

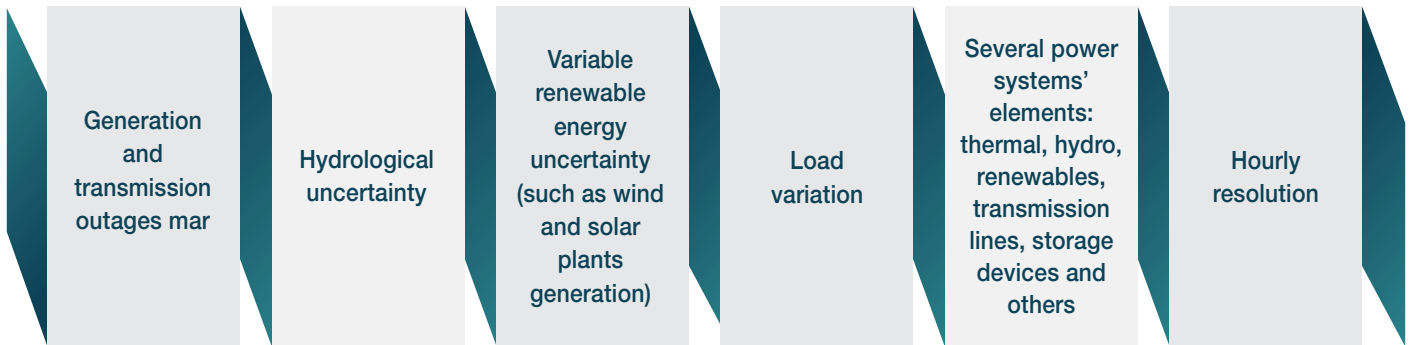


PSR

CORAL

OVERVIEW

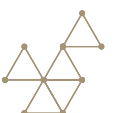
The **Coral** is a reliability tool that evaluates the composite (generation-transmission) supply reliability of large-scale power systems, taking into account:



METHODOLOGY

A **novel** pseudo-sequential Monte Carlo method (called Monte Carlo Pseudo Interval Sampling) is used to represent the states of generation, transmission, load, hydro capacity and renewable production, incorporating the chronology of storage devices, such as batteries, using hourly discretization.

For each selected/sampled state, a linearized optimal power flow is used to identify operating constraint violations and apply corrective measures. The severity of supply shortfalls is represented as the minimum load curtailment required to eliminate the operating constraint violations.



RELIABILITY INDICES RESULTS

The results produced by Coral are in CSV-format files. These files are managed by a graphical inter-face (GRAPH program) which processes the desired results, making it possible to evaluate in detail the system reliability indexes through the advanced statistics, or even the use of the PowerView tool to analyze the results in a georeferenced or schematic way. All the results of the model are available in hourly resolution. The main results produced by CORAL are:



Reliability indices such as LOLP, EENS and LOLE by bus



The expected bus-level marginal impacts of generation and transmission reinforcements

Coral runs on Windows and Linux based PCs. It can be executed sequentially or using a distributed architecture, taking advantage of the parallel computing. It is also available in the PSRCloud platform.

INTERFACES WITH PRODUCTION SIMULATION AND EXPANSION PLANNING MODELS

Coral has automatic interfaces with two PSR models:

SDDP

A chronological production simulation model which represents in detail hydro scheduling and other renewable resources, the power transmission network and the natural gas pipelines.

OPTGEN/NETPLAN

A generation/transmission expansion planning model with supply reliability constraints

USES OF CORAL

Coral has been used in studies for renewable integration, planning and operation reliability in several countries, such as Argentina, Brazil, Colombia, Costa Rica, Uruguay and others.

Coral has been used by the Load National Dispatch Center of Panama (CND), with the collaboration of PSR, to determine the reliability reserve of the Panamanian system.

