DENSYS

MASTER ERASMUS MUNDUS | DECENTRALISED SMART ENERGY SYSTEMS

With the support of the Erasmus+ Programme of the European Union

Pioneering the Future of Energy Transition

To tackle global warming, transitioning to low-carbon energy systems is imperative. This involves integrating renewable energy sources, producing decarbonized energy carriers, and reducing emissions in energy end-uses to achieve the ambitious goal of a carbon-neutral world by 2050. These technological advancements must be accompanied by robust political frameworks that ensure large-scale implementation while fostering a just transition, a cornerstone of the European Green Deal to leave no one behind.

At the heart of this effort are decentralized smart energy systems, crucial for efficiently integrating renewable energy. This vision drives **DENSYS**. The program's overarching goal is to train highly skilled engineers with a multidisciplinary, multiphysics approach—spanning electrical, mechanical, and chemical engineering—equipping them to design, size, optimize, and manage decentralized smart energy systems while addressing societal needs holistically.

UNIVERSITÉ DE LORRAINE · KTH VETENSKAP OCH KONST · Politecnico di Torino 1859 · UPC UNIVERSITAT POLITÈCNICA DE CATALUNYA BARCELONATECH

What is DENSYS?

DENSYS is an **Erasmus Mundus Joint Master Degree** dedicated to the **Decentralised Smart Energy Systems,** supported by the European Union and developed in collaboration by:

- **University of Lorraine** (Nancy, France) - **Coordinator**
- **KTH Royal Institute of Technology** (Stockholm, Sweden)
- **Polytechnic Institute of Turin** (Turin, Italy)
- **Universitat Politècnica de Catalunya** (Barcelona, Spain)

DENSYS also involves **12 associated partners** to broaden students perspectives: **major industrial groups, start-ups and spin-offs, academic partners** such as ESADE Business School and the University of Liège (Belgium), ETH Zurich (Switzerland), **a regional research center, and an association of European research organizations.**

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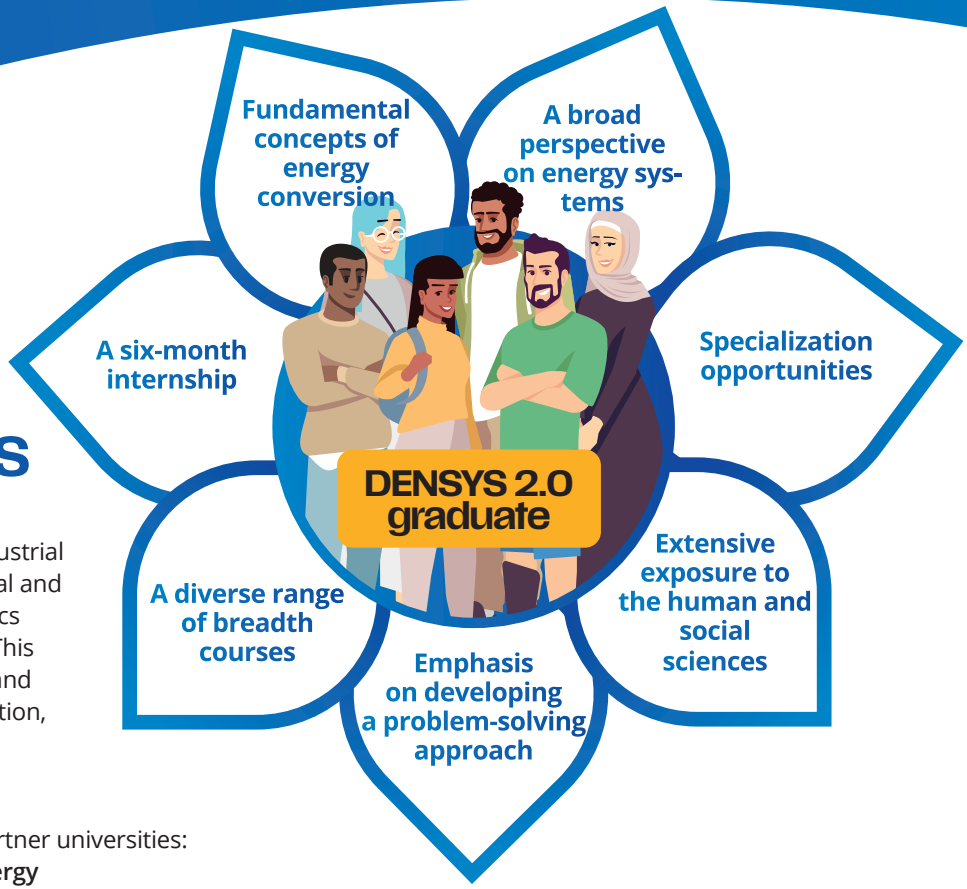
The Profile of DENSYS Graduates

DENSYS equips graduates to become high-level industrial leaders, analysts, and contributors to R&D (industrial and academic), through advanced training in multiphysics engineering (electrical, mechanical, and chemical). This comprehensive expertise enables them to understand and address various mechanisms of energy production, conversion, storage, integration into networks, and management.



DENSYS offers specialization opportunities at its partner universities:

- **Decentralized Energy Systems in a Global Energy Context – KTH, Stockholm**
- **Thermal Energy Engineering – UPC, Barcelona**
- **Energy-to-X: Innovative Pathways for Energy Storage – PoliTo, Turin**

Graduates benefit from a multidisciplinary curriculum, including courses in science and humanities, providing a systemic understanding of energy systems and the energy transition. This holistic approach prepares them to engage effectively with experts and stakeholders from various fields.

To enhance their problem-solving abilities and practical application of knowledge, **students undertake year-long challenges complemented by a master's thesis coupled with an internship (in industry or research institutions)**. This ensures they graduate with hands-on experience and the ability to address real-world challenges in the energy sector.

"They talk about it better than we do!"

Cohort 2021-2023

Sthefi Klaus
Siemens Industry Software

As a Simcenter Amesim Product Development Engineer, working at Siemens Industry Software, I develop hydrogen and battery-related models to support our system simulation solutions. My work contributes to advancing clean energy technologies by enabling engineers to simulate real-world performance, optimize designs, improve efficiencies, and accelerate innovation, helping industries transition toward a more sustainable future. And this journey was only possible thanks to DENSYS, which provided me not only with the technical expertise and system-level thinking essential for this role, but also with the resilience to tackle complex challenges, the proactivity to work independently, and the communication skills to collaborate effectively - all of which continue to shape my career every day.

Cohort 2020-2022

Nathaniel Eli Junior,
E.ON Inhouse Consulting GmbH

At E.ON Inhouse Consulting GmbH, I serve as a trusted advisor to E.ON's top leadership, creating the blueprint for Europe's energy transition and beyond. The DENSYS program was a transformative milestone - equipping me with both technical and essential soft skills, as well as a network that launched my career here. I am inspired by the opportunity to drive sustainable energy initiatives that impact millions of lives across Europe and contribute meaningfully to global climate action

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https://linktr.ee/densys

Collaborate with DENSYS:
be a part of shaping the future of energy transition

DENSYS invites industrial partners, NGOs, associations, and other stakeholders to join us in building a brighter, sustainable energy future. By collaborating with us, you can actively contribute to the development of the next generation of highly skilled engineers and researchers.

We would be delighted to have your support through:

- Contribute to the global energy transition by empowering future leaders in the field.
- Strengthen your organization's engagement with the academic and research communities.
- Gain access to a network of talented, highly skilled graduates who can drive innovation and progress in the energy sector.

Support DENSYS through donations

Your donations can make a significant difference in supporting the DENSYS program and enabling students to join and thrive.

- Even small contributions can have a big impact.
- Donations are processed through the ID+ Lorraine Foundation. Fiscal receipt can be delivred, espacially for French companies established in France, allowing to 60% tax reduction.

To contribute, please contact the DENSYS team via email:

densys-donations@univ-lorraine.fr

In-kind contributions

Promoting the program internationally

Disseminate DENSYS information (application campaigns, results, and events) through your organization's networks and media platforms.

Providing internship opportunities

Offer internships combined with master's thesis work (5 to 6 months) to help students gain practical experience and strengthen industry-academia collaboration.

Organizing site visits and immersive experiences

Host site visits to your factories, energy facilities, or laboratories.

Offer immersive days for students to explore the practical applications of energy systems within your organization.

Delivering professional lectures

Share your expertise through guest lectures, either onsite or online. Topics can include new technologies, emerging market segments, R&D initiatives, and more.

Contributing real-life challengeses

Provide real-world topics for our challenge-based education projects (year-long projects addressing issues rooted in energy systems).