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DEVELOPING THE SUSTAINABLE DEVELOPMENT GOALS THROUGH A TRIPLE HELIX STRUCTURE: THE CASE OF A RESEARCH CENTRE IN BRAZIL

Practical case

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Abstract text:

Overview

The United Nations (UN) has developed the 2030 Agenda, proposing 17 Sustainable Development Goals (SDGs) and 169 associated targets to address relevant issues on sustainability and the quality of life (Sachs et al., 2019). The oil & gas sector has been challenged to make efforts to provide cleaner and affordable energy, at the same time as it reduces greenhouse gas emissions from the production and use of fossil fuel. Together with other carbon dioxide (CO₂) large emitters as industry and power production plants, these emissions are the leading cause of global warming and require climate action. This commitment towards SDGs, aligned to Paris Agreement, both launched in 2015, is to hold temperature rises to no more than 2°C, preferably maintaining it below 1.5°C, based on scientific studies and evidence reasoning the threat of severe and irreversible damages otherwise (Global CCS Institute, 2019; IPCC, 2018).

However, these problems and questions comprised by the SDGs advocate to the complexity of technology development, economic progress, society's wellbeing, as well as environmental preservation. Reacting to that demand, industry together with the university, and sometimes government, have been partnering to work jointly on several actions such as developing energy sources and methods to reduce greenhouse gas emissions in a move towards a low carbon society (Nhamo, Odularu and Mjimba, 2020).

This paper aims to provide, insights into the capabilities of the triple helix (Leydesdorff and Etzkowitz, 1996) relationship among university, industry and government to promote sustainable growth and to foster development that contributes to the achievement of the Brazilian Agenda 2030 targets. To do so, this paper explores the potentiality of sustainable development through smart partnerships, presenting the case study of a Brazilian research centre born in a triple helix innovation model, from the partnership among the public University of São Paulo, funded by the government state of São Paulo agency (FAPESP) and the private company Shell. This study advances the analysis of the possible contributions of research centres, universities, companies and government agents to incorporate the SDGs within their outputs. These topics remain mostly unexplored and poorly understood. This discussion may inspire other research centres or triple helix constituents to align their efforts towards the SDG framework seeking to more effective involvement with the broad real-world problems.

Methodology

The centre named Research Centre for Gas Innovation (RCGI), object of this study, was established in December 2015 as an Engineering Research Centre, which is a FAPESP programme developed in partnership with a company, focused on open innovation through the dissemination of knowledge and technology transfer to the market by licensing and start-ups. Currently, the centre holds 46 projects under development by about 380 researchers, focused on innovation, aiming at the sustainable use of natural gas, biogas as well as hydrogen, and since 2017, it includes Carbon Capture and Storage (CCS) technologies to address greenhouse gases mitigation (Mascarenhas et al., 2020; RCGI, 2020).

The analysis of that centre aims to present a practical approach of a case study, mainly grounded on the description of qualitative data (Yin, 2018). The method used comprised of three steps: i) the gathering of a group of eight senior participants of the centre knowledgeable about the RCGI and its projects, as well as the SDGs, of which six were from the university and two from the oil & gas company, ii) the data collection through the group analysis of the objectives and outputs of the centre and its projects vis a vis the SDGs targets, iii) the data summary through a descriptive and analytical-deductive approach (Vaismoradi, Turunen and Bondas, 2013), supported by a literature analysis on university-industry-government collaboration, the SDGs and the Brazilian energy and oil & gas sector.

Results

Results of such analysis demonstrate the alignment of RCGI and its projects towards the SDGs, mainly the SDG#7 (cleaner and affordable energy to all) and the SDG#13 (climate mitigation) which are directly related to the mission and vision of the centre. The actions of the RCGI enable impacting many more SDGs, to mention a few, the SDG#17 (partnership) represented by the triple helix structure in which the centre is established, and the several national and international collaborations, the SDG#4 (education) through the pillar of the dissemination of knowledge, the SDG#9 (industry innovation and infrastructure) as the projects develop technologies for the industry, with relevant spillovers on SDG#3 (health) as the technologies aim to improve the quality of the air.

Some remarks of this study are:

- The SDGs are a framework capable of orienting research and development, although research projects need to reach implementation for them to provide a real contribution to the goals.
- Universities and research centres enable the development of knowledge to be applied, but the triple helix structure boosts the effective implementation through industry market approach and government support.
- Lessons learned show the relevance of working together with society to implement projects and technologies that impact in the local territory and livelihood environment.
- Long-timeframe research, as the projects held in the centre, can benefit by aligning their efforts towards the SDGs, creating a sustainability mindset.
- Dissemination of knowledge about the SDGs is needed for all whether for government, industry, academia, media or society.

Conclusion

The study demonstrates the relevance of the SDG as a framework to direct research, development, commercial application, legislation and all approaches based on a sustainability mindset. The triple helix is a model that has the potential to advance innovation into the market and contribute towards the achievement of the Agenda 2030 targets proposed by the UN, as it enables knowledge developed in the university or research centre to be applied in the market through support from industry and government. The study can be widely utilized as a first step to align and involve everyone from academy, industry, government, media and society in the understanding and pursuit of sustainability.

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Owner:

The RCGI – Research Centre for Gas Innovation appears as a world centre for advanced studies on energy transition for the sustainable use of natural gas, biogas, hydrogen and management, transport, storage and usage of CO₂. The centre, based at the University of São Paulo, is the result of FAPESP partnerships in support of high-level scientific research for the development of the energy sector. Its activities are based on three pillars: research, innovation and dissemination of knowledge.

The RCGI brings together a team of researchers from various fields of science and technology for the development of the gas and energy industries. The projects are structured in five research programmes: Engineering, Physical-Chemistry, Energy Policies & Economics, CO₂ Abatement and

Geophysics. With the integration of researchers and the complementarity of their programmes, the RCGI offers innovative solutions to the technological problems on energy transition related to natural gas, biogas, hydrogen and CO₂ emissions as well as providing support for the improvement of energy policies in the State of São Paulo, in Brazil and worldwide. In particular, it intends to increase the competitiveness of the industry of São Paulo and inform society of the enormous economic potential in the use of natural gas, biogas and hydrogen as sources of energy in the years to come.

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Geographical origin:

Brazil/ Latin America / São Paulo

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SUSTAINABLE DEVELOPMENT GOALS

