**Question 1.1.** The SIGS offers a set of indicators useful to compare, using an overarching approach, different generation technologies to be used in the assessment process of system expansion scenarios. The paper reports the final scores achieved by each technology considered along the different dimensions (i.e., environmental, social, economic, political). In the examples given, some of the indexes appear to be dimensional values (e.g., km2 /MWh), while some others are more qualitative scores (1 to 5). **Can the authors elaborate on the methods followed to combine such different types of indices into a single comprehensive indicator?**

Indicators allow the options of different generating sources to be compared, since they are numerical representations of variables that are not directly observable and are able to identify the environment, allowing predictions and interpretations of the impacts that will occur, thereby enabling the measurement of biotic and anthropic factors. The proposed indicator system involves dimensional value indicators and others of a qualitative nature. In the second case, to produce the score, a set of binary variables is associated to an indicator and a scale is developed to evaluate the results. For example: one indicator may be evaluated by the presence of three characteristics. If none of the characteristics is present, the score of the indicator is 0. If two are present, the value is 0.5. If the three characteristics are present, the score of the indicator is 1. This allows a safe comparison between indicators of a different nature.

**Can the authors shed light on the ranking of importance of the criteria adopted (i.e., the relative importance of social impacts vs. economic impacts)?**

For this work, the null method was used, i.e., the same importance was attributed to all dimensions, themes, aspects and indicators. This is a non-statistical method of weighting indicators and is justified by the following arguments: (i) the technical method may bring biases relevant to the results, because it is very dependent on the subjectivity and profile of the specialists who assign weights; (ii) as the index created is a pioneer in Brazil, there is no bibliographic reference to support a weighting system; (iii) in a complex context such as the sustainability of different sources of electricity generation, it would not be advisable to use weight assignment through public opinion research; (iv) in addition, the literature shows that the assignment of weights has caused more problems than the use of the null method.

Nonetheless, the developed software allows the weighting of all socio-environmental aspects, themes and dimensions. For example, when evaluating a hydroelectric power project in the Amazon Region, greater importance should be given to environmental impacts, in relation to those of the social and economic dimensions.

**How can one weigh and compare the different dimensions? In the approach presented, each generation technology ends up being characterized by a SIGS score: how is the difference among several possible plants using a similar technology taken into consideration (e.g., old generation plant vs new generation plant using similar technological principle)?**

The Index was built to enable comparisons between different sources of electricity generation, in terms of their level of sustainability. Power plants with different types of generations but using similar technological principles, may be considered as different technologies, since their

impacts may significantly differ. For example: coal thermal plants and coal thermal plants using combined cycle technology (different generations) have very different impacts on nature. It is important to highlight that the results presented must be permanently updated, so as to incorporate the technological innovations of the generation sources and thereby allow more realistic comparisons.

**How far can the results obtained be representative for other countries?**

The results of the proposed tool in question reflect the Brazilian reality and it may be applied in other countries by adapting the indicators to their different realities. The assessment of the environmental impacts produced by the implementation of energy sector enterprises lacks a minimum of deepening of both the actions of the impactor and the characteristics of the environment that will receive it, which varies between nations.

**How spread are the values for different plants located in different parts of the country?**

The SIGS has been created to be used in any region of the country. As a planning tool, its indicators reflect the general impacts of each generation source. It should be noted however, that many indicators are common to several or even all enterprises of the same type of generation source or of a different source, while others are quite specific, since they are focused on characteristics that are unique and relative only to the biotic and/or anthropic environment in which a given power plant will be located. Therefore, indicators with high specificity have been strategically left out, allowing the resulting indexes to reflect the sustainability of the sources, regardless of their location in the national territory. However, it is possible to incorporate specific impacts into the indicator system to analyze different plants in different regions of the country.

## REFERENCE

RAMOS, D.S. PEREIRA JR., A.O.; SILVA, A.L.R.; MOROZOWSKI FILHO, M.; FURTADO, R.C. Planejamento Energético: Inserção da Variável Ambiental na Expansão da Oferta de Energia Elétrica. 1 ed. Rio de Janeiro: Synergia, 2020.