History & present day
The history of the Silesian University of Technology (SUT) goes back to 1844 when the Technical University of Lvov was founded. After WWII Lvov became a Ukrainian town while Gliwice was within the borders of Poland. The Silesian University of Technology was established in May 1945. At that time the core of the academic staff consisted of former professors of the Technical University of Lvov. Classes at SUT began in October 1945. At that time the University consisted of four faculties (Chemistry, Electrical Engineering, Civil Engineering and Mechanical Engineering), employing nearly 200 academic staff. Nowadays, the University is one of the biggest universities of technology in Poland. SUT is successfully pursuing its mission of education, research and development. For students, SUT provides opportunities for successful entry into professional life and career. For industry, the University offers a co-operation that gives good prospects of obtaining competent expertise, highly developed research works and projects facilitating economic growth.

Structure
The Silesian University of Technology is a self-governing state university managed by elected bodies, including: Rector, the supreme one-person body and Senate – a collective body of academics.

The Rector is assisted by four Vice-Rectors responsible for:
• education,
• research and cooperation with the industry,
• organization and development,
• international relations.

The everyday administration of the University is conducted by the Chancellor, an officer appointed by the Rector.

Education
SUT offers a full spectrum of engineering programmes in 63 engineering disciplines. The teaching scheme conforms with the Bologna Treaty recommendation. The 3.5 year undergraduate followed by 1.5 year graduate system equipped with ECTS credit system is implemented. National accreditation system secures the high quality of education offered at SUT. Bachelor courses are offered both full-time (3.5 years) and part-time (5 years). Ph.D. and continuing education courses are offered in the most attractive engineering disciplines.

Research
SUT is deeply involved in applied and theoretical research. The University enjoys multilateral co-operation with the industry and other research institutions. SUT faculty members participated in the Fifth as well as in Sixth Framework Programmes. Currently SUT is involved in Seventh Framework Programme and other European schemes (COST, RFCS, COPERNICUS, etc.).

Enrolment (2012 statistics):
- Undergraduate students: 22,900
- Graduate students: 6,100
- Total employment: 3,500
- Academic teachers: 1,875
- Professors: 343
History
The faculty in its present form was established in 1993 as a result of merging two units: the Faculty of Environmental Engineering and the Faculty of Mechanical and Power Engineering. The reason for the fusion was the need of implementing a new education strategy that would respond to the demand of the rapidly developing Polish economy, where professionals with good background both in energy engineering and environmental protection were urgently required. Another motivation behind the merger was the need to create strong, interdisciplinary research groups capable of developing efficient power generation and utilization processes and new measures in environmental protection.

Structure
The Faculty is headed by Dean whose responsibilities include the day-to-day business of the faculty and the implementation of the decisions made by the Faculty Council. The Dean is elected for a four-year term. The faculty consists of eight basic units:

- Department of Heating, Ventilation and Dust Removal Technology
- Department of Air Protection
- Department of Technologies and Installations for Waste Management
- Department of Environmental Biotechnology
- Institute of Water and Wastewater Engineering
- Institute of Power Engineering and Turbomachinery
- Institute of Thermal Technology
- Division for the Diagnostics and Testing of Combustion Engines

The teaching staff consists of 186 professionals with 25 full professors, 16 associate professors and 141 assistant professors (2012 statistics).

Education
The Faculty offers full time BSc and MSc courses as well as part time BSc courses in seven fields:

- Biotechnology
- Environmental Engineering
- Power Engineering
- Safety Engineering
- Mechanics and Machinery Design
- Environmental Protection
- Environmental and Power Engineering (in English)

Within these fields, students can select among 14 different specializations. Responding to the needs of the local industry, the Faculty organizes continuous education courses offered to postgraduates that wish to enhance their knowledge in several disciplines. The current offer encompasses seven courses ranging from waste disposal, occupational hygiene and safety to energy audit and market of electricity.

The Faculty also offers Ph.D. studies in the area of energy, mechanical and environmental engineering.

International student exchange programmes
The Faculty participates actively in international student exchange programmes. Over the years nearly 200 students have studied at European universities or completed their practical placement abroad. Most of these stays were supported within Erasmus Programme scheme.

Research
The faculty enjoys the highest rank in the classification of the Polish Ministry of Science and Higher Education. The Faculty Council is entitled to confer Ph.D. and D.Sc. (habilitation) degrees in environmental engineering and mechanical engineering. The Faculty staff co-operates with universities in more than 20 countries and participates in numerous international research programmes.
his studies in Lvov and graduated from SUT. He is one of the scientists who developed the exergy analysis. Prof. Szargut is a member of the Polish Academy of Sciences.

After Professor Szargut’s retirement in 1993, the head of the Institute was Professor Andrzej Ziębik. He served as a member of the State Committee of Scientific Research, chaired the Committee of Thermodynamics and Combustion of the Polish Academy of Sciences. Professor Ziębik resigned from his position in 2006 and his post was taken over by Professor Ryszard Białecki, until 2012 when he started to serve as Vice Rector for International Cooperation. Since 2012 Professor Andrzej Szeląg, former Deputy Director, is the head of the Institute.

The spectrum of the research carried out at ITT is wide. A multidisciplinary, holistic approach comprising classical engineering, economics, advanced applied mathematics and computer sciences as well as environmental engineering is used. The majority of projects have been supported by the Polish Government. An important share of the funds comes from the European Commission and industry.

ITT is affiliated with the Faculty of Energy and Environmental Engineering of the Silesian University of Technology. This defines the main directions of the activities being as follows:

Education | Research | Cooperation with the industry
Cooperation with the local community

Cooperation with the industry occurs on two platforms. The first one is consulting and projects financed by the industry and the other one continuous education courses offered by ITT to engineers. A similar mechanism is invoked to transfer the expertise of ITT staff in shaping the local energy and environmental policy to the nearby municipalities. Members of the staff serve also as advisers to the Polish government, Parliament and Senate.

The visibility of the ITT staff at both national and global levels is ensured by participation in editorial boards of five international scientific journals, four committees of the Polish Academy of Sciences and numerous Polish and international scientific and engineering organizations.

Members of the ITT staff have served as reviewers for over 80 international journals. They also participate in the process of reviewing Polish and international research projects, including the EU Framework Programme ones.
Board of Directors

Director: Professor Andrzej Szlęk
V-ce Director for Research: Professor Ireneusz Szczygieł
V-ce Director for Education: Professor Andrzej J. Nowak

The Institute employs 68 individuals:
12 full professors
3 associate professors
26 assistant professors
36 masters of science (assistants and PhD students)
8 administrative and technical staff

The staff is divided into smaller functional research groups called divisions

Thermodynamics, Energy Management and Refrigeration
Combustion, Internal Combustion Engines and Renewables
Heat Transfer and Nuclear Power Engineering

The total usable floor used by the Institute amounts to nearly 10 thousand square meters. Nearly the half of it is located in the building at 22 Konarskiego Street.

Address and contact information

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44-100 Gliwice, Poland

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fax: +48 32 237 28 72
email: rie6@polsl.pl
www.itc.polsl.pl

ASSOCIATE AND FULL PROFESSORS

Professor Ryszard A. BIAŁECKI
tel.: +48 32 237 29 53 | e-mail: ryszard.bialecki@polsl.pl
www.itc.polsl.pl/bialecki
Fields of interest: numerical methods in heat transfer, solid and fluid mechanics, heat radiation, CFD, inverse problems, shape optimisation, artificial intelligence

Professor Joachim KOZIOL
tel.: +48 32 237 16 72 | e-mail: joachim.koziol@polsl.pl
www.itc.polsl.pl/koziol
Fields of interest: power and environmental engineering, refrigeration, industrial energy systems, energy and economic analysis of industrial processes

Professor Andrzej J. NOWAK
tel.: +48 32 237 10 25 | e-mail: andrzej.j.nowak@polsl.pl
www.itc.polsl.pl/nowak
Fields of interest: heat transfer, thermodynamics, numerical techniques in thermal engineering, mathematical modelling of heat transfer processes, CFD

Professor Stefan POSTRZEDNIK
tel.: +48 32 237 12 31 | e-mail: stefan.postrzednik@polsl.pl
www.itc.polsl.pl/postrzednik
Fields of interest: thermodynamics, internal combustion engines, charge exchange processes in combustion engines, pollutants emission

Professor Zbigniew RUDNICKI (part time)
tel.: +48 32 237 10 17 | e-mail: zbigniew.rudnicki@polsl.pl
www.itc.polsl.pl/rudnicki
Fields of interest: fundamentals of radiative heat transfer, absorption and emission of technical gases, mathematical modelling of radiative heat transfer, industrial furnaces, thermodynamics

Professor Henryk RUSINOWSKI
tel.: +48 32 237 24 49 | e-mail: henryk.rusinowski@polsl.pl
www.itc.polsl.pl/rusinowski
Fields of interest: energy management, empirical modelling of the complex thermal and energo-technological processes, advanced validation of the measurements, thermal diagnosis and control systems for power plants

Professor Jan SKŁADZIEŃ
tel.: +48 32 237 29 52 | e-mail: jan.skladzien@polsl.pl
www.itc.polsl.pl/skladzien
Fields of interest: heat transfer, thermodynamics, refrigeration, nuclear engineering

Professor Janusz SKOREK
tel.: +48 32 237 24 27 | e-mail: janusz.skorek@polsl.pl
www.itc.polsl.pl/skorek
Fields of interest: heat transfer, thermodynamics, industrial energy systems, cogeneration, power plants
Head: Prof. Joachim Koziół

Research fields

- Mathematical modelling of energy management of industrial plants
- Analysis of the cumulative consumption of energy and exergy
- Optimisation of thermal processes
- Application of the least square adjustment technique in thermal engineering
- Heat and power cogeneration management. Gas, coal and combined gas and steam cogeneration plants
- Theory and practice of waste energy recovery
- Improvement of heat management of industrial plant
- Thermodynamic and economic problems of environmental protection
- First Law and economic analysis of refrigeration systems
- Optimisation of design parameters of refrigeration equipment
- Industrial air conditioning
- Optimisation of cooling processes
- Cooling of industrial water
**DIVISION OF COMBUSTION, INTERNAL COMBUSTION ENGINES AND RENEWABLES**

Head: Prof. Ryszard Wilk

**Research fields**

- Mathematical modelling of combustion processes utilizing commercial packages and in-house codes
- Low-emission combustion technologies
- Biomass combustion and gasification
- Technology of combustion in highly preheated air – HTAC
- Boilers and burners fuelled with solid, liquid and gaseous fuels
- Experimental investigation of combustion and gasification processes
- Thermal processes occurring in internal combustion engines
- Catalytic converters
- Measurement of fuel properties
- Radiative properties of gases.
- Combustion of low calorific value gases in internal combustion engines
- Car operation and traffic safety
- Advanced and unconventional car drives
- Technical and economic analysis of renewable energy sources

**DIVISION OF HEAT TRANSFER AND NUCLEAR POWER ENGINEERING**

Head: Prof. Ireneusz Szczygieł

**Research fields**

- Modelling of heat and mass transfer problems utilizing in-house codes and commercial packages
- Application and development of inverse methods in heat and mass transfer problems
- Modelling of biomed-engineering problems (heat transfer in humans, human thermal physiology, environmental ergonomics, thermal comfort)
- Mathematical modelling of ground water flow and pollutant propagation
- CFD aided thermo-ecological optimisation and LCA analysis of thermal devices
- Experimental and numerical analysis of multiphase flows of fluids and solids
- Problems of nuclear engineering and protection against nuclear radiation
- Thermal and numerical analysis of a vapour heat pump interacting with a ground heat exchanger
- Experimental and computational analysis of cross-flow heat exchangers with non-uniform fluid flows
- Empirical and numerical analysis of heat transport in semiconductors and electronic equipment
Teaching at the Institute of Thermal Technology comprises lectures, recitations, demonstrations, projects, laboratories and seminars in five fields of studies offered by the Faculty of Energy and Environmental Engineering:

- Environmental Engineering
- Mechanical Engineering
- Energy Engineering
- Environmental Protection
- Safety Engineering

Students of Environmental Engineering, Mechanical Engineering and Energy Engineering are offered both BSc and MSc courses while students of Environmental Protection are offered only BSc courses.

The Institute of Thermal Technology offers classes in English for all fields of studies. For BSc students this major has the name Energy and Environmental, while for MSc students the name of the major is Computer Aided Energy Engineering.

The ITT academic staff is involved in full-time and part-time courses in two campuses: in Gliwice and in Rybnik (Engineering Education Centre). Teaching at ITT is divided into the following categories, according to the educational standards:

- fundamental engineering knowledge classes
- classes resulting from the field of studies
- specialisations

Currently our Institute offers the following majors in Polish:

**Field of study: Environmental Engineering**
- Environmental engineering and clean technologies in energy engineering and motorization
- Municipal energy management

**Field of study: Mechanical Engineering**
- Automotive engineering
- Refrigeration engineering and air-conditioning
- Nuclear reactors engineering

**Field of study: Energy Engineering**
- Energy processes and systems
- Nuclear engineering
- Gas energy engineering and distributing energy generation
- Heat diagnostics in energy engineering

**Field of study: Environmental Protection**
- Environmental Protection in Energy Engineering

The Institute provides a significant number of laboratories for the students of all four fields of studies. Their aim is to supplement the lectures and recitations. Further details are available in the programmes offered by respective lecturers.

ITT is also involved in student industrial trainings, both vacation and individual ones, which are important for the specialisation of the student.
Experimental research is one of the most important activities of the Institute. ITT maintains several laboratories used for both education and research purposes:

**Computer Laboratory and Network in ITT**  
Head: Dr Andrzej Sachajdak

**Laboratory of Combustion Fundamentals**  
Head: Dr Andrzej Ksiądz

**Laboratory of Fuels Combustion and Gasification**  
Head: Prof. Andrzej Szlęk

**Laboratory of High Temperature Processes**  
Head: Prof. Marcin Szega

**Laboratory of Internal Combustion Engines and Gas Turbines**  
Head: Dr hab. Zbigniew Żmudka, Dr Grzegorz Przybyła

**Laboratory of Nuclear Engineering**  
Head: Dr Tomasz Bury

**Laboratory of PIV**  
Head: Dr Zbigniew Buliński

**Laboratory of Refrigeration**  
Head: Dr Wiesław Gazda

**Laboratory of Thermal Technology**  
Head: Dr Tadeusz Kruczek

**Computer Cluster**  
Head: Dr Zbigniew Buliński, Paweł Kozołub, MSc, Wojciech Adamczyk, MSc

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**Research offer**  
The versatility of the research spectrum at the Institute of Thermal Technology is generated by several factors: experienced academic staff, high quality, state-of-the art measuring equipment and advanced modelling tools. The Institute of Thermal Technology offers collaboration in all areas of its staff expertise.

**Commercial offer**  
The Institute, in its present form, has been functioning for thirty years, actively co-operating with Polish industry. The experience and results of research work provide a scope for co-operation. The institute offers many technological solutions, products and services that can be applied within industrial plants. Here are some examples:

- Modelling, simulation and computer aided design of energy plants and technologies
- CFD simulation and optimisation of thermal-fluid phenomena
- Software for sizing and optimisation of small-scale cogeneration plants
- Software for control of energy plants operation
- Software for computer aided energy management systems
- Computer package for calculation of thermal and calorific parameters of real gases and their solutions, steam and freon.
- Computer systems for control of power and heat units operation
- Conceptual design projects of thermal processes and energy plants
- Energy audits
- Design and off-design analyses of technological structures of energy plants
- Assessment and optimisation of heating systems (pipelines and utilities)
- Analysis and design of heat exchanger networks
- Technological and combustion control solutions for NOx and CO emission reduction during combustion of solid and liquid fuels
- Design projects of burners and combustion chambers
- Thermovision (IR) measurements
- Wide range of mathematical modelling and energy balances energy plants and technological processes
- Determination of thermo-physical properties of solid bodies
- Pre-feasibility and feasibility studies of energy projects
Projects financed by the European Union and other European institutions

- REsearch Center for Energy and New Technologies RECENT, FP7 of EU, Theme 4, Capacities, 2010–2013, www.itc.polsl.pl/recent; Coordinator: Prof. Ryszard Białecki
- Preparatory Study for Eco-design Requirements of EuPs – Lot 15: Solid Fuel Small Combustion Installations (Elaboration of low emission technology of solid fuel combustion – coal and biomass in low capacity boilers and strategy of their implementation), contract with The Directorate-General for Energy and Transport in the European Commission realized by BIO Intelligence Service (project leader), Institute of Thermal Technology, Silesian University of Technology, Poland and AEA Technology, U.K., 2007–2009, Coordinator: Dr Krystyna Kubica
- Innovative Silesian Cluster of Clean Coal Technologies, Structural Funds of EU, www.coal.silesia.pl
  Coordinator of Research Partners: Prof. Andrzej Ziębik
- Development, characterization and scaling of atomizers for a combustion technology that offers significant fuel savings and drastic reduction in both CO2 and NOx, FP5 of EU, 2000–2002, Coordinator: Prof. Ryszard Wilk

Development projects financed by Polish Ministry of Science and Higher Education

- Tools for computer aided design of flotation machines, 2010–2013
  Coordinator: Prof. Ireneusz Szczygiele
- Design and implementation of a dispatching platform for the purpose of parametric monitoring the infrastructure of a natural gas distribution network, 2009–2012
  Coordinator: Prof. Janusz Skorek
- Elaboration of dedicated computer application for creation of high-efficiency cogeneration strategy with economic and environmental criteria including CO2 emission, 2009–2012
  Coordinator: Prof. Andrzej Ziębik
- Development of low-emission technologies of coal and biomass combustion in small capacity boilers and strategy of their implementation
  Coordinator: Dr Krystyna Kubica
- Development of the technology of biomass gasification and syngas co-combustion with coal
  Coordinator: Prof. Ryszard Wilk
- Development and implementation of the method for the selection of the best technologies of the chemical energy of fuels conversion into thermal energy and electricity on the basis of artificial intelligence tools
  Coordinator: Prof. Andrzej J. Nowak
Strategy projects financed by National Centre for Research and Development

- Integrated System for Reducing Energy Consumption in the Maintenance of Buildings. Activity No 3: Increase of energy utilization from renewable energy sources (RES) in building engineering. **Leadership and ITT Coordinator:** Prof. Joachim Koziół
- Advanced Technologies for Energy Generation, Activity No 1 „High-efficiency and zero-emission technologies for coal fired power plant with CO2 sequestration”. **Leadership:** Faculty of Energy and Environmental Engineering, Silesian University of Technology (Gliwice), **ITT coordinator:** Prof. Andrzej Ziębik
- Advanced Technologies for Energy Generation, Activity No 2 „Oxy-combustion technologies for pulverized fuel and fluidized bed boilers integrated with CO2 sequestration”. **Leadership:** Faculty of Environmental Protection and Engineering, Czestochowa University of Technology (Częstochowa), **ITT coordinators:** Prof. Ryszard Baiałęcki & Prof. Andrzej Ziębik
- Advanced Technologies for Energy Generation, Activity No 3 „Coal gasification technologies for high-efficiency fuels and electrical energy production”. **Leadership:** Faculty of Energy and Fuels, Faculty of Mining and Geoengineering, Faculty of Management, AGH University of Science and Technology (Kraków), **ITT coordinator:** Prof. Andrzej Ziębik
- Advanced Technologies for Energy Generation, Activity No 4 „Integrated fuel and energy production technologies from biomass, agricultural and other wastes”. **Leadership:** Institute of Fluid-Flow Machinery PAS (Gdańsk), **ITT coordinator:** Prof. Andrzej SZełk

Research projects financed by Polish Ministry of Science and Higher Education

2012
- Experimental and numerical analysis of combustible properties of sewage sludge gasification gas. **Coordinator:** Dr Sebastian Werle
- Optimisation of laboratory and industrial thermostatic cabinets and drying ovens with natural circulation using experimentally validated CFD numerical analysis. **Coordinator:** Dr Jacek Smołka
- Sewage sludge gasification in fixed bed gasifier in highly preheated air (HTAG technology). **Coordinator:** Dr Sebastian Werle

2011
- Study on the reduction of the nitrogen oxides emission using thermal utilization of sewage sludges. **Coordinator:** Prof. Ryszard Wilk
- Developing of thermoeconomical optimization methods of thermal processes. **Coordinator:** Prof. Ireneusz Szczygiel
- Pyrolysis of mixtures of biomasses. **Coordinator:** Prof. Andrzej SZełk
- The analysis of neonatal brain cooling process. **Coordinator:** Prof. Andrzej J. Nowak

2010
- Optimisation of laboratory and industrial thermostatic cabinets and drying ovens with natural circulation using experimentally validated CFD numerical analysis, **Coordinator:** Dr Jacek Smołka
- Optimisation of energy and media management in municipal educational buildings, **Coordinator:** Prof. Joachim Koziół
- Model of the radiative properties of optically active gases. **Coordinator:** Dr Gabriel Węcel
- Thermodynamic and numerical analysis of system consisting of cooled/heated object - compression vapor heat pump - ground heat exchanger. **Coordinator:** Dr Małgorzata Hanuszkiewicz-Drapała

2009
- Analysis and optimisation of distributed cogeneration plants integrated with biomass gasification. **Coordinator:** Dr. Jacek Kalina
- Experimental and computational analyses of heat and fluid flow processes in a finned cross-flow heat exchanger with a uniform flow of working fluids. **Coordinator:** Prof. Jan Składzień
- Shape optimisation of selected elements of electrical transformer and its tank leading to power loss reduction using experimentally validated CFD numerical analysis, **Coordinator:** Dr Jacek Smołka

Projects financed by industrial partners

73 projects were executed in years 2006–2012.
Within the last 25 years more than 100 books, more than 1000 journal papers and a large number of national and international conference papers have been published by the ITT staff. This makes the Institute one of the most known research institutions in Poland.

**Selected books published in years 2006–2012:**

**ITT staff publish papers in a wide range of Polish and international journals. The publications can be found in:**
- *Applied Energy*
- *Applied Thermal Engineering*
- *Archives of Computational Methods In Engineering*
- *Archives of Thermodynamics*
- *Archivum Combustions*
- *Atomization and Sprays*
- *Chemical and process Engineering*
- *Combustion and Flame*
- *Combustion Engines*
- *Combustion Science and Technology*
- *Computational Mechanics*
- *Computers and Fluids*
- *Computer Assisted Mechanics and Engineering Sciences*
- *Computer Methods in Applied Mechanics and Engineering*
- *Electronic Journal of Boundary Elements*
- *Energy – the International Journal*
- *Energy and Buildings*
- *Energy Conservation and Management*
- *Engineering Analysis with Boundary Elements*
- *Gesellschaft Energietechnik*
- *Heat Transfer Engineering*
- *International Journal of Heat and Mass Transfer*
- *International Journal for Numerical Methods in Engineering*
- *International Journal of Applied Thermodynamics*
- *International Journal of Energy*
- *International Journal of Energy Research*
- *International Journal of Thermal Sciences*
- *Inverse Problems in Engineering*
- *Inverse Problems in Science and Engineering*
- *Journal for Numerical Methods in Engineering*
- *Journal of Energy Resources Technology*
- *Journal of KONES Powertrain Transport*
- *Journal of the Energy Institute*
- *Medical Engineering & Physics*
- *Numerical Heat Transfer*
- *Systems – Journal of Transdisciplinary Systems Science*
- *VDI-Berichte*, and many other journals
The Institute frequently organizes conferences and seminars on issues related to thermal engineering, heat transfer, energy management, combustion, mathematical modelling and numerical methods. These events are both for national and international participants (scientists, engineers and Ph.D. students who are actively involved in thermal engineering). The number of such events organized by the Institute within the last 15 years exceeds 30. The main idea of organizing such meetings is to create a meeting platform for specialists and to provide a forum for presentation and discussion of up-to-date information and achievements of thermal and energy engineering and management.

Examples of international events organized by the Institute:

- **8th International Conference on Inverse Problems 2014**
  May 2014, Kraków, Poland |
  www.icipe2014.org

- **International Conference on Contemporary Problems of Thermal Engineering 2012**
  September 2012, Gliwice, Poland |
  www.itc.polsl.pl/CPOTE2012

- **Numerical Heat Transfer 2012**
  September 2012, Wrocław, Poland |
  www.itc.polsl.pl/nht

- **Workshop on Advanced system analysis with special stress on LCA and financial analysis**
  October 2011, Gliwice, Poland

- **International Conference on Carbon Reduction Technologies CaRe_Tech 2011**
  September 2011, Polish Jurassic Highland, Poland |
  www.itc.polsl.pl/CaRe_Tech

- **Seminar Biomass, oxycombustion, CSS – dangers and gains**
  June 2011, Gliwice, Poland |
  www.itc.polsl.pl/co2sem

- **Workshop on Advanced Techniques in CFD**
  June 2011, Gliwice, Poland |
  www.itc.polsl.pl/cfd2011

- **Seminar Clean Industrial Fuel Utilization**
  March-April 2011, Gliwice, Poland |
  www.itc.polsl.pl/cifu

- **Seminar How can the system analysis assist the energy sector?**
  November 2010, Gliwice, Poland |
  www.itc.polsl.pl/assen

- **IV International Scientific and Technical Conference Energy from Gas 2009**
  September 2009, Warsaw, Poland

  June 2008, Kraków, Poland |
  www.ecos2008.polsl.pl

- **Clean Coal Technologies**
  September 2007, Pszczyna, Poland |
  www.itc.polsl.pl/aszlek/czystywegiel

**INTERNATIONAL CO-OPERATION**

The Institute co-operates with several international institutions. These are mainly universities, research centres and industrial partners. International co-operation represents an important dimension of the ITT activity. Having followed the trends established by the European Commission, the Institute develops and strengthens links with international partners. ITT has fully adopted the idea of an integrated European Research Area. ITT took part in the following international projects and programmes: 5th, 6th, 7th Framework Programme (European Commission), Norway Grants (Norwegian Financial Mechanism), COST, INCREASE (Polish-German cooperation), TEMPUS, ERASMUS, COPERNICUS, Research Found for Coal and Steel.

**ITT in Framework Programmes**

The presence of the Institute in EU founded Framework Programmes was started in the year 2003 when within the frame of EU Fifth Framework Programme the Institute gained the status of the Centre of Excellence – the OPTI_Energy project. ITT was the leader of the international consortium that consisted of more than 20 European universities. The purposes of creating the Centre were intensification of the networking with European partners, capacity building through attracting young researchers by organizing international Ph.D. studies, extension of the scope of research activities of the Centre, enhancement of the cooperation with the industry and co-operation with the local governments in Poland. The project was coordinated by Prof. Ryszard Bialecki and ended in 2005.

**www.itc.polsl.pl/inspire**

Then, starting from the year 2006, the Institute was a member of the INSPIRE project consortium. The project aimed at optimization of Systems, energy management, and environmental impact in Process Engineering. INSPIRE is a Marie Curie Research Training Network (RTN) supported by the EU’s Sixth Framework Programme. The project coordinated by Prof. Roman Weber of the Clausthal University of Technology (Germany) ended in 2009.

**www.itc.polsl.pl/recent**

Since the year 2010 the Institute has been coordinating the RECENT project – REsearch Center for Energy and New Technologies. The project objectives are to enhance the research capacity of the Institute, implement new management techniques, reinforce the links with the industry, strengthen the links with strategic partners by exchanging experience, two-way staff exchange and joint organization of workshops and conferences. The project is coordinated by Prof. Ryszard Bialecki and planned to end in 2013.

**ITT in Norway Grants**

**www.itc.polsl.pl/co2heatpumps**

In 2008 the Institute together with SINTEF (Norway) started a research grant on Development of High-Efficiency, Small-Scale Heat Pumping Units Using an Environmentally Benign Working Fluid R744 and Expansion Work Recovery with Ejectors, financed by the Polish-Norwegian Research Fund. The project was managed by Prof. Andrzej J. Nowak and ended in 2011.
Annual budget and sources of the funds

The financial means to run the Institute come from different sources:

- The Ministry of Research and Higher Education – funds for education. This portion depends on the number of students and qualifications of the staff. The high number of professors at ITT results in relatively high financial support coming from this source.

- Ministry of Research and Higher Education – funds for fundamental research. Financing depends on the number of published works and their quality, number of patents and similar measures of the excellence in research. As the Institute has the highest rank in the classification of the Ministry, the funds are relatively high.

- Ministry of Research and Higher Education – individual grants. This way is very competitive as the average rate of success at The National Committee calls for proposals is about 3/10. The same rate at the Institute reaches 8/10.

- European Community and other International Research Funds

- Projects financed directly by the industry. This is a way of supporting applied research and consulting. This portion of the budget has been variable over years and it has strongly depended on the strength of the national economy.

- The other source of income (not indicated in the figure below) are donations being made by industrial partners. The good relationships result from the links with the alumni of the centre and current research activities. Funds raised from this source in subsequent years differ significantly.

Some figures from ITT statistics

### ITT Staff Structure

<table>
<thead>
<tr>
<th>Year</th>
<th>Professors</th>
<th>Assistant Professors</th>
<th>Assistants &amp; Ph.D. students</th>
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Number of Projects, PhD. & D.Sc. Theses, Industrial Projects
In the year 1922 the City Female Lyceum was attached to the Higher Lyceum. The new school was named after Joseph von Eichendorff, a famous German romantic poet born in Upper Silesia. Eichendorff-Schule, Städtisches Lyzeum und Oberlyzeum move to the new building on April 24th, 1930. After the Second World War the building is used as the Russian soldiers’ hospital. The consecutive user is the Silesian Technical University founded on 24th May 1945. The building starts to be used by the Mechanical Engineering Faculty, nowadays the Faculty of Energy and Environmental Engineering, formed in 1993 by merging the Mechanical and Environmental Engineering Faculties.

The modern building was erected for a sum of 1.5 million marks. The project was designed at the direction of the city building adviser Karl Schabik in cooperation with the building master Henneck. The exceptional view of the building resembles a transatlantic ship anchored ashore, parallel to the no longer existing Gliwice Channel. The mass figure consists of two cuboidal wings creating an open angle. Both are covered with four inclining roofs with rectangular lucarnes. The whole is covered with red roof tiles. The front wing – a higher one – is formed by two characteristic corner stairway blocks at the opposite sides. The main entrance is decorated with four stone figures – the personification of the basic female education domains: music, literature, gardening and sport, by Prof. Hans Damman. On the ground floor – a gym hall, on the last floor – a spacious aula were located, both with expressive cast-concrete lifting columns. The remaining floors have two traces of study rooms with a corridor between. The second wing – a lower one – is equipped with one staircase with the five-side shape. On each floor there are corridors with characteristic triangular or broken lifting columns and one row of study rooms. 23 rooms have a capacity for 700 students. In the cellars there are a bathroom, service flat, scientific aid storage rooms and machinery rooms. Three staircases are covered with a flat terrace roof and a flag mast. The planks connecting the outer windows give the effect of transoceanic line ships. The building connects two characteristic opposite aesthetics of the Weimar Republic – expressionism and functionalism (Neues Bauen), i.e. the romantic-national idea with modern rationalistic enlightenment. The usage of the most modern solutions and technological materials leads to Corbusierre’s idea of the machine – the modern model of comfortable and hygienic education. The dynamic modern looks as well as the space solutions give us a chance to admire the quality and the level of making. In spite of using the building against its initial purpose, it has remained unchanged and in a good technical condition. The continuous education, although at different levels and faculties, obligates the esteem of tradition of the former Eichendorff Lyzeum. Today it connects three cultures: the pre-war Lvov, modern contemporary Silesia and the German architecture art of the Weimar Republic.
ITT is located near the centre of Gliwice, the address is Konarskiego Street 22 (50°17’39’’N, 18°40’47’’E / 50.29421°N, 18.679867°E), approx. 1.5 km from the Central Railway Station (15 min. walk, 7 min. by car), a taxi rank and PKS Bus Station. Gliwice has efficient transport facilities which provide convenient local and international connections. The nearest airports are Katowice-Pyrzowice (KTW, 40 km), Kraków-Balice (KRK, 100 km), Wrocław (WRO, 170 km) and Ostrava (Czech Republic, OSR, 95 km).

Access from Katowice Airport (KTW)

Airport home page: www.katowice-airport.com
The airport has a direct flight service with London, Paris, Rome, Frankfurt/M, Munich, Dusseldorf, Glasgow, Liverpool, Oslo, Stockholm, Warsaw, and others operated mainly by LOT Polish Airlines, Lufthansa, Wizz Air and Ryan Air (see the airport home page for details and timetables).

BY CAR Car hire is available at the airport (see the airport home page). The route: Pyrzowice – Gliwice: motorway A4 to Gliwice; distance – 40 km, time – approx. 30 minutes. There is also a taxi service at the airport.

PUBLIC TRANSPORT Daily Airport Bus service: Katowice – Katowice-Pyrzowice (airport) – Katowice (in Katowice the bus stops at the Katowice Novotel Hotel and the railway station), time: approx. 40 minutes, ticket – 26 PLN, (www.pkm.katowice.pl/pyrzowice.php). Public Bus Service: Line 53 – Bytom Central Railway Station – Pyrzowice Airport (time – approx. 60 minutes) Line 85 – Bytom Central Railway Station – Pyrzowice Airport (time – approx. 60 minutes). Timetable is available on www.kzkgop.com.pl. Railway connection is available from Katowice to Gliwice (details at Polish Rail home page www.pkp.pl), from Bytom (Central Railway Station) there is a taxi service or public bus service (no. 850, time – approx. 50 minutes). Details concerning possibilities of the transportation to and from the airport can be found on the airport home page.

Access from Kraków Airport (KRK)

Airport home page: www.krakowairport.pl
The airport has a direct flight service with e.g. Frankfurt/M, Paris, Rome, Leeds, Brussels, Amsterdam, Vienna, Rome, Turin, Athens, Prague, Stockholm, Oslo, Madrid, New York, Chicago and Warsaw, operated by PLL LOT, Lufthansa, Swiss, British Airways, Ryanair, Norwegian (see the airport home page for details and timetables).

BY CAR Car hire is available at the airport, e.g. Budget, Europcar, Hertz, or Avis. The route Balice – Gliwice: motorway A4 (toll: 18 PLN = approx. 4.5 euro /prices 2013/), direction Katowice; distance – 100 km, time – approx. 70 minutes. There is also a taxi service at the airport.

PUBLIC TRANSPORT Public bus service from Kraków-Balice airport to the centre of Kraków: lines 208, 292 and 902, time: approx. 30 minutes. Bus timetables are available on www.mpk.krakow.pl (in Polish only). It is also possible to use a local fast train system to the city centre – time: approx. 18 minutes, ticket 12 PLN. There is a train service: Kraków – Gliwice (Polish Rail home page – www.pkp.pl).

Access from Wrocław Airport (WRO)

Airport home page: www.airport.wroclaw.pl
The airport offers direct flight service to Frankfurt/M, London, Liverpool, Munich, Dortmund, Rome, Milan, Copenhagen and Warsaw (see the airport home page for details and timetables).

BY CAR Car hire is available at the airport, e.g. Budget, Europcar, Hertz or Avis. Car route Wrocław – Gliwice: motorway A4 to Gliwice; (toll: 16.4 PLN = approx. 4 euro /prices 2013/), distance – 170 km.

PUBLIC TRANSPORT Public bus service from Wrocław Airport to the Central Railway/Coach Station – line 406 (operates every 20 minutes every day, time – approx. 30 minutes), night bus line 249 operates on the line Airport – Jaroměřice, twice during night or by taxi. There is a train connection Wrocław – Gliwice. The journey takes about 2.5 hours (details – www.pkp.pl).

Access from Ostrava Airport (OSR)

Airport home page: www.airport-ostrava.cz
The airport offers direct flights to e.g. Prague, Vienna, Moscow – details and timetables can be found on the airport home page.

BY CAR Car hire is available at the airport, e.g. Europcar, Hertz. Car route Ostrava – Gliwice: road no. 58 to the border crossing in Chałupki, after the border – road no. 78 (direction Gliwice); distance – 95 km, time – approx. 2 hours.

PUBLIC TRANSPORT Information on how to get from the airport to the centre of Ostrava (public transport, taxi service) is available on the airport home page. There is a train service Ostrava – Gliwice, changing at Katowice (details on Polish Rail home page – www.pkp.pl).

Access from Warsaw Airport (WAW)

Airport home page: www.porty-lotnicze.com.pl
The airport offers direct flight service to e.g. Prague, Vienna, Moscow – details and timetables can be found on the airport home page.

BY CAR Car hire is available at the airport, e.g. Budget, Europcar, Hertz, or Avis. Car route Warsaw – Gliwice: road no. 8 to Piotrków Trybunalski, road no. 1 south, road no. 51 (towards Katowice Airport) and motorway A4 to Gliwice; distance – 310 km, time – approx. 4 hours.

PUBLIC TRANSPORT There is a train connection from Warsaw to Gliwice. Information about the transfer to and from the airport is available on the airport home page. (Polish Rail home page – www.pkp.pl)

Car routes from major Polish cities

Katowice – motorway A4 to Gliwice; 30 km
Kraków – motorway A4 to Gliwice; 105 km
Warszawa – road no. 8 to Piotrków Trybunalski, road no. 1 south, road no. 51 (towards Katowice Airport) and motorway A4 to Gliwice; 310 km
Lodz – road no. 1 and A1 to Piotrków Trybunalski, Road no. 1 south, road no. 51 (towards Katowice Airport) and motorway A4 to Gliwice; 220 km
Poznań – road no. 11 via Pleszew, Kluczbork, Lubliniec to Tarnowskie Góry, road no. 78 to Gliwice; 315 km
Wrocław – motorway A4 to Gliwice; 178 km

Railway connections

Gliwice offers direct railway connections with Hamburg, Berlin, Kiev, Lvov and most major Polish cities. A connection, changing in Katowice, is also available to Vienna, Prague, Budapest, Bratislava, Ostrava. Timetables and connections are available on Polish Railways home page – www.pkp.pl or www.bahn.de

It is possible to take a taxi from the Central Railway Station in Gliwice to ITT (a taxi rank is outside the station, journey time – approx. 7 minutes) or walk (approx. 15 minutes).
Detailed city map can be found in the internet at the address: http://www.um.gliwice.pl
General information

Gliwice is a medium size city of nearly 200 thousand inhabitants. The city is an important scientific, research and design centre in Poland. Thanks to Silesian University of Technology Gliwice is the second, apart from Warsaw, agglomeration of technical intelligence. On the other hand, Gliwice is also well known for its cultural life. Many festivals, concerts, exhibitions and other art activities take place in the town. Numerous famous Polish artists originally come from Gliwice. Results of many surveys show that Gliwice is one of the most attractive cities in Poland.

The city of Gliwice was established in the first half of the 13th century. Founded in 1276, it is one of the oldest towns in the area of Upper Silesia. It has undergone several historic transformations. The Silesian Piast monarchy, the Kings of Bohemia, the Austro-Hungarian Empire, Prussia and German Empire have ruled it. The city has again become a part of Poland in 1945.

Gliwice takes part in the Programme of Twin Cities. The cities associated with Gliwice are: Doncaster (UK), Valenciennes (France), Dessau (Germany), Salgotarian (Hungary), Nacka (Sweden). Gliwice also co-operates with Kezmarok (Slovakia) and Bottrop (Germany).

For more detailed information on the city history, historical sights, cultural events, industry, please refer to the following web services:

Gliwice: www.gliwice.eu
Silesia Region: www.slaskie.pl/en
http://gosilesia.pl/en/

Places to visit
- Caro Villa – Dolnych Wałów 8a, www.muzeum.gliwice.pl
- The Piast Castle – Pod Murami 2, www.muzeum.gliwice.pl
- Gliwice Radio Station Department of the Museum in Gliwice – Tarnogórska 129, www.muzeum.gliwice.pl
- Artistic Casting Department of the Museum in Gliwice – Bojkowska 37, www.muzeum.gliwice.pl
- Municipal Greenhouse – Fredry 6 (on the area of the Chopin Park)
- Town Hall – Market Square
- Main Post Office – Dolnych Wałów 8
- St. Peter and Paul’s Neo-Gothic Cathedral – Jana Pawła II 5
- All Saints Gothic Church – Kościelna 4, www.wszystkichswietych.org
- Ruins of the Municipal Theatre – Aleja Przyjaźni 18, www.teatr.gliwice.pl
- Medieval St. Bartholomew church – Bernardyńska 19

Selected tourist attractions outside Gliwice:
- A historical silver mine and Black Trout drift in Tarnowskie Góry, offering also an open-air exhibition of steam engine machines on the premises of the mine, www.kopalniasrebra.pl
- Historic coal mine GUIDO in Zabrze, exhibiting among others 1925 hoisting machine and rope pulley, original 19th century galleries, stables and chambers, 170 and 320 meters below ground, www.kopalniaguido.pl
- Mining exhibition Królowa Luiza in Zabrze – e.g. a working steam engine shaft hoist from 1915, www.luiza.zabrze.pl
- The places mentioned above are a part of The Industrial Monuments Route of the Silesian Voivodeship, www.zabytkitechniki.pl
- The Palace and Park Complex in Pławniowice – a beautiful example of residence architecture in Upper Silesia, www.palac.plawniowice.pl
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