antaressimulator

SHEDDING LIGHT ON THE FUTURE OF THE ENERGY SYSTEM

DISCOVER THE ANTARES-SIMULATOR!

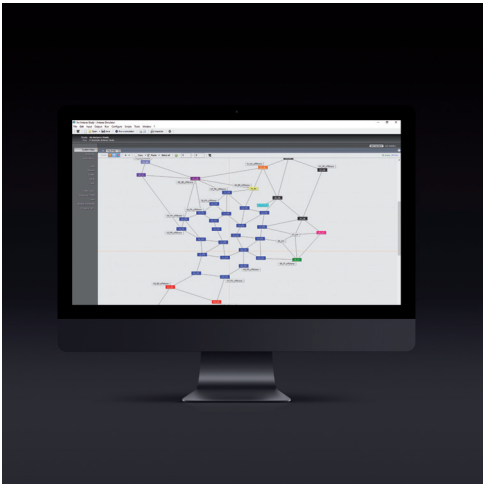
AN OPEN SOURCE SOFTWARE WHICH QUANTIFIES
THE ECONOMIC PERFORMANCE, SECURITY OF SUPPLY
AND ENVIRONMENTAL IMPACT OF POWER SYSTEMS.

EXPLORE EVALUATE ANALYSE ASSESS

Explore prospective visions of the energy sector | **Evaluate** the impact of a given energy policy on the generation mix | **Analyse** the costs and benefits of a new generation or interconnection project | **Assess** the level of security of supply of the upcoming years

ANTARES-SIMULATOR, AN OPEN SOURCE SOFTWARE TO SIMULATE YOUR SUSTAINABLE ENERGY TRANSITION

The massive development of intermittent renewable energies, the multiplication of local smart grid experiments, and the assessment of the potential of storage technologies (batteries, power-to-gas) are typical examples of strategic issues whose analyses require the assistance of a software application such as **Antares-Simulator**.



ANTARES-SIMULATOR IS AN OPEN SOURCE SOFTWARE which can be downloaded free of charge, installed on any local computer or server and used without any limitations.

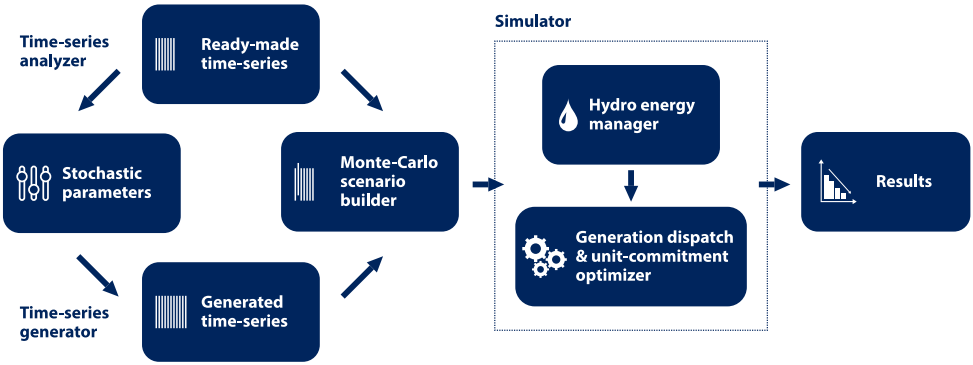
- Cross-platform source code (Windows, Unix, Linux systems) is available on GitHub.
- OS-specific installer packages are available on the Antares-Simulator website.

A REFERENCE SOFTWARE FOR ENERGY ACTORS

RTE, the largest Transmission System Operator (TSO) in Europe, initially developed the tool end-to-end for internal purposes and now continuously improves and enhances its capabilities. Alongside RTE, other TSOs, consultants and academics make extensive use of Antares-Simulator.

TSOs, power producers, regulators, academics, consultants, NGOs and all other actors involved with energy policy issues are welcome to download the Antares-Simulator software for free. By subscribing to the **Antares User's Club,** one can also benefit from services such as software maintenance or trainings.

FUNCTIONALITIES COVERED BY ANTARES-SIMULATOR



POWER SYSTEM MODELLING AND HYDRO-THERMAL DISPATCH OPTIMIZATION

Representation of a large system in the form of a graph involving up to a few hundred country-sized or region-sized nodes, linked together by edges

Modelling of thermal units, seasonal hydro reservoirs, storage systems, and intermittent generation

Construction of Monte-Carlo scenarios embedding several possible hourly time series of electrical demand, intermittent wind and solar generation, hydraulic inflows and availability of thermal units

Simulation of the seasonal management of hydroelectric reservoirs

Week-ahead system-wide unit-commitment, computation of the optimal (least-cost) hydro-thermal dispatch and inter-regional exchange schedule. Week-ahead hourly optimization of generic power storage facilities

Unit commitment involving the three major constraints bearing on the operation of thermal plants: minimum power generated in stable conditions, minimum "on" and "off" durations

Assessment of the unsupplied energy due to generation shortages or grid congestions and power spillage associated with amounts of energy that could be generated at no additional cost but cannot be used

Flow optimization in the conventional DC OPF approach. Modelling of active power regulation devices (such as phase-shifting transformers) and DC lines

STOCHASTIC DATA HANDLING AND CONSTRUCTION OF MONTE-CARLO SCENARIOS

Analysis of historical multivariate time-series to extract parameters that fit best correlated stochastic processes of specific kinds

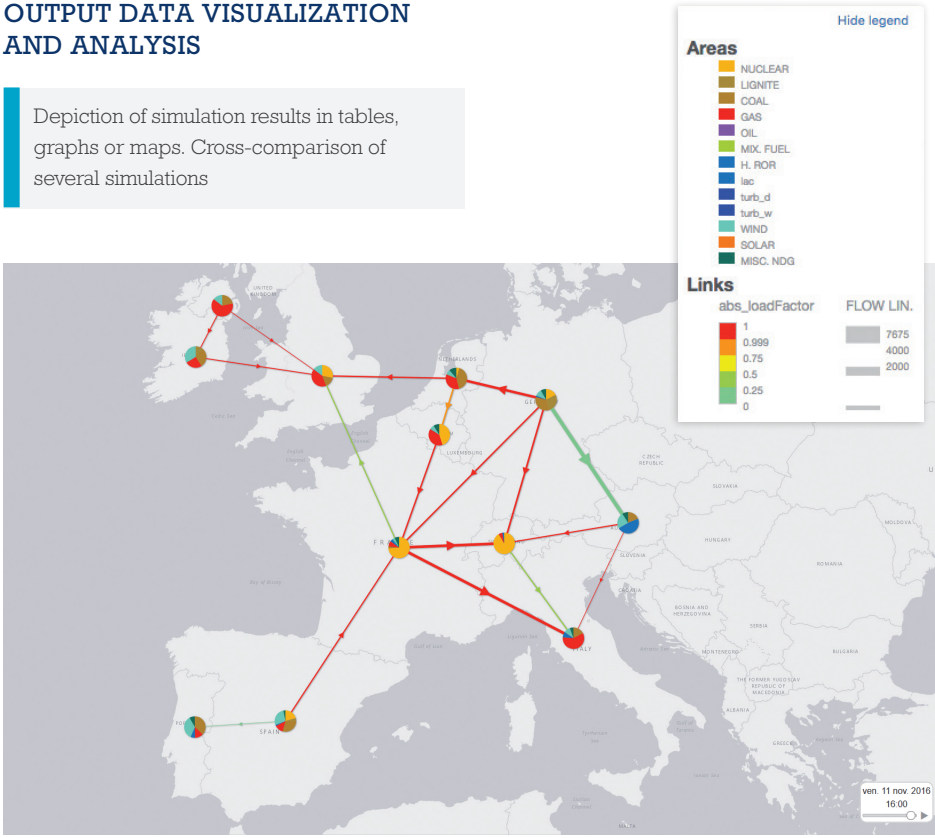
Uploading of external time-series for all types of scenario data, when available and preferred to software-generated data

Scenario construction under flexible rules: conventional Monte-Carlo, correlated draws, scenarios partly deterministic and probabilistic

Generation of bundles of time-series associated with specific stochastic processes whose auto-correlation, spatial correlation and marginal laws are known. Generation of times-series of available power for thermal plants through simulation of forced as well as planned outages

OUTPUT DATA VISUALIZATION AND ANALYSIS

Depiction of simulation results in tables, graphs or maps. Cross-comparison of several simulations



REFERENCE STUDIES

Antares-Simulator provides the software basis on which the French Generation Adequacy Report is based. The tool has also proven efficient in a variety of contexts, including the establishment of the European Ten-Year Network Development Plan (TYNDP) report under the responsibility of ENTSO-E, the European Network of Transmission System Operators. Other European projects like Osmose or E-Highway 2050 – whose highly demanding requirements regarding calculation performances are adequately met by Antares-Simulator software – illustrate the wide basis of potential usages.

More information about the software and free download links to its installer:
https://antares-simulator.org

Contact us:
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