

Lucerne University of  
Applied Sciences and Arts

**HOCHSCHULE  
LUZERN**

Engineering and Architecture  
FH Zentralschweiz

# COMPETENCE CENTER POWER ECONOMY

[hslu.ch/powerconomy](https://hslu.ch/powerconomy)





1'663

**STUDENTS IN  
BACHELOR'S DEGREE PROGRAMS**

173

**STUDENTS IN  
MASTER'S DEGREE PROGRAMS**

993

**STUDENTS IN  
CONTINUED EDUCATION**

449

**RESEARCHERS**

888

**ONGOING  
RESEARCH PROJECTS**

**LUCERNE SCHOOL OF ENGINEERING AND ARCHITECTURE**  
**WHERE PEOPLE AND IDEAS MEET!**



### Solutions for the power economy

To master the innovation dilemma means to strike a balance between operative efficiency and strategic development.

The Competence Center Power Economy combines distinct competences in three fields of action:

- electricity grids, energy and flexibility markets,
- business model and ecosystem innovation for energy technologies in the built environment,
- fostering energy efficiency through the assessment of multiple benefits.

Within each of these research areas, a dedicated team of experts addresses current topics relating to the energy industry. Our overarching goal is to support the energy transition by providing practical solutions for a sustainable energy future.

We support you with services, studies, funded research projects and accompanied student work. Find example projects at [hslu.ch/powereconomy](https://hslu.ch/powereconomy).



### Electricity grids, energy and flexibility markets

Advances in technological developments and the performance of operations analyses and optimisation support the market introduction of new products and solutions.



### **Business model innovation for energy technologies in the built environment**

New and flexible business models and ecosystems that are built around customer's needs and the peculiarities of new technologies and governance rules support the transition towards a higher share of renewable energy in buildings and districts.



### **Foster energy efficiency through the assessment of multiple benefits**

The realisation of an energy efficiency measure is beneficial for the environment. The extent to which also a business can profit from the implementation of an energy efficiency measure can be indicated by identifying, quantifying and monetising the associated multiple benefits.



## ELECTRICITY GRIDS, ENERGY AND FLEXIBILITY MARKETS

Flexibility is a key enabler for a successful future energy infrastructure, integrating a higher share of renewable electricity. Whether flexibility is provided by industrial processes or designated new technologies: we have the appropriate tools for a comprehensive economic assessment.

The Paris agreement, harmonization, individualization, urbanization and changing mobility patterns act as the driving forces for innovations regarding the energy infrastructure. At the same time, flexibility and expansion are considered the key enablers of success. We develop new business models and ecosystems, perform market, operational and technology analyses and assist the market introduction of new products and solutions in order to support our partners during the fundamental change of the energy market.

### **Core activities**

- Assessment of grid service markets in EU research projects
- Solutions for the electricity sector: supporting the identification of market opportunities
- Development of new business models and ecosystems: market and critical success factor analysis, value propositions and business logic development, governance model design
- Performance auditing, innovation management and strategy development: risk assessment, business case calculation, introduction of invention and realization processes and business model development

## ECOSYSTEM DESIGN FOR THE ENERGY TRANSITION OF THE BUILT ENVIRONMENT

Whether it is a decentralized multi-energy system in the urban environment or a platform for peer-to-peer electricity exchange: Building upon solid collaborations with public and private actors, we guide through the development of new businesses for energy efficient solutions in the built environment.

The way energy services are generated, delivered and traded is expected to change completely in the coming years. This requires new flexible business models built around customer's needs and the peculiarities of the new technologies such as decentralized multi-energy hubs or digital trading platforms. Companies will need to cooperate in new setups, building innovative ecosystems. We support the transition towards a higher share of renewable energy in buildings and districts through our expertise in technologies, customer needs, stakeholder management, and regulatory and financial boundaries.

### **Core activities**

- Business model innovation and ecosystem design for energy technologies in the built environment, particularly for multi-energy systems
- Modelling of energy flows and energy revenues and -costs considering different scenarios in decentralized energy systems
- Collaborative processes for the renovation of buildings and districts
- Valorisation of new possibilities in the energy sector such as the provision of demand side flexibility or data analytics
- Cooperation with national and international key researchers and companies







## FOSTERING ENERGY EFFICIENCY MEASURES THROUGH THE ASSESSMENT OF MULTIPLE BENEFITS

The valuation of Multiple Benefits of energy efficiency measures supports the decision-making process and leads to a sustainable increase of competitiveness. We develop methods and approaches, which are exclusively aligned to the specific requirements of our industrial partners in order to assess the profitability of energy efficiency investments based on a full-cost analysis.

Apart from the evident energy savings and CO<sub>2</sub> emission reductions, energy efficiency measures have additional positive effects on core business activities and strategic goals of a company: These effects are referred to as Multiple Benefits, such as for example the reduced need for maintenance, an improvement of process control or the increase of comfort. Our cross-sectoral approach to comprehensively identify, quantify and monetize Multiple Benefits enables businesses to emphasize the strategic character of an energy efficiency measure and simplifies the assessment of future investments.

### **Core activities**

- Responsibility for the implementation and validation of M-BENEFITS methodology into pilot projects in the Horizon 2020 project EE-15-2017
- Methodology development for the identification, quantification and monetization of Multiple Benefits
- Advancement of a standardized approach for full-cost analysis of energy efficiency measures, applicable to all industry sectors
- Research in cooperation with the Swiss Competence Centers for Energy Research – Efficiency of Industrial Processes (SCCER – EIP)

## Contact

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Power Economy  
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