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ENCONTRO EFS 22

ALUNOS ♦ EMPRESAS

Evaluating the Impact of the Accession to the OECD and other Key Drivers on the Future of the Brazilian Electricity Sector

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Graduated with degrees in Civil Engineering (UFPR/1994) and Law (PUC-PR/1997). Holds postgraduate degrees in Technical Management of Electric Utilities (UFPR/1996) and Theory and Operation of a Modern National Economy (George Washington University/2015) and a Masters Degree in Hydraulics Engineering (UFPR/1999).
Senior Regulation Specialist at the Brazilian Electricity Regulatory Agency (ANEEL) and former Visiting Fellow at the Florence School of Regulation (RSCAE/EUI – Florence 2019/20).

Main research interests: Electricity; Brazil; OECD; Scenarios; Drivers; Regulation.

Motivation and Objectives

- The near future of the Brazilian Electricity Sector is relatively well known – it is and will stay an example of sustainability.
- However, the long term outlook might present very different outcomes, depending on the behavior of the ongoing energy transition's main drivers.
- One of those possible drivers is Brazil's accession to the OCDE, which might put the country in a different level of growth and demand for electricity.
- Multiple methods supported the identification of the important drivers and, among them, the critical ones.
- The conclusions may be broadly used, especially in the public policy and regulatory environments, to calibrate the energy transition groundwork and implementation efforts.

Work plan

Narrative review
- PNE 2050
- International outlooks
- Selected papers

Meta-synthesis
- 3Ds
- Preliminary set of drivers from the meta-synthesis

Experts' selection
- 2,846 invited experts
- Public policies and regulation
- Sector companies
- Academia
- Independent professionals

Delphi - First Round
- 294 responses
- Validation of the set of drivers
- Validation of the criteria
- Elicitation of parameters for the MCDA

Delphi - Second round
- 102 responses
- Feedback
- Drivers prioritization
- Evaluation of the drivers and OECD

Delphi - results
- Consensus
- Stability
- Analysis

MCDA - ELECTRE-TRI
- Sorting of the drivers in three groups (important, very important and critical)
- Placement of the driver OECD

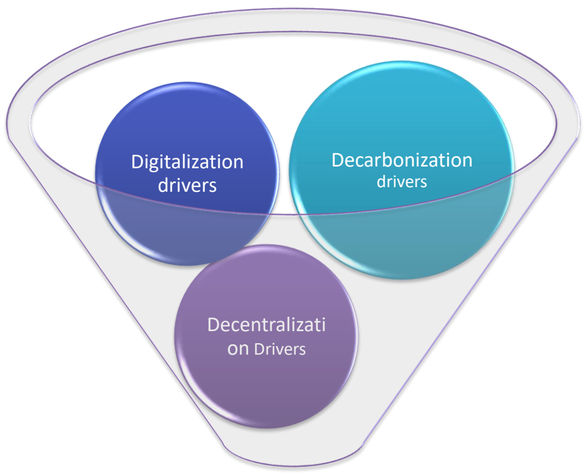
Results

IMPORTANT DRIVERS
- Role of natural gas
- Artificial intelligence
- Hydrogen
- International integration
- Cybersecurity
- Biofuels
- Big data
- Communication & information technologies
- Carbon capture, use, and storage

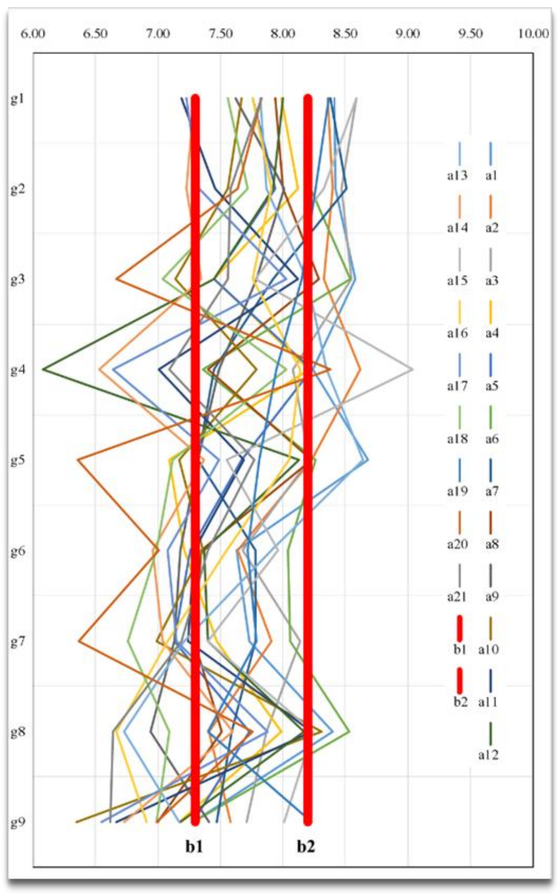
VERY IMPORTANT DRIVERS
- New business models
- Smart grids
- Role of hydroelectricity
- Demand management and response
- Electric vehicles
- Consumer behavior
- Brazil's accession to the OECD

CRITICAL DRIVERS
- Distributed energy resources
- Evolution of storage technologies
- Energy efficiency
- Penetration of solar and wind sources
- Electrification
- Greenhouse-gases emissions

Brazil's energy transition through 2050



Important drivers



Methodology and Methods

Narrative Review
Exploratory investigation of the literature to obtain in-depth qualitative insights

Meta-Synthesis
Used to filter the many drivers obtained from Brazil's long-term planning and selected international outlooks

Delphi
Dozens of specialists converged about the important drivers and their performances across nine criteria

MCDA
ELECTRE-TRI was used to sort the drivers among three categories

OCDE
This driver's performance was compared with the category profiles in order to place it in a specific group

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