

Paris Session 2022



Resource Adequacy Studies Applied in Brazilian Power Market

SC5

PS2 – Q1 - How are short, shallow, and frequent events distinguished from long, deep, and rare (low probability high impact) events and factored in the resource adequacy studies? Considering the large amount of data associated with resource adequacy studies, how are visualization and stakeholder communication challenges handled?

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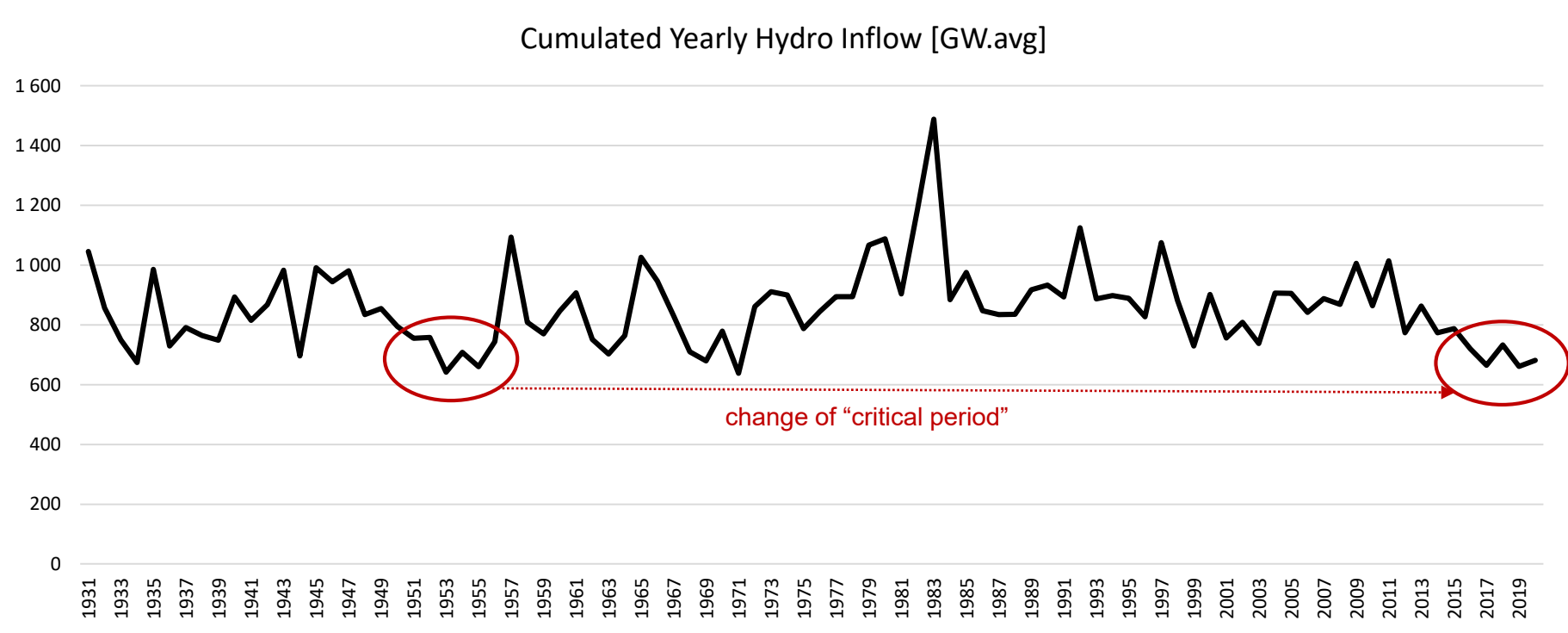
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The capture of important uncertainties is a common sense in resource adequacy studies applied in Brazilian power market

- The Brazilian power system has been handled typical features, such as hydro-based generation, long distance lines and permanent load growth, which intrinsically has been considered a large set of uncertainties in the operation and expansion
- Better approaches to deal with uncertainties is well developed in Brazilian power markets and is also included in “grid procedures” and planning criteria
- Concerning visualization and stakeholder communication of resource adequacy studies, all of important criteria and results for planning and operations are submitted to public hearing
- Market agents can add change requests and improvements. Hence, the public hearing administrator (minister of energy or regulator) can accept or not

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Hydro is still a large resource, and a good example is the consideration of variations of inflows in hydro plants



Hydro inflow sequences are collected since 30's and large set of variations are considered in resource adequacy studies to define the best balance of supply - short, mid and long-term applications

A recent example is the change of "critical period" which is currently submit to a public hearing

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Recently capacity market adequacy studies have been officially developed by power authority (minister of energy and planner)

Suggestion of improvements are given in the Paper 10172: Application of Capacity Market Mechanisms – Security & Resilience for Brazilian Power Markets

- The security targets approved by National Council of Energy must be calculated by “reliability simulations” to capture the new capacity request of controlled sources to variations on power supply
- The uncertainties must be fully considered in the “reliability simulations” through significant data, such as:
 - Hydro power capacity due to the reduction in net head in reservoirs
 - Hydro power capacity due to the large variations of inflow on run-of-river plants
 - Intermittencies on capacity of renewables
 - Outage and maintenance of hydro and thermal units
 - Load curve