



Polish-Swiss
Research Programme

Nanotechnologies

ICT

Energy

Health

Environment

The **TULCOEMPA** project based on the Swiss-Polish cooperation between the Technical University of Lodz (PL) and Empa in research and development of the innovative methods for monitoring in the civil engineering infrastructure.

This multidisciplinary project (2011 – 2015) focuses on **sustainable development of civil engineering** activities on increasing the carrying capacity of bridges and their **long-life monitoring with advanced wireless systems**.

Multipurpose program of the project covers two areas: civil engineering, as a component of the environmental infrastructure in general and structural health monitoring of buildings as a part of the information and communication technologies.

The project combines activities of two research fields: **innovative civil engineering (CE) techniques** and **modern systems of remote monitoring systems (ICT)**.

The first aim of the project is the pioneer worldwide application of the innovative prestressed carbon fiber reinforced polymer (CFRP) laminates strengthening system on the bridge in Szczercowska Wieś. While the second purpose of the ICT is to support the effectiveness of this strengthening technique by the long-life structural health monitoring (SHM) with the environmental effects (temperature and humidity).

Direct research results show their importance in scientific, industrial and social dimension.

Industrial dimension:

-commercialization of the innovative technologies and services that increases the competitiveness of the national and international industry

-support the transformation and modernization of industry in the civil engineering sector

Societal dimension:

-cost reduction of monitoring by easily deployable wireless monitoring

-increase in the social awareness of the alarming and the building maintenance safety

-extension of serviceability of the strengthened structures reduces costs of their replacement by new ones

-create new skilled job opportunities for qualified technical personnel

Awareness increase in the strengthened and monitored bridges serviceability decreases economical and environmental consequences of their replacement, both in the financial, energy and material resources, thus resulting in broad environmental protection.

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 **SWISS**
CONTRIBUTION



EMPA 
Materials Science & Technology