

# **SUMMARY OF THE IMPACT AND DEPENDENCY ASSESSMENT**

**2025**



## SUMMARY OF THE ASSESSMENT ON IMPACT AND DEPENDENCY

### 1 Introduction

The recent global scenario points to a collapse of the economic growth versus biodiversity conservation dichotomy, posing a significant risk to institutions whose operations are linked to natural resources. Consequently, there is a growing need to assess the risks and impacts inherent in corporate operations, addressing robust strategies to generate a positive net impact.

To expand this understanding at Cemig, studies were initiated based on the framework proposed by the TNFD - Taskforce on Nature-related Financial Disclosures. The methodology, known as LEAP (Locate, Evaluate, Assess, and Prepare) provides practical guidance for formulating such strategies, based on an integrative assessment of dependency, impacts, risks and opportunities.

As a result of this assessment, Cemig will develop a Biodiversity Action Plan containing actions, guidelines and goals to be achieved and continuously monitored, focusing on being no net loss and nature positive.

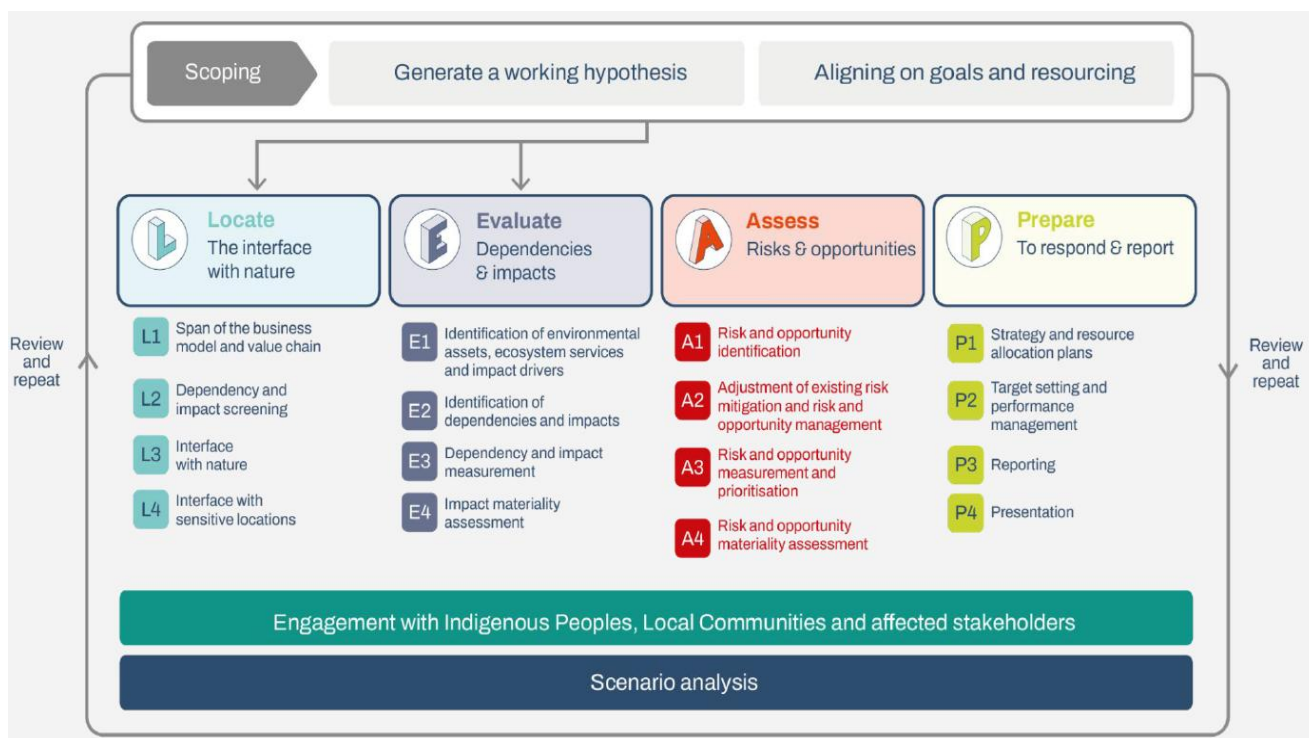
### 2 Methodology

The methodological framework proposed by the TNFD is centered on six general requirements, which is a differentiating factor in relation to the Taskforce on Climate-Related Financial Disclosures (TCFD) approach to climate reporting:

1. An approach focused on materiality relevance;
2. The scope of disclosures, covering both business operations and value chain;
3. Considerations regarding nature-related dependency, impacts, risks, and opportunities, based on an assessment of impacts and dependencies;
4. The specific location of its interface with nature as an integral part of the assessment;
5. Integration with other sustainability issues, including climate-related disclosures;
6. Engaging stakeholders in the reporting process.

These requirements interface with four recommendation pillars associated with (i) Governance, (ii) Strategy, (iii) Risk and impact management and (iv) Metrics and goals. The steps are shown in the following figure.

Figure 1 - The LEAP Methodology of the TNFD



Source: TNFD Version 1.0, 2023.

## 2.1 Locate Step

This step of the TNFD involved identifying and mapping the geographic areas and operational assets with the greatest dependency and impact on the natural environment, particularly those interacting with ecologically sensitive locations. The study assessed Cemig's direct operations by first understanding the nature of its processes, identifying the most relevant data to be collected.

**A preliminary definition was defined for the assets included in the scope of the analysis, contemplating 32 energy generation assets, being 28 hydroelectric plants, 2 wind farms, and 2 photovoltaic plants, in addition to 5,016.1 km of Transmission Lines (LTs) and 565,144 km of Distribution Lines (LDs) (which total 393,609 hectares of asset area).**

Qualitative and quantitative data regarding the assets' impact factors (effluents, waste, water consumption, GHG emissions, among others) were collected through documental analysis and meetings with focal points. The most material processes in the production chain were also identified and prioritized in terms of nature-related impacts and dependency, using the calibrated Encore 2024 (Exploring Natural Capital Opportunities, Risks and Exposure). Encore is a tool supported by the mapping of a broader and less granular view of a company's potential material impacts and dependencies according to a sectoral and global scenario. The tool identified the processes most directly linked to Cemig's core operations.

By combining the results from the impact factors with the Encore screening, the Materiality Index was obtained. The interface data with the natural environment and the Ecological Sensitivity Index considered the overlap of assets with priority ecoregions for the conservation of nature, the biomes

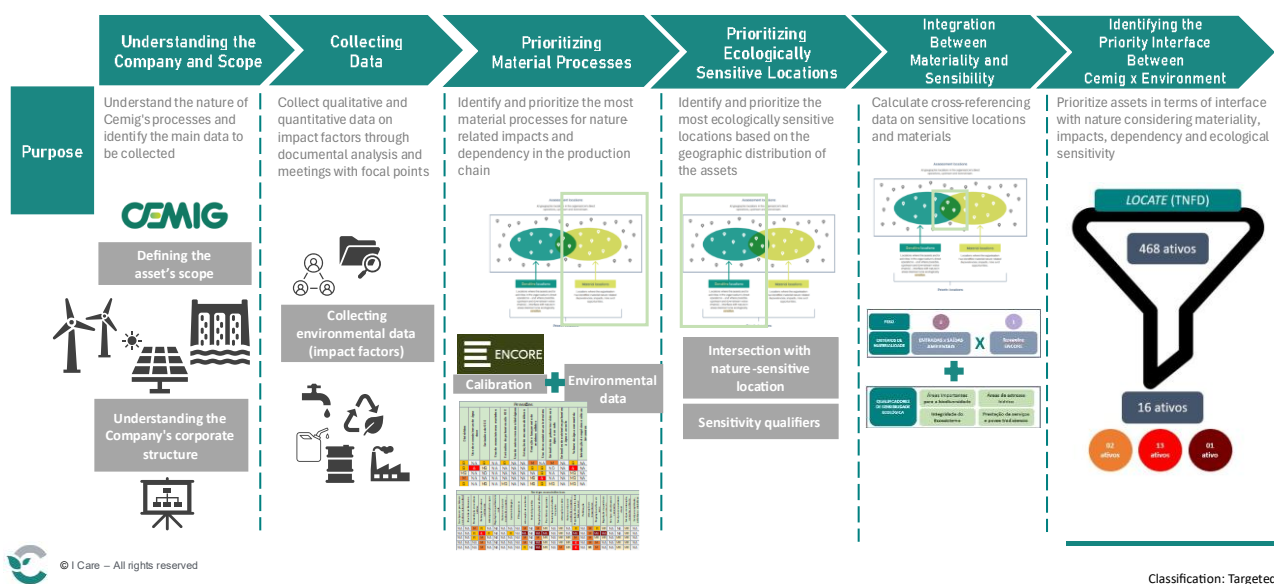
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in which they are inserted, and geographic regions with ecological, biological or environmental characteristics making them particularly vulnerable or valuable in terms of biodiversity and ecosystem services, named Sensitive Areas under the TNFD. The combination of the assessed factors provided robust data for strategic prioritization in terms of biodiversity. The following figure shows the work steps that were developed.

Figure 2 - Main Work Steps – Locate



### MAIN WORK STEPS - LOCATE



## 2.2 Evaluate Step

The information gathered during the previous step, such as the identification of assets that compose the value chain and collected data, was used to assess the dependency on ecosystem services for the mapped processes. For this, we also used the Encore tool, considering 25 ecosystem services adapted to the Company's context.

To obtain the priority dependency, we carried out a qualitative analysis of ecosystem services based on the calibrated results for the dependency heatmap, and an integrated assessment of the energy sector's dependency on contributions from the ecosystem, particularly within Cemig's context. Materiality for financial losses and pressures generated by the Company's activities that impact the contributions from the ecosystem were also analyzed.

To complement the analysis, we also sought to identify possible factors that interact with the prioritized ecosystem services, allowing a more comprehensive view of the dependency context and how it effects environmental conditions, pinpointing what influences can impact the functioning of the ecosystems that the operations rely on. They were based on categories within the five main biodiversity pressures, namely: (i) climate change, (ii) change in the use of terrestrial, aquatic and marine ecosystems, (iii) overexploitation of resources, (iv) pollution, and (v)

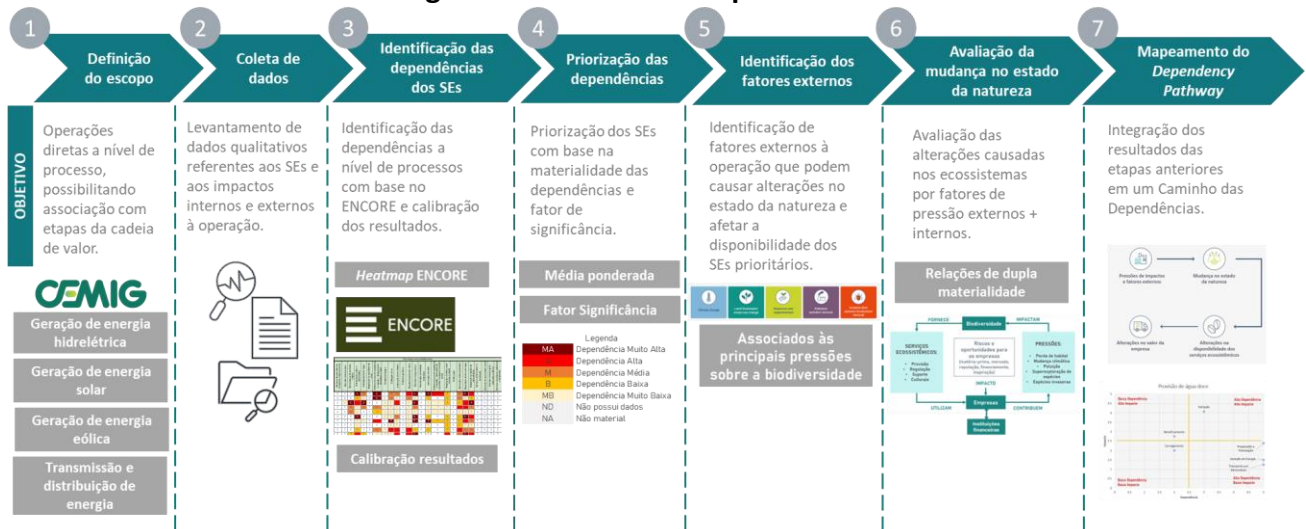
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introduction invasive non-native species.

Changes caused to nature by internal impact factors (identified in the impact heatmap) and synergies with external factors were assessed for prioritized ecosystem services. Lastly, we associated the assessed processes with the value chain steps of the direct operations, allowing us to relate internal impact factors with changes to the environment.

The summary of the main work steps is shown in Figure 3.

**Figure 3 - Main Work Steps – Evaluate**



## 3 RESULTS

### 3.1 Locate

The majority of the assets that were assessed are concentrated in the state of Minas Gerais, Brazil. The Encore heatmap for impacts and dependency is presented in Tables 1 and 2 below. Together with the impact factors, we obtained the Materiality Index of Impacts and Dependency, in which **4 of the 468 assets are considered material**. None of the assets in Photovoltaic Plants and Transmission or Distribution Lines were identified among the most material assets for this step of the assessment.

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Table 1 - Impact Heatmap of Cemig's Direct Operations - Notes

		Pressures												
		Disturbances	Use of Freshwater Ecosystems	GHG Emissions	Use of Marine Ecosystems	Non-GHG Pollutant Emissions	Use of Other Biological Resources	Extraction of Abiotic Resources	Generation and Release of Solid Waste	Use of Terrestrial Ecosystems	Emissions of Toxic Pollutants to Water and Soil	Emissions of Polluting Nutrients to Water and Soil	Volume of Water Consumed	Introduction of Invasive Non-native Species
Energy Production Step	Hydroelectric Energy Production	L	H	L	NA	L	NA	NA	L	M	VL	NA	L	NA
	Solar Energy Supply	VL	NA	ND	NA	L	NA	NA	L	L	VL	NA	VL	NA
	Wind Energy Supply	M	NA	NA	NA	L	NA	NA	L	H	VL	NA	VL	NA
Transmission and Distribution Step	Transmission and Distribution of Electric Energy	L	NA	M	NA	M	NA	NA	L	L	L	NA	VL	NA

**Legend**  
 VH = Very High Impact  
 H = High Impact  
 M = Medium Impact  
 L = Low Impact  
 VL = Very Low Impact  
 ND = No Data Available  
 NA = Not Material

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Table 2 - Dependency Heatmap of Cemig's Direct Operations

		Ecosystem Services																									
		Energy Supply from Animal Sources	Provision for Biomass	Solid Waste Remediation	Soil and Sediment Retention	Self-purification of Water	Soil Quality Regulation	Other Regulation and Support Services - Dilution by Atmosphere and Ecosystems	Biological Control	Air Filtration	Flood Mitigation	Genetic Material	Global Climate Regulation	Provision for Freshwater	Maintenance of Nursery Habitats	Noise Mitigation	Other Regulation and Support Services - Sensory Impacts Mitigation (except noise)	Local Climate Regulation (micro and meso)	Pollination	Storm Mitigation	Water Flow Regulation	Precipitation Pattern Regulation	Recreation-related Services	Visual Amenity Services	Education, Research and Science Services	Spiritual, Artistic and Symbolic Services	
Energy Production Step	Hydroelectric Energy Production	NA	NA	M	H	L	NA	NA	L	NA	VH	NA	VH	VH	NA	VL	NA	VH	NA	M	VH	VH	NA	NA	VL	NA	
	Solar Energy Supply	NA	NA	NA	M	NA	NA	NA	NA	NA	M	NA	VH	VL	NA	VL	VL	H	NA	M	M	VL	NA	VL	VL	NA	
	Wind Energy Supply	NA	NA	NA	M	NA	NA	NA	NA	NA	L	NA	VH	VL	NA	M	VL	H	NA	M	M	VL	NA	VL	VL	NA	
Transmission and Distribution Step	Transmission and Distribution of Electric Energy	NA	NA	M	M	NA	NA	NA	NA	NA	M	NA	M	VL	NA	VL	VL	H	NA	H	VL	L	NA	VL	VL	NA	

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The prioritization resulting from the intersection between the Impact and Dependency Materiality Index and the Ecological Sensitivity Index indicated **1 very high priority asset and 3 high priority assets (covering 235121 hectares)**. The other assets were considered non-priority. The distribution of these assets, by priority, is shown in Figure 4.

Assets of the same type follow the same processes and, as a result, have the same impact and dependency scores according to ENCORE. Therefore, the main factor that distinguished the score of the hydroelectric plant with the highest impact was its Impact Factors score. The asset received a maximum score (5) for the Built Area and GHG Emissions (fossil fuels) criteria. Built-up area is the criterion with the greatest weight among the components that make up the Impact Factors score - Built-up Area, Right-of-Way Area, and GHG Emissions related to fossil fuel consumption and GHG Emissions related to electricity.

For the HPP category, the right-of-way area is not evaluated, as it does not apply to this type of asset. The final score for this asset in the environmental qualifier category is the highest among the prioritized assets, at 3.85. For comparison purposes, the second-highest score among hydroelectric power plants was 3.34, followed by 3.29. The other asset prioritized by the Materiality Index was a wind farm that received a score of 2.95 for environmental qualifiers.

Figure 4 - Priority Locations



In the assessment of the Ecological Sensitivity Index, virtually all assets were classified as high priority, with 467 of the 468 assets mapped in sensitive locations. This is due to the megadiverse context of Brazil, the country where all the operations analyzed are located.

### 3.2 Evaluate

The qualitative heatmap, in Table 3, shows the processes that have some type of nature-related dependency, allowing us to identify the priority ones. We also identified that 40% of Cemig's services have some kind of dependency on contributions from the ecosystem for its processes.

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Table 3 - Dependency Heatmap – Classified by the Calibrated ENCORE Materiality

			Ecosystem Services																								
			Energy Supply from Animal Sources	Provision for Biomass	Solid Waste Remediation	Soil and Sediment Retention	Self-purification of Water	Soil Quality Regulation	Other Regulation and Support Services - Dilution by Atmosphere and Ecosystems	Biological Control	Air Filtration	Flood Mitigation	Genetic Material	Global Climate Regulation	Provision for Freshwater	Maintenance of Nursery Habitats	Noise Mitigation	Other Regulation and Support Services - Sensory Impacts Mitigation (except noise)	Local Climate Regulation (micro and meso)	Pollination	Storm Mitigation	Water Flow Regulation	Precipitation Pattern Regulation	Recreation-related Services	Visual Amenity Services	Education, Research and Science Services	Spiritual, Artistic and Symbolic Services
Direct Operations	Energy Production Step	Hydroelectric Energy Production	NA	NA	M	H	L	NA	NA	L	NA	VH	NA	VH	VH	NA	VL	NA	VH	NA	M	VH	VH	NA	NA	VL	NA
		Solar Energy Production	NA	NA	NA	M	NA	NA	NA	NA	NA	M	NA	VH	VL	NA	VL	VL	H	NA	M	M	VL	NA	VL	VL	NA
		Wind energy production	NA	NA	NA	M	NA	NA	NA	NA	NA	L	NA	VH	VL	NA	M	VL	H	NA	M	M	VL	NA	VL	VL	NA
	Transmission and Distribution Step	Transmission and Distribution of Electric Energy	NA	NA	M	M	NA	NA	NA	NA	NA	M	NA	H	VL	NA	VL	VL	H	NA	H	VL	L	NA	VL	VL	NA

Legend	
VH	Very High Dependency
H	High Dependency
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The Flood Mitigation, Storm Mitigation, Local Climate Regulation, Global Climate Regulation, Water Flow Regulation, Solid Waste Remediation, and Soil and Sediment Retention services had moderate to very high dependency, representing a relevant contribution from ecosystems for the Company's processes.

After prioritizing the ecosystem services with the greatest dependency on the Company's processes, we identified the three most relevant services among the 25 that were assessed. The first two services relate to the same natural capital - Water Provision and Water Regulation, an essential element for the Company's activities. The third service - Soil and Sediment Retention - refers to maintenance services for the ecosystem, which ensures the integrity of production structures and processes.

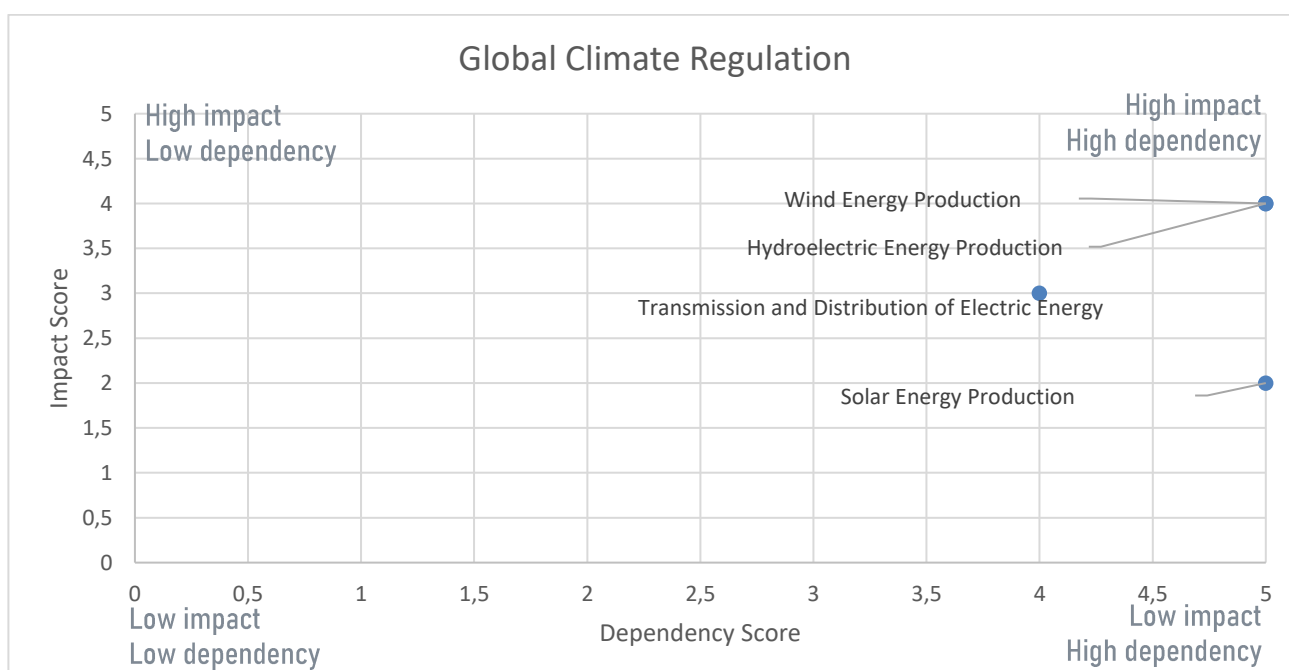
The main external pressures relating to the three priority ecosystem services were Climate Change and Changes in Land and Water Use. Other environmental factors related to the intensification of extreme weather events (such as heavy rainfall, prolonged droughts and increases in average temperatures) generate direct and indirect impacts on the energy infrastructure. In addition, regulations on greenhouse gas emissions imply direct and indirect costs for the Company, requiring investments towards more resilient production and transmission systems, as well as measures that ensure the Company complies with environmental legislation.

In terms of Land and Water Use, the depletion of vegetation cover interferes with the operation and maintenance of energy generation, distribution and transmission projects, mainly due to the risk of erosion. When this is located in a water recharge area where soil has been compacted, it affects water infiltration, reducing water availability and interfering with the generation of hydroelectric energy.

The results from the Dependency Pathway considered the steps of the value chain, the dependency on priority ecosystem services analyzed by the processes, changes to the environment and how it affects species and ecosystems, and internal and external pressures on the Company's processes.

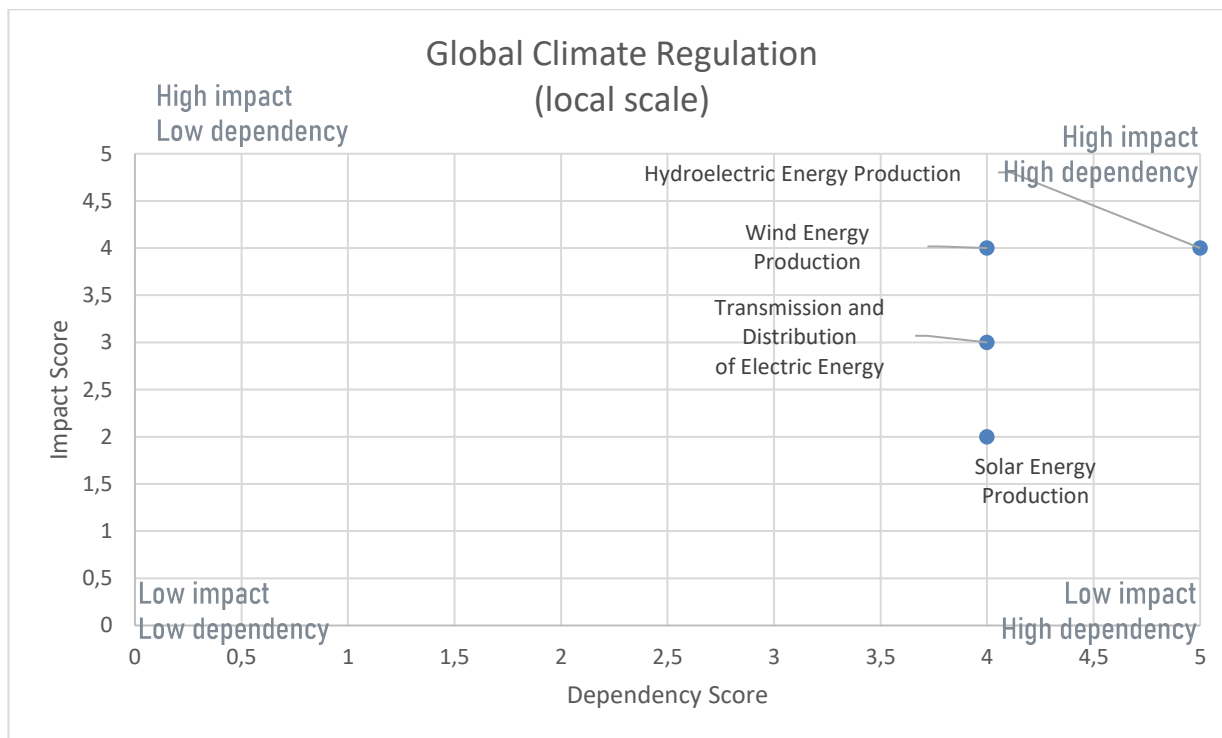
Solar and wind energy generation, which is associated with global climate regulation, are processes with high levels of dependency and low impact on activities (Figure 5). In turn, the energy transmission and distribution processes have high impact, despite a moderate dependency.

**Figure 5 - Impact and Dependency Ratio for the Global Climate Regulation Service**



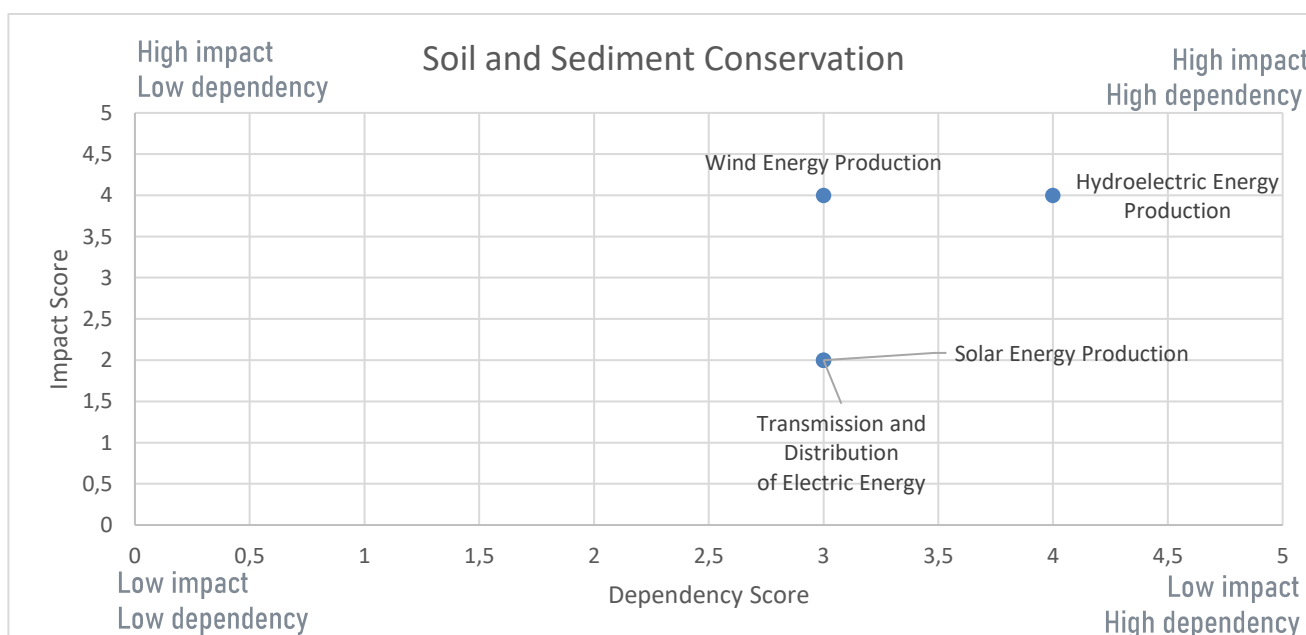
On the micro and meso scale, the hydroelectric energy generation step had high dependency and high impact relating to climate change, being a priority for mitigating and assessing services (Figure 6). The solar and wind energy production processes had high dependency and low impact associated with this item.

**Figure 6 - Impact and Dependency Ratio for the Local Climate Regulation Service**



The hydroelectric energy generation step had high dependency and high impact relating to the Soil and Sediment Retention service, being a priority for mitigation and assessment. Wind energy production processes had moderate dependency, but high impact, while the energy transmission and distribution activities had low pressure and medium dependency (Figure 7).

**Figure 7 - Impact and Dependency Ratio for the Sediment Retention Service**



Based on these results, it is important that actions are directed towards reducing the generated impacts, such as recovery of degraded areas and initiatives to control climate risks and carbon footprint, which are necessary to ensure the benefits of the ecosystem services for the Company's internal and production processes, as well as market benefits arising from the global relevance of the theme. These measures and the actions taken in the assets' influence region are also beneficial for the operations.

#### **4 - Final Considerations**

Hydroelectric energy generation emerges as the top priority when carrying out an integrated analysis of impacts, dependency and ecological sensitivity materiality. This type of generation has the greatest challenges both in terms of environmental impacts and dependency on natural resources, particularly due to the need for large volumes of water and the interference with sensitive ecosystems.

Identifying the energy sector's dependency on ecosystem services is a crucial step to mitigating potential negative effects on the environment and, consequently, on the actual production chain. After completing the assessment, we can clearly see the relevance of the contributions from the ecosystem relating to resources for climate and soil regulation.

In this sense, it is crucial to adopt an integrated approach that analyzes processes across the value chain, aimed at reducing impacts and strengthening the operation's resilience. This includes optimizing processes to reduce consumption of resources, strengthening environmental control and monitoring, and applying proactive measures at the highest levels of the mitigation and conservation hierarchies. These actions are in line with the control measures and positive actions already developed by Cemig. By identifying the highest ecosystem-related dependencies, improvement opportunities appear to further improve these initiatives in a targeted way, thus focusing on addressing the dependency-impact nexus within a double materiality framework.

These actions are aimed at not only mitigating the impacts but also building an operating model that is more sustainable and resilient to environmental changes which, amidst climate and biodiversity crises, have been occurring increasingly intensely. This approach also strategically positions the Company in relation to sector and global commitments adopted to advance to meet the goals of the Global Biodiversity Framework.

The main findings of this diagnosis have been incorporated into Cemig's Biodiversity Action Plan, whose were elaborated within the scope of the project.