



SMART ENERGY GRIDS

Smart Energy Grids aim at integrating a high level of Renewable Energy Sources for decarbonizing the energy system while ensuring supply security (stability and flexibility) and keeping reasonable cost efficiency for users. Many challenges condition their deployment as energy grids are getting more complex with increasing share of intermittent production, with integrating both centralized and decentralized production and consumption and with continuous demand-response adaptation requirement. New strategies of management and control are thus necessary with new data exchange and communication protocols. Research in Smart Energy Grids combine very different modelling and simulation activities of various components such as energy generation

systems (solar, wind...), energy storage systems (batteries, hydrogen, thermal...) as well as energy conversion systems (fuel cells, power to gas, heat to power...). In addition, it requires developing reliable forecasting software for matching energy production and demand together with relevant management and big data treatment. Finally, tackling interoperability of distributed grids is a positive paradigm shift that relies on the development of advanced solutions for intelligent integrated energy systems.

CEA Tech is one of the few institutes able to carry competitively this type of R & D requiring multidisciplinary teams and know-hows, hard and soft research tools, internally and with forefront partners.

WHY A PHD RELATED TO SMART ENERGY GRIDS AT CEA TECH?

CEA Tech research program on Smart energy Grids combines technological and numerical approaches to tackle the development, management and optimal operation of such complex

systems.

PhD students will find at CEA Tech one of the largest public energy technology R&D infrastructure worldwide thanks to complementary technologi-

cal facilities: Solar Energy, Energy Storage, Hydrogen Energy, ...

They will have the possibility to work with world class teams on the management of smart grid, thermic system, and energy system components and to combine different energy vectors (electricity, gas and heat).

PhD students will also find at CEA Tech differentiating software platforms for smart energy systems simulations, fueled by recognized skills and strong industrial partnerships.



CEA-Liten Institute in Grenoble Alpes



10 ongoing PhD projects



CEATECH SCIENTIFIC AND TECHNOLOGICAL CHALLENGES

CEA Tech tackles the three key and ongoing transitions of the 21st century: numeric, energy and medical ones. For each, CEA Tech research teams innovates within a vibrant network of academic and industrial partnerships, to develop the technologies of the future.

CEA Tech, one of the four CEA research divisions, relies on three large research Institutes, two in Grenoble, Leti and Liten and one in Saclay, List, and a network of technology transfer facilities in Bordeaux,

Nantes, Toulouse, Metz, Cadarache and Lille.

Close to 500 young researchers, prepare their PhD in CEA Tech Labs, with a major contribution to the research teams. They share the successes of the CEA, embodied in leading publications, patents, technology transfers to industry, business and start up creation. For years, Reuters ranks CEA as one of the top three most innovative research organizations in the world (1st, 2nd or 3rd).

WHY A PHD AT CEA TECH?

Regardless of the field of research you are looking for, willing to explore prospective ideas or to further advanced technologie, you will likely find among CEA Tech doctoral positions the one that meets your expectations.

Then you can join either Leti (1800 p.) and focus on micro and nanotechnologies, embedded electronics, communications, components for the Internet of Things (IOT), cybersecurity, medical devices and healthcare outpatients (at Clinattec) - or Liten (950 p.) to face the challenges of non-CO2 emitting energies (solar, batteries, hy-

drogen, biomass or smart grids) - or List (750 p.) to innovate in terms of data intelligence, cybersecurity and IOT software, manufacturing (4.0 industries), radiotherapy, health data processing - or a research team located in one of the technology transfer facilities (Bordeaux, Nantes, Toulouse, Metz, Cadarache and Lille).

Whatever the topic you select, whatever the career path you envision, joining CEA Tech for your PhD has a deep meaning. On the one hand, you will be dealing with one major societal challenge, deeply rooted in science

and technology. On the other hand, your PhD will be at the heart of highly innovative ecosystems, each offering unique opportunities in research and career paths.

Indeed, CEA Tech offers a highly efficient mix of digital and hardware skills, world-class facilities such as state-of-the-art 300 mm clean rooms, and integration facilities for hydrogen and battery technologies, and many others. CEA Tech's teams form active partnerships with other research organizations and universities, as well as active cooperation with more than 500 industrial partners in France, Europe, North America and Asia.

We will do our best to accompany your success.



CEA-List Institute in Paris Saclay or CEA-Leti Institute in Grenoble Alpes or CEA-Liten Institute in Grenoble Alpes



500 ongoing PhD projects