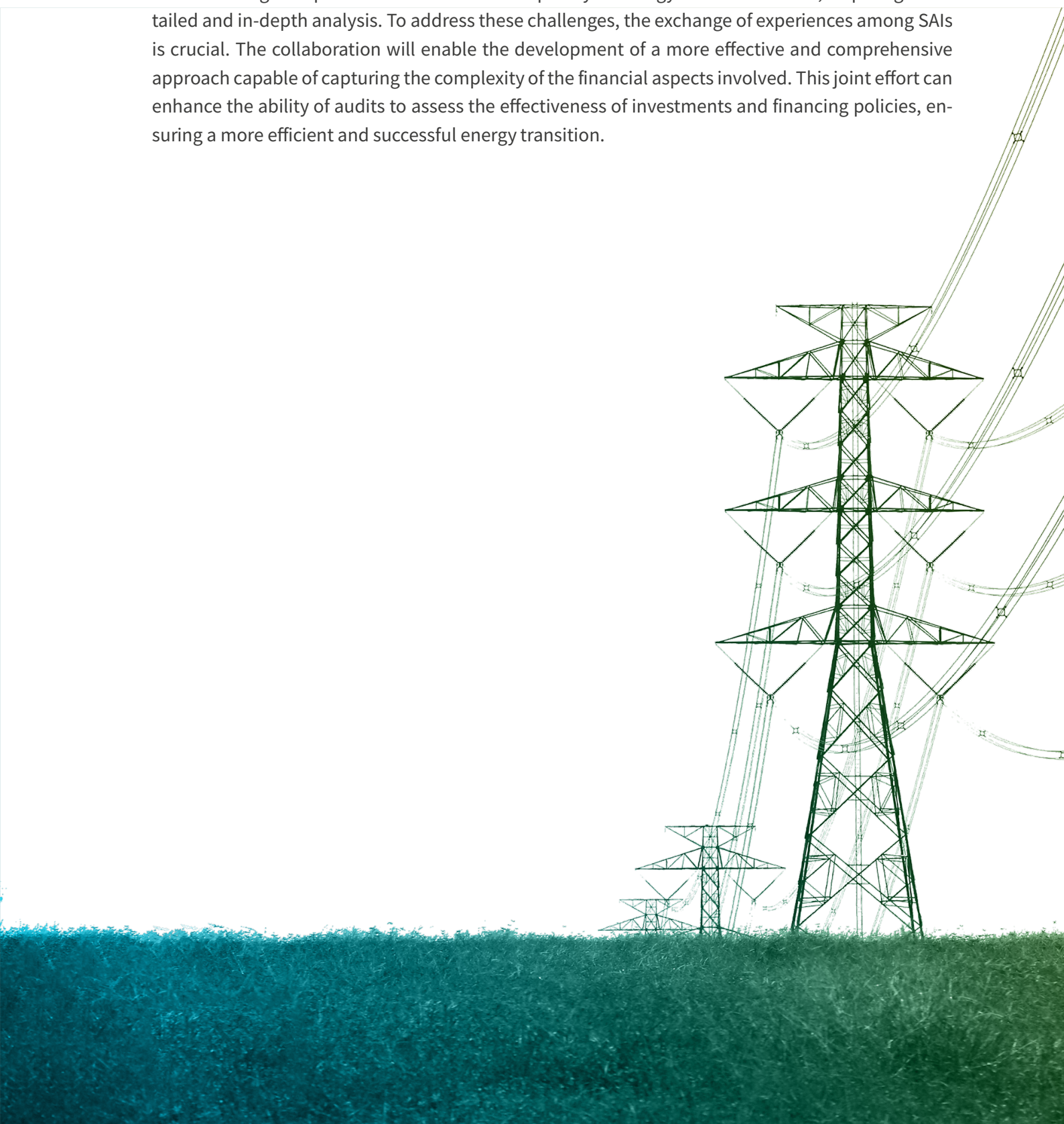
Table 2: Key solutions to turn green projects more bankable

<table>
<tr><th>De-risk green projects</th><th>Bridge the green-fossil cost gap</th><th>Cutting fossil fuels</th></tr>
<tr><td colspan="2">Develop local green financial markets</td><td>End public support for fossil assets</td></tr>
<tr><td>Dilute risk via portfolio diversification</td><td colspan="2">Set up greenhouse gas emission pricing</td></tr>
<tr><td>Create a low-risk project environment</td><td>Reduce green tech costs</td><td>Deal with stranded assets</td></tr>
<tr><td>Provide loss reserves and guarantees</td><td>Reduce green project upfront costs</td><td>Deal with stranded people</td></tr>
<tr><td>Reduce revenue risk</td><td></td><td></td></tr>
<tr><td colspan="2">Make green projects investable</td><td></td></tr>
<tr><td colspan="3">Channel private funds into the green transition</td></tr>
</table>

Source: Data translated and adapted from Deloitte, 2023, p. 21.

The audit also evaluated the implementation stage of the energy transition financing system, considering the different types of financing: **public, private, national, and international**. While the analysis identified significant progress in some areas, it also pointed out critical challenges.

The Financing Axis presents considerable complexity in energy transition audits, requiring a detailed and in-depth analysis. To address these challenges, the exchange of experiences among SAIs is crucial. The collaboration will enable the development of a more effective and comprehensive approach capable of capturing the complexity of the financial aspects involved. This joint effort can enhance the ability of audits to assess the effectiveness of investments and financing policies, ensuring a more efficient and successful energy transition.



Energy transition thematic areas

As mentioned at the beginning of this chapter, an audit should be seen as a dynamic and adaptable process. The approach proposed in this guide provides important additions to the work carried out by the Brazilian audit, particularly on Axis 4 – Energy Transition thematic areas.

For component P3 (Implementation), this guide includes the items “definition of responsibilities” and “risk management,” expanding the control approach needed for effective implementation. These items ensure that responsibilities are clearly defined and that risks associated with public policies and actions are adequately managed.

Component P4, previously defined in the audit as “Assessment and stability,” has been updated to “Assessment and transparency” in this guide to better reflect the analysis. New items were added, addressing the monitoring of indicators and the expected effects of policies and actions, in addition to updating the transparency section. The analysis of public policy stability was removed, as the audit team considered it unfeasible to evaluate how resilient policies are to future political cycles. Consequently, the review was limited to assessing their resilience to past changes.

These adjustments demonstrate how the audit can maintain its rigor and relevance by adapting to real-world challenges, aligning with the expectations and needs of both managers and society.

CLOSING REMARKS

The objective of this guide is to seize the Brazilian experience to provide an approach that enables the analysis of the maturity of energy transition actions and policies in different national contexts. The suggestions presented should be viewed as flexible tools for comprehensive initial analysis and adaptable to the various realities encountered.

The parameters, methods, items, and approaches can and should be adjusted as needed. Partial application of the guide is also recommended for audits with a more specific focus, limited resources, or shorter timelines.

Implementing this guide plays a crucial role in advancing international commitments related to climate change. By providing a robust and adaptable framework for energy transition analysis, the guide helps SAIs assess and monitor progress towards global targets outlined in international agreements (Governance Axis: G3. Planning; items: alignment with the NDC and synergies with the SDGs).

By offering a framework that guides SAIs in analyzing key indicators related to energy transition, the audit verifies that public policies are aligned with emission reduction and sustainable transition goals, ensuring that governments adopt practices that advance in this direction. The adoption of these guidelines enables a more effective audit of policies and actions aimed at reducing emissions and promoting sustainable energy practices.

The international experiences of other SAIs, along with contributions from experts and stakeholders involved in the energy transition theme, are valuable sources of inspiration to refine and expand the proposed approach. The intention is to open new paths and reflections for the oversight of energy transition policies and actions that are fair and effective.

With this work, we hope that each Supreme Audit Institution can not only contribute to the implementation of more effective local policies but also strengthen the global effort to mitigate the impacts of climate change, ensuring a more sustainable and equitable energy transition for all.

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