

Institute of Energy and Electrical Systems

(IESE)

FROM STUDY TO THE CREATION OF NEW, INNOVATIVE SOLUTIONS

The IESE Institute provides skills in the energy electrical field in the broadest sense of the term, with special focus on energy systems with an electrical component. These skills are applied in the following five research areas:

1. Electrical energy production, transport, distribution, storage, and management
2. Electrical machinery and regulated drive systems
3. Power electronics and static conversion of energy
4. Electromechanical and mechatronic systems
5. Electromagnetic system and energy efficiency simulations

<http://iese.heig-vd.ch>



Scope

Applied Research and Development (AR&D) activities



Renewable energy and sustainable e-mobility

Mini-hydroelectric, Wind power, Photovoltaics, Fuel Cells.

Study and design of wind farm installations, performance appraisal of solar electric panels, studies on the penetration of new renewable energy systems, new solar technologies (solar trailer with lightweight photovoltaic panels), car parks for recharging electrical cars, solar marine craft, fuel-cell powered boats, practical testing of hydrogen fuel cells, hydrogen production studies, and the optimization of various battery types.



Power electronics and smart grids

Energy conversion and specific applications.

Design, modelling, and experimenting with new power electronics systems up to 100kV for industrial and medical applications, design and prototyping for aerospace applications and physics, innovative linear motors, and power applications.

ities directed at technology transfer to industry.

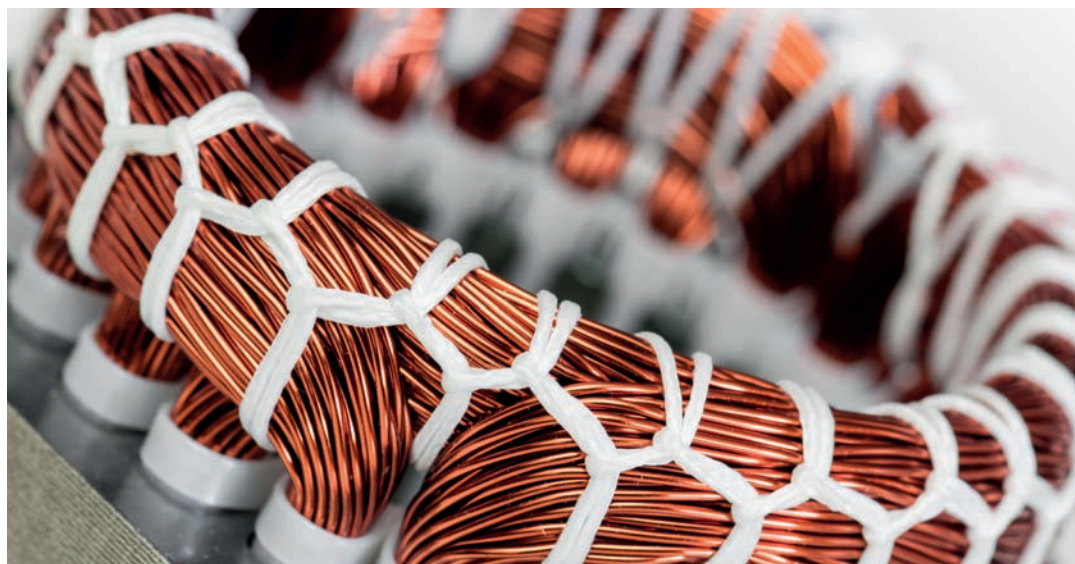


of small wind turbines and solar
gy (NRE) sources into electrical
voltaic panels), solar equipped
powered boats (FCB), design and
s and tests, testing and applica-

Urban energy systems in developing countries

Development of decision support tools for urban energy planning and for monitoring performance, structuring and sustaining energy data, development of interoperable urban energy networks, co-generation facilities; decentralized production and storage, power-to-X systems, industrial energy recovery in urban areas, development of low-carbon mobility solutions, participative approaches for rational energy consumption, Smart Cities.

Decentralized energy systems for developing countries, integration of farming and energy value chains, renewable energy market penetration strategies (biomass, solar, hydraulic).



systems; VHV power converters
production of special appliances
power converters for smart grid

Electrical machinery, mechatronics, electromagnetic simulations

Design, simulation, production, and trialling of new technologies in the field of electromagnetism. Development and testing of new electric motors and generators. Appraisal of innovative solutions.

Development of electromechanical drive systems and their controls in the scope of mechatronic applications.

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Types of service

The IESE Institute offers and provides the following:

- Direct services to SMBs and electrical firms: orders, assessments, consultancy, in-house training
- AR&D projects jointly financed by the European Union (EUresearch), European Space Agency (ESA), Swiss confederation (CTI, FNRS, OFEN, Swisselectric), the economic promotion of regions, the HES-SO school through its skill networks, electrical companies, associations, and private foundations
- Degree projects sponsored by SMBs and electrical companies and carried out by undergraduates (420h) or MSE postgraduates (900h)

The IESE is member of various bodies and organizations, some examples:

- RIE – Association for Energy Research and Innovation
- AES – Association of Swiss Electrical Businesses
- IEEE – Institute of Electrical and Electronics Engineers
- EPE – European Power Electronics
- Electrosuisse
- SCCER-FURIES – Swiss Competence Centers for Energy Research

Contact us

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Equipment and infrastructures

- Electrical machinery laboratory, featuring a self-sufficient electrical energy supply
- High voltage laboratory
- Power electronics laboratory
- Mechatronics laboratory
- Laboratory dedicated to energy efficiency in electrical appliances
- Laboratory dedicated to new renewable energy sources (photovoltaic, fuel cell, mini-hydroelectric, energy storage, hydrogen, test rigs, laboratory boat)
- Specific simulation tools, including Flux2D, Flux3D, MotorCad, PVsyst, Neplan, Plecs, EMTP-RV
- New: smart grid laboratory

Financing schemes

The AR&D Innovation and Technology Transfer centre at HEIG-VD facilitates access to Swiss and European funding, according to the requirements and nature of your collaboration with the IESE Institute, who will guide through the process.

HEIG-VD

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et Transfert de Technologie
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The 13 institutes and multidisciplinary R&D groups at HEIG-VD are genuine innovation drivers.

- Around 300 graduated professional researcher,
- About 200 R&D projects per year,
- An annual turnover of over 15 MCHF,
- More than 20 start-ups registered with the register of businesses.