



Applied Engineering **in** Brussels

How the University Colleges of Brussels contribute to R&D



By InduTec



InduTec asbl - Technological Transfer Center

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INDUTEC, the Technology Transfer Centre for your Innovation (www.indutec.be)

InduTec is a dynamic Technology Transfer Centre whose mission is to enhance the exchange of technology and innovation between companies and industrial engineering faculties in the Brussels Region. By monitoring projects from concept to implementation, *InduTec* offers promotional opportunities and state-of-the-art experience to those faculties, and enables companies to reap the benefits of a quality science 'business incubator'.

A company's technological knowledge base is the foundation on which internal product and process innovations are generated. However, technological knowledge is not accumulated solely through internal learning processes. Increasingly, companies are turning to external sources in the technology supply chain to acquire the technological know-how they need to introduce product and process innovations. Thus, the successful structuring and executing of partnerships with external "technology source" organizations, such as the Technology Transfer Centre - *InduTec*, is often critical to competitive success in technologically dynamic environments.

The research activities of the industrial engineering faculties in the Brussels Region are future-oriented and innovative. The industrial engineering faculties collaborate with industrial and economic actors in Belgium and abroad through

- contract research (industrial research projects, technical feasibility studies, pre-competitive development, ...)
- economic valorisation (transferring R&D results through existing or new companies)
- protection of intellectual property, licencing agreements, spin-off guidance, ...

It all passes through *InduTec*, that knows how and where to find the appropriate competencies in the industrial engineering faculties to respond to the requests of industry.

If you are looking for new partnerships in managing your technological innovation, do not hesitate to contact our Technology Transfer Centre.

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■ Areas of Expertise

■ Agro-food technologies	52
■ Biotechnological Sciences	62
■ Electronics & ICT	72
■ Industrial Technologies & Material Technologies	81
■ Medicine & Human Health, Electromedical Equipment ...	88
■ Physical Sciences & Measurements	95
■ Protecting Man & Environment	100
■ Rational use of Energy	104
■ Transport Technologies	107





Areas of Expertise



The Rational Use of Energy

With energy use an increasingly important issue these days, the skills and expertise of the institutes in the energetic and thermal fields is focused on the development of technology resulting in the rational use of energy and on implementing renewable sources of energy (wind, solar and photovoltaic).

The emphasis is on resolving energy issues in the industrial, residential and tertiary sectors. The management tools and remote management of energy consumption developed by the institutes have produced a rational use of energy and a reduction in energy consumption within the industrial infrastructure.

Within this context, consultancy services are offered in the areas of:

- Design of energy installations
- Compliance of technical installations
- Resolving diverse problems related to energy loss in buildings

Research programs related to energy issues are also conducted in the automotive field: the impact of biofuels on engine performance; the study of new eco-concept cars (Shell Eco Marathon) and the study of energy savings in hybrid vehicle engines.



The following research units are involved in Rational Use of Energy activities:

Electrical & Automation Engineering Unit, HELDV - ECAM
Mechanical & Thermal Engineering Unit, HELDV - ECAM
Mechanical Conception Laboratory, HELDV - ECAM
Industrial and Environmental Chemistry Unit HEPHS - ISIB
Mechanical Engineering Unit, HEPHS - ISIB
Electromechanical Engineering Unit, EHB - IWT



RECENT RESEARCH PROJECTS

CELPHO - Cellules Photovoltaïques

Abstract: The design and production of an automatic sun-tracking rotating structure. This structure will enable comparisons of electrical energy collected by fixed panels and rotating panels.

Scientists: S. Lombart (ECAM).

Partners: Electrabel.

Technological Domain & Keywords: energetics, photovoltaic energy.

Biofuel development

Abstract: An evaluation of the outlook for biofuel supplies in Belgium; biofuel properties and a study of the mechanical performance of engines based on the relative contents of biofuels/fossil fuels in the feed.

Scientists: B. Bottin (ISIB), G. Georges (ISIB), L. Hocks (ISIB).

Partners: PSA Citroën.

Technological Domain and keywords: biofuels, biodiesel, bioethanol.

ECO Shell Marathon

Abstract: The Shell Eco Marathon is an educational project that integrates sustainable development values with the concept of driving as far as possible using the least amount of energy. This project comprises the study, design and machining of high-precision mechanical parts for the assembly of an energy efficient concept car.

Scientists: R. Itterbeek (ECAM).

Partners: Institut Von Karman.

Technological Domain and Keywords: mechanics, aerodynamics, CAD/CAM, rational use of energy, transport technologies.

PILOBATI - The remote and on-site management of energy consumption in buildings

Abstract: The remote and on-site management of energy consumption in buildings. Development of simulation and management tools for assessing the influence of a construction technique on the changing behaviour of a building in relation to its thermal dynamics.

Scientists: B. Arnould (ECAM).

Technological Domain & Keywords: energy management, energy efficiency in buildings, heating, ventilation.

Use of supercondensers with combined DC-converters in order to produce energy savings in drive systems

Abstract: In many cases, vehicle or machinery drive systems are designed according to dynamic load, which can result in the system's energy source (a generator or drive battery) being designed for maximum power. This implies overall high energy consumption when running under partial loads.

The current project involves the study of an additional component (supercondenser) to be added to the system to deal with peak loads. Supercondensers are electric condensers with a very high capacity (up to several thousand farads). The project aims to examine the practical opportunities of using such a component through theoretical simulations and practical tests. This analysis will enable the overall engine system requirements (drive structure, design of subcomponents and intelligent energy-management algorithms) to be determined for various applications. On this basis, corresponding investments will then be compared with energy savings.

Scientists: P. Van den Bossche (EhB).

Keywords: Transport Technologies, Hybrid and Electric Vehicles.



Areas of Expertise



The Rational Use of Energy

CONSULTING SERVICES & TRAINING

ENERGY EFFICIENCY IN BUILDINGS

- Analysis of the dynamic thermal behaviour of buildings; optimising centralised technical management
- Heat loss calculations from buildings according to EN ISO 12831 standard
- Design and upgrading of thermal and acoustic insulation in buildings
- Energy audit: energy accounting - the rational use of energy in buildings
- Infrared thermography of buildings: identification of heat bridges - preventative and curative measures
- Study of building compliance in relation to the European directive on energy performance in the field of HVAC

RATIONAL USE OF ENERGY

Design and upgrade of:

- Conventional cogeneration systems
- Cogeneration systems operating with biofuels

RENEWABLE SOURCES OF ENERGY

Design and upgrade of:

- Combined solar-energy and condensation systems
- Photovoltaic and thermic solar systems
- Wind turbines

SPECIALIST EQUIPMENT

- Photovoltaic solar power supplies (1kWp and 300 Wp)



