At the heart of the key energy transition trends in Europe, we are committed to our clients, in delivering research-based innovative energy solutions for the sustainable growth of cities, local communities and industries.

OUR INSTITUTE

Created in September 2001, as European Economic Interest Grouping between EDF-Electricité de France and KIT-Karlsruhe Institute of Technology and located in Karlsruhe, EIFER-European Institute for Energy Research, is employing around 110 staff members of different nationalities, with multi-disciplinary skills. Together with international research entities, we aim at creating values for our two members and their respective partners: cities, local communities, and industries. We focus on three strategic priorities to tackle the challenge of the energy transition:

- Contribution to Sustainable City Engineering through integrated approaches, models and tools for the multi-sectorial analysis of cities and territories, for strategic planning
- Development of Local Energy Concepts and Solutions from technology road-maps and local resources analysis towards support to operational projects
- Analysis of the Trends and Interactions within Energy Systems through simulation at different scales and European prospective analysis using a systemic approach

OUR RESEARCH SERVICES

We offer a tailor-made portfolio of research activities to our clients.

**Upstream research**
- Materials and innovative component research
- Technology road-maps
- Regulatory watch

**Development of methodologies/tools**
- Modelling and simulation tools
- Energy planning methodologies, indicators setting
- Performance testing of components/systems

**Case studies**
- Concept design and system optimisation
- Policy analysis supporting decision-making
- Multi-criteria decision analysis

**Support for solution implementation**
- Scientific coordination of operational projects
- Objectives setting and experiment planning
- Data monitoring and results assessment
ENERGY, CITIES AND TERRITORIES

As the hubs of economic activity, cities drive the vast majority of the world’s energy use. Activities within cities are major contributors to global greenhouse gas (GHG) emissions. Nowadays, more than half of the world’s population is living in urban areas - and this share is projected to reach 60% by 2030. Cities and regional governments - both small and large - are well positioned to tackle the new energy related challenges. Furthermore local actors involved in spatial development of the built environment, transportation, natural resources management, buildings and energy planning are responsible for contributing to a transition towards low carbon cities.

EIFER works in the field of energy consumption behaviour and the impact of intervention measures to reduce energy consumption. In order to analyse the impact of different measures, tools and methods are developed in connection to Geographical Information Systems (GIS) for the spatial analysis of energy demand, production and CO₂ emissions.

ENERGY RESOURCES AND DISTRIBUTED GENERATION

The energy transition requires a new energy mix balance provided by centralized and distributed production systems. Those have to be based on efficient and flexible conversion technologies including energy storage systems or renewable energy. Our research focuses on their integration in the new energy markets and improves the value creation of existing and future energy assets.

Bioenergy, geothermal energy systems, cogeneration, fuel cells and electrolysis are the key stones of innovative concepts including power to heat and power to gas concepts. Strongly connected with scientific partners, our activities target cities, energy companies and industries for which we design new local energy solutions.

ECONOMICS OF ENERGY SYSTEMS AND ENVIRONMENT

Decision support for enhancing sustainable development

Sustainable development may be defined as development that seeks to improve the quality of human life, while living within the carrying capacity of the given eco-system. In this context, tools and analyses are needed to support decision-making that includes environmental constraints. EIFER provides this support with a focus on the energy sector. Research areas include:

- Quantifying impacts on and benefits from the environment
- Energy systems and energy policy analysis
- Climate change mitigation and adaptation