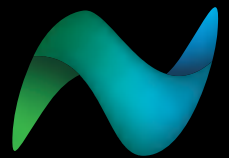


CREATING A SMART ENERGY FUTURE



R&D
NESTER

OUR VISION HAS NO BOUNDARIES, KNOWS NO LIMITS.
IT IS THE ESSENTIAL DRIVE THAT INSPIRES PEOPLE
AND CHANGES THE WORLD.





The world is facing unprecedented challenges and opportunities in the energy sector. A sustainable energy future requires a new thinking, new technologies and new solutions - it needs a transformation in the way energy is produced, stored, delivered and used.

R&D NESTER comes from REN, the Portuguese TSO, and State Grid Corporation of China's (SGCC) will to synergize core competences and create an R&D center, in order to promote and implement applied research, development, demonstration and testing, in an international environment, innovating for a smarter energy system.

At R&D NESTER we are fully engaged with tomorrow's clean energy systems, applying leading edge technologies and disruptive solutions towards more efficient, reliable and economic power systems.

Innovative solutions to future power systems

R&D NESTER acts on three independent vectors:

- Research, development, innovation and demonstration in the area of energy systems
- Consulting services in the scope of R&D activities
- Education and training services

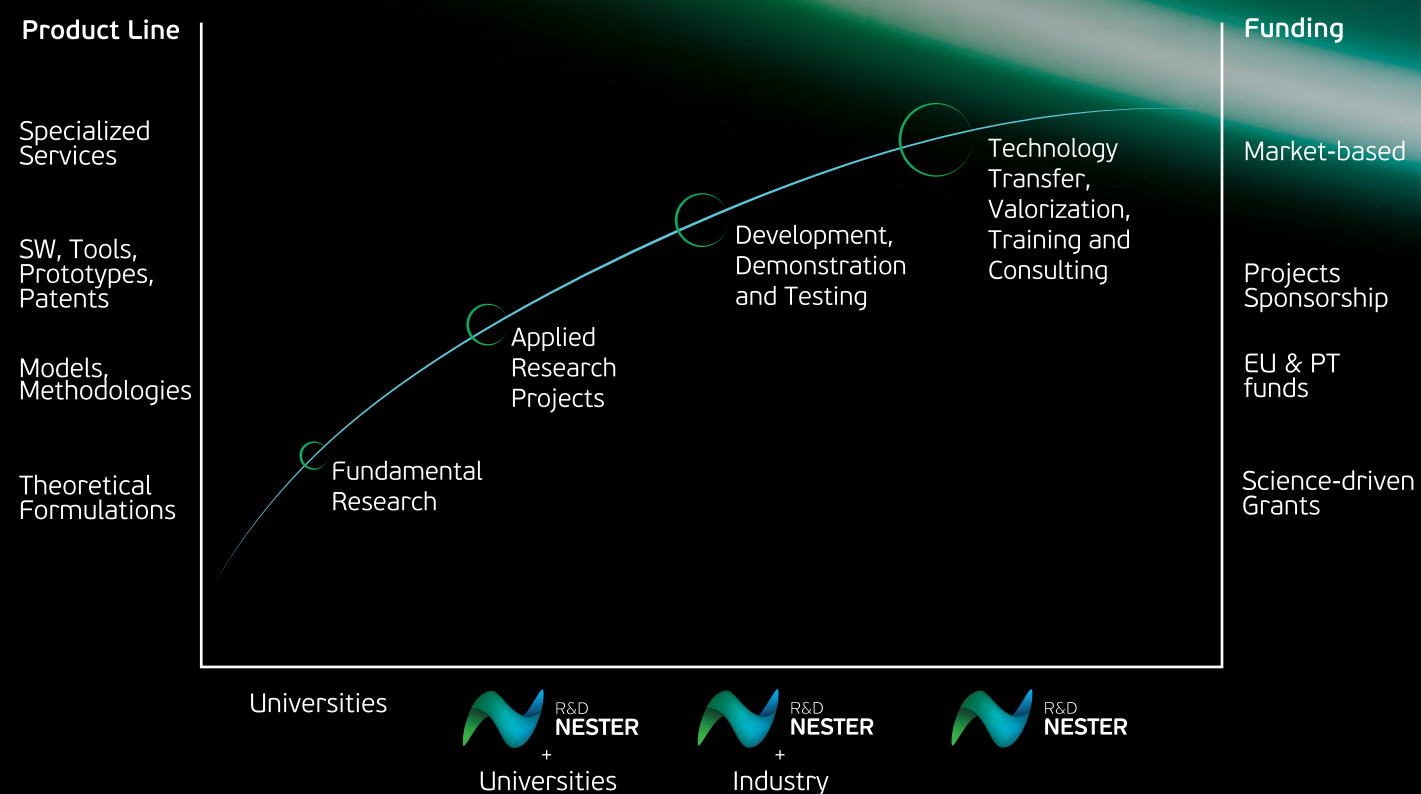
The R&D NESTER plays an active role in different stages of the R&D value chain from participation in applied research projects to the development of ready-to-market technologies.

Through a culture of innovation we provide an international platform for specialized knowledge, delivering disruptive solutions, approaches and methods to be applied into energy systems.

R&D NESTER develops new tools, strategies and processes, well-tuned to the new energy paradigm, and serving as a driving force to sustainable energy systems.

We are a R&D center certified in innovation, quality and environment.

R&D NESTER role among the R&D value chain



Present on the entire energy value chain, from generation to consumption

Our knowledge encompasses a variety of energy research fields, also possessing relevant expertise in innovation management systems and related processes.

Major research fields include power systems simulation, power systems operation and planning, renewable energy management, smart grid technologies and energy markets and economics.

- Power Systems Simulation:
 - Steady-state analysis; Transient stability analysis; Large-scale Power Systems analysis
- Power Systems Operation and Planning:
 - Smart Operation Tools; Optimal Network Planning; System Flexibility; TSO/DSO Interface
- Renewable Energy Management:
 - Renewable Energy Sources (RES) Forecasting; RES Dispatch; Grid Integration of RES
- Smart Grid Technologies:
 - Cyber-Security; Energy Storage; ICT Technologies; Interoperability; Super Grids; Smart Substations; Microgrids
- Energy Markets and Economics:
 - Demand Response; Market Operations; Novel Market Services; Reserve Tools; Market Regulation

Benefiting from R&D NESTER's shareholders structure of global power sector industry, the in-house expertise includes extensive industry hands-on experience, besides strong academic background.

Smart
Grid
Technologies

Power
Systems
Simulation

Renewable
Energy
Management

Power
Systems
Operation
& Planning

Energy
Markets &
Economics

Testing smart grid technologies in close to real environments

The Real Time Power System Simulation (RTPSS) Laboratory is ideal to leverage R&D NESTER core competences through state-of-the-art technologies.

It enables the simulation and testing of both power systems and communication networks, either in a stand-alone mode or by performing co-simulation.

Power Systems & ICT Co-Simulation Platform in R&D NESTER Laboratory

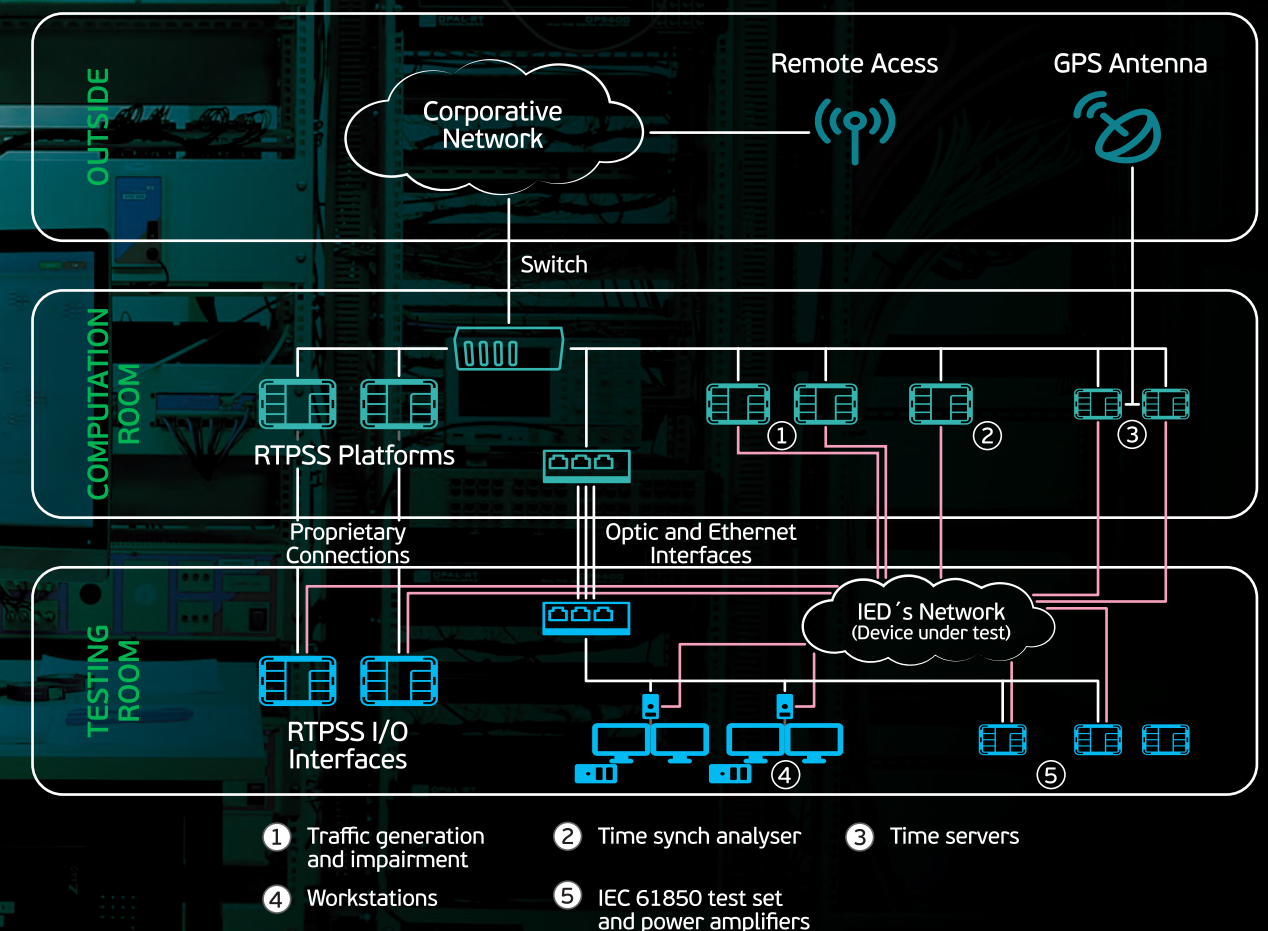


The major assets of the laboratory include Real Time Power Systems Simulators for power systems simulation and Hardware-in-the-Loop testing of physical devices. Besides, other relevant equipment existing in the laboratory includes:

- Communication network simulator and testing tools
- IEC 61850 specification, configuration and testing tools/equipment
- Time synchronization servers
- Power amplifiers

The communication infrastructure of the laboratory allows optical fiber and Ethernet connections, bringing great flexibility and allowing the test of devices such as IEDs or PMUs with great simplicity in a plug-and-play environment.

R&D NESTER Laboratory Architecture



Qualified researchers provide R&D NESTER's partners, from grid operator to industrial manufacturers, the opportunity to enhance the development and testing stages of their products and technological solutions in power systems and communication networks domains.

For additional information please see: <http://rdnester.com/lab>

Disruptive projects transforming the energy sector

R&D NESTER maintains a portfolio of projects in different energy fields in which collaboration with partners all over the world is key, transforming challenges into business opportunities and continuous improvements.

In innovation projects R&D NESTER cooperates directly with a variety of partners such as power system operators, industrial manufacturers or European institutions (e.g. EU R&D Program H2020, Interreg Europe, European Space Agency).

Some of the project areas R&D NESTER has been working on in recent years include:

- Substation of the Future
- Smart Substation Testing and Implementation
- Renewable Energy Management Tools
- Solar Energy Forecast
- Global Energy Interconnection
- Planning of Energy Storage in Electric Networks
- Integrated Supporting Services for the Wind Power Industry Demonstrator
- Nodal Capacity Planning
- Big Data for Energy Systems
- Flexibility Assessment in Power Systems

In such projects we aim to implement field solutions, such as in control rooms or substations, for the benefit of our partners.

R&D NESTER frequently publishes in international and recognized scientific journals and conferences in Europe, U.S. and Asia (e.g. IEEE or CIGRÉ) highlighting the advanced knowledge in our areas of activity.

For additional information please see:
www.rdnester.com/fields_and_projects

Achieving valuable collaborations with our partners

Aware of the importance of building long lasting relationships with stakeholders in the energy sector, R&D NESTER has celebrated collaborative partnerships with international R&D institutions, industrial partners and energy associations to thrive a global technology network.

At R&D NESTER we also have an active participation in several international and European working groups at prominent organizations which allow us to contribute and influence the clean energy systems of the future, while, at the same time, keep tracking of most innovative and state of the art technologies disrupting the energy world.

We look forward to further expand our global R&D network and engage with new partners for innovation. To find out more about R&D Nester don't hesitate in contacting us!

For additional information please see: http://rdnester.com/r_d_network





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