ENERGY TRANSITION AND O&G INCUBENTS ENGAGEMENT

[Luciano Felipe Rodrigues, Pontifical Catholic University of Rio de Janeiro, +55 (21) 99711-0123, lucianofcr@hotmail.com]
[Renata Peregrino de Brito, Pontifical Catholic University of Rio de Janeiro, +55 (21) 2138-9309, renata.brito@iag.puc-rio.br]
[Naielly Lopes Marques, Pontifical Catholic University of Rio de Janeiro, +55 (21) 2138-9354, naielly.lopes@iag.puc-rio.br]
[Alessandra Costa, Pontifical Catholic University of Rio de Janeiro, +55 (21) 99251-7211, alessandra.costa@iag.puc-rio.br]

Overview

In the global climate change emergency, a key axis for mitigation is associated with the energy sector, which accounts for 77% of global greenhouse gas emissions. Energy Transition refers to the worldwide urgency of replacing fossil energy sources with renewable ones and reducing emissions. The central issue in energy transition is related to timing and dynamics. The pace of a fast or slow transition has important implications for the adaptation process, starting from the perception of changes, the opportunities seized, and the capacity for transformation of the organizations (Sovacool, 2016; Teece, 2014). In this context, incumbent companies in the oil and gas sector find themselves at the center of this strategic discussion since this sector accounts for 50% of global energy demand and is focused on fossil energy sources.

This study aims to clarify the factors that precede the engagement in the energy transition by incumbent companies in the oil and gas sector (O&G), making them overcome organizational inertia and adopt strategies that lead them to adapt to the changing global scenario that this sector is going through. For O&G firms, the path-dependent investment process, high capital intensity, and long lead times lead to higher associated costs for changing than other industries (Hartmann, Inkpen, and Ramaswamy, 2021).

The literature on incumbent companies' adaptation to disruptive or sudden changes has focused on technological discontinuities and another type of phenomenon defined as radical change (Mckinley, 2022). In such cases, the environment turbulence demands faster and more profound changes by incumbents (Khanagha et al., 2018). Yet, the contingency approach to organizational adaptation argues that there is no single formula for adaptation, but rather the need for contextual and environmentally sensitive adjustment

In this sense, more incremental and cumulative phenomena, such as the energy transition, lack a theoretical framework for analysis, especially when analyzing the role of incumbents in the oil & gas sector in this dynamic. For such purpose, this study analyses the antecedents that determine the engagement of incumbent O&G companies in the energy transition. More specifically, regional diversification, upstream focus, R&D investment, and financial slack are hypothesized to influence engagement in the energy transition.

Methods

This research proposes a longitudinal empirical study (2017-2022) and a broad database. Information was extracted from the Evaluate Energy database. The presence of the 20 largest companies in the oil & gas sector, according to the FORBES ranking (2024), was verified for sector representativeness. A comparison was also made with the sample by Hartmann, Inkpen, and Ramaswamy (2021). Finalizing in a sample of 168 companies in the oil & gas sector, with state or private control, representing a total revenue in 2022 of US$ 3.0 trillion, representing 90% of the US$ 3.3 trillion market (Rystad Energy, 2023). To assess the impact of the Paris Agreement, data were collected from 2015-2016 as a baseline period I and 2017-2022 as a comparison period II for companies' engagement.

Engagement in renewable strategies, the dependent variable, was measured as the percentage of CAPEX in renewable energy. Based on the calculation of this percentage, the sample was divided into two groups: one that 'engages' in the energy transition, represented by those with above-average CAPEX percentages, and another that 'does not engage' in the energy transition, represented by those with below-average CAPEX percentages. Regional diversification, the importance of upstream, R&D intensity, and financial slack were tested as independent variables. In addition to the independent variables, the model considered the following control variables: net revenue, capital employed, and percentage of state control. The final sample is concentrated in 137 private companies (82%).

Results

Analyzing the timeline of the percentage of investment in renewable energy by incumbents in the O&G sector, an evolution is observed between periods I and II, with the growth of engagement in the energy transition. Thus, the number of engaged companies grew from 52 (31%) to 56 (33%) companies. In addition, there was a 25% growth in the level of capex in renewable energy (0.03 in period I to 0.04 in period II).

The statistical analysis revealed marked differences in engagement in the energy transition between state-owned and private companies, especially in period II, which was considered the focus of the study. The statistical significance (p-value <0.01) identified in comparing the variable 'Engages' between the two types of shareholding control suggests a substantially greater engagement of state-owned companies compared to private companies.

The analysis of the models indicates empirical support only for Hypothesis H2 – Incumbent companies in the oil & gas sector with greater importance in the upstream sector have greater engagement in the energy transition than the industry average. There was no empirical support for the hypotheses about the relationship between engagement in the energy transition and variables such as regional diversification, R&D intensity, and financial slack.

Conclusions

The scenario revealed by the results suggests a very pragmatic perspective where, paradoxically, "only those who do not have oil reserves" fully engage in the energy transition. Organizational inertia suggests that established companies often resist disruptive changes due to entrenched structures and processes (Vergne and Depeyre, 2016). In the oil & gas industry context, this resistance can be even more pronounced due to the significant investment in infrastructure and technology focused on fossil fuels. This inertia is reinforced by the perception of security and predictability in the financial returns of known oil reserves, compared to the risk associated with investments in renewable technologies, which are still evolving.

This study updates empirical studies already in the post-Paris agreement context, also noting the effect of this agreement on the engagement of incumbent companies in the oil & gas sector in the energy transition. It also contributes with a multi-year view of the data, an approach more appropriate for a long-cycle industry, such as oil & gas. Using actual data on engagement in the energy transition demonstrates the gap between the discourse and practice of incumbent companies in the oil & gas sector regarding engagement in the energy transition.

Although representative, this study was limited to the sample, which does not cover all cases of incumbents in the oil & gas sector. It also exclusively represents companies with public information, which is not the reality of a significant portion of incumbent companies in the oil & gas sector, notably those under state control.

References

Hartmann, J., Inkpen, A. C., & Ramaswamy, K. (2021). Different shades of green: Global oil and gas companies and renewable energy. *Journal of International Business Studies*, *52*, 879-903.

Khanagha, S., Ramezan Zadeh, M. T., Mihalache, O. R., & Volberda, H. W. (2018). Embracing bewilderment: Responding to technological disruption in heterogeneous market environments. *Journal of Management Studies*, *55*(7), 1079-1121.

McKinley, W. (2022). Doomsdays and new dawns: Technological discontinuities and competence ecosystems. *Academy of Management Perspectives*, *36*(2), 729-743.

Rystad Energy. (2023). *Global Upstream Oil & Gas Outlook 2023-2027*. Oslo, Noruega: [s.n.].

Sovacool, B. K. (2016). How long will it take? Conceptualizing the temporal dynamics of energy transitions. *Energy research & social science*, *13*, 202-215.

Teece, D. J. A dynamic capabilities-based entrepreneurial theory of the multinational enterprise. Journal of International Business Studies, jan. 2014

Vergne, J. P., & Depeyre, C. (2016). How do firms adapt? A fuzzy-set analysis of the role of cognition and capabilities in US defense firms' responses to 9/11. *Academy of Management Journal*, *59*(5), 1653-1680.