

## Flexibility and resilience for long-term variability

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Federal institution, part of the structure of the Ministry of Mines and Energy



We develop energy planning studies and statistics to support formulation, implementation and assessment of the national energy policy



Member of the National Council for Energy Policy (CNPE)

### **Summary of Brazilian Power System**





- Continental size country with an interconnected power system
- Growing demand
- Cost-based dispatch

- Majority hydro power system
- More than 80% of installed capacity from renewable sources

### In 2020/2021 Brazil faced the most severe drought





#### Hydropower Reservoirs Level



Source: Brazilian ISO (ONS)

Brazilian ministry coordinated several short-term actions to guarantee electricity supply, such as:

Demand Response Program

**Hydro Inflows** 

- Emergency power generation procurement
- Operational strategy to preserve reservoir levels

# And what did we learn in this period to improve expansion planning studies?

### The challenge to deal with the minimum (necessary) generation

23.064





14.135

Total







#### Key messages



1. Real-life changes are faster than our capacity to keep them update in mathematical models

> It is necessary to pay attention in what kind of data we need to, eventually, simplify to get more accurate results





# 2. Integrated view and assessment

Decisions in different sectors impact power system (and will impact more and more). And different stakeholders have different preferences 3. Rethink the role of strategic sources for the system

Is the market design fitted to remunerate critical services?



## Thank you!

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