EUROPEAN UNION
European Regional Development Fund

OPERATIONAL PROGRAMME
SCIENCE AND EDUCATION
FOR SMART GROWTH

OPERATIONAL PROGRAMME "SCIENCE AND EDUCATION FOR SMART GROWTH 2014 - 2020"

Procedure:

CREATION AND DEVELOPMENT OF CENTRES OF COMPETENCE

Project: BG05M2OP001-1.002-0023-C01

Centre of Competence SMART MECHATRONIC, ECO- AND ENERGY SAVING SYSTEMS AND TECHNOLOGIES

The main objective of the project is to build sustainable functioning National Center of Competence “INTELLIGENT MECHATRONICS, ECO- AND ENERGY-SAVING SYSTEMS AND TECHNOLOGIES”, in which three sides of the "knowledge triangle" - education, research and business are in effective and dynamic interaction based on shared strategies, strong and concrete commitments and joint research projects and partnership.

Start: 30 March 2018 г. - **End:** 30 November 2023 г.

Budget : 23 569 719,17 BGN

- Significant modernisation of existing specialised research infrastructures: 4 859 206 BGN.
- Purchase of equipment necessary for implementation of scientific research and innovation programmes: 13 649 130 BGN, includes 12 779 373 BGN for Machinery and equipment, Laboratory and instrumentation, Computer equipment; 790 397 BGN for software and 79 360 BGN for Insurance costs.
- Implementation of market oriented research acivities and development/modification of new technologies at a high international level: 4 146 254 BGN.
- Wide distribution of the research results and introduction of new training and educational methods in centres‘ practice: 126 153 BGN.
- Transfer of knowledge and technology and implementation of specialised business research services : 220 456 BGN.
- Dissemintation of Information and Publicity, Independent External Audit, Costs for organisation and management: 568 520 BGN.

Beneficiary (Project partners):

Technical University of Gabrovo

Technical University of Sofia

Technical University of Varna

Sofia University “St. Kliment Ohridski”

Bulgarian Academy of Sciences - Institute of System Engineering and Robotics

Bulgarian Academy of Sciences - Institute of Electronics

Bulgarian Academy of Sciences - Central Laboratory of Applied Physics

Lead organization: Technical University of Gabrovo

Associated partners

Business organizations (Enterprises):

- "ABB Bulgaria" EOOD
- "AMK Drive and Control Technology" Ltd.
- "ECO PROJECT" Ltd.
- "Caproni" JSC
- "Mechatronics" JSC
- "Milara International" Ltd.
- "Podemcrane" JSC
- "First" Ltd.
- "Ceratizit Bulgaria"

Business organizations (Business associations (NGOs)):

- Cluster "Thrace economic zone"
- Cluster "Mechatronics and Automation"
- Green Synergy Cluster
- Bulgarian Branch Chamber - Mechanical Engineering
- Chamber of Commerce - Stara Zagora
- Gabrovo Chamber of Commerce and Industry
- Industrial Economic Association/Chamber of Commerce "- Gabrovo

Scientific organizations:

Technical University of Berlin and Technical University of Liberec

Structure of the Centre of Competence

Knowledge and Technology Transfer Committee

Manager
Deputy Manager

Management Team

1.Coordination
2.Finance
3.Projects
4.Monitoring and control
5.Investments
6. Legislation

Advisory Board
Research Committee
Administrative Committee
Financial Committee
TU – Gabrovo
TU - Sofia, branch Plovdiv
TU – Varna;
SU –Faculty of Chemistry and Pharmacy
BAS – ISER;
BAS – IE
BAS – CLAP –Plovdiv
Cluster Thrace economic zone
Mechatronics and Automation Cluster,
Geen Energy Cluster
Chamber of Commerce – Gabrovo/Stara Zagora
BBC-Machine Building
BIA-Gabrovo

Lab complexes/research teams for applied research

Smart mechatronic systems

2.Smart mechatronic systems for measurement and control
3.Electronics and sensors -
4.Distributed systems and intelligent sensor networks in mechatronics
5.Robotics and smart automation systems
8.Smart mechatronic systems in the mean of transport and automotive industry

Energy-efficient systems and clean technologies

1.Energy-efficient systems and technologies for design and manufacture of high-tech products
6. Nanostructured materials and dispersion systems
7.Smart energy-efficient systems and technologies

Dissemination
Training and Qualification Programmes

Introduction of new training and educational methods

Training and qualification programmes
For undergraduate and postgraduate students and specialists
Training in Mechatronics

Training in Clean Technologies

Marketing and Dissemination of research results

1.Dissemination of research results
Seminars and conferences
•Forums
•Open Days
•Media and publications
2.Communication – Centre web site

Knowledge and Technology Transfer Committee

Manager/ Deputy Manager

Management Team

1.Coordination
2.Finance
3.Projects
4.Monitoring and control
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Advisory Board

Research Committee
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TU – Gabrovo
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Cluster Thrace economic zone
Mechatronics and Automation Cluster,
Geen Energy Cluster
Chamber of Commerce – Gabrovo/Stara Zagora
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Management

Lab complexes/research teams for applied research

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Dissemination Training and Qualification Programmes

Introduction of new training and educational methods

Training and qualification programmes for undergraduate and postgraduate students and specialists

Training in Mechatronics

Training in Clean Technologies

Marketing and Dissemination of research results

1.Dissemination of research results:
- Seminars and conferences
- Forums
- Open Days
- Media and publications

2.Communication – Centre web site

Expected results:

- Capacity building of research and innovation teams in the field of ISIS, by attracting leading researchers and exchanges between the project team and leading research organisations;
- Retention and solicitation in Bulgaria of young researchers, scholars and PhD students by creating modern conditions for research activities;
- Distribution and practical application of the achieved research results and transfer of knowledge by applying new training methods;
- Commercialization of the results of the research packages through development and popularization of a portfolio of patents and utility models;
- Development and implementation of innovative technologies and products in the field of mechatronics and clean technologies, by developing cooperation with business;
- Enhancing the opportunities to involve the scientific teams in projects and programmes at international level, working in close cooperation with prestigious European scientific institutions;
- New opportunities for cooperation between science and business, providing SMEs access to specialized business services.

Performance indicators:

• Collaborative research projects developed between the Centre for competence and business -14;

• Newly built infrastructure complex: Competence Centre **“Intelligent Mechatronic, eco-and energy-saving systems and technologies"**– 1., of which 33 laboratories in 8 Laboratory complexes;

• Research, Innovation: New researchers in assisted subjects 25 (full-time equivalent);

• Research, Innovation: Researchers working in improved infrastructural research sites-42 (full-time equivalent).

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Scientific packages (laboratory complexes) and laboratories:

1. «Energy-saving systems and technologies for design and production of high-tech products» (4 laboratories)

C 1-1: Energy-saving technologies for life cycle extension and operational security improvement (TU-Gabrovo – Training Corpus 1)

C 1-2: CAD/CAM Systems for design and production of high-tech products (TU-Gabrovo – building 2, Production Hall)

C 1-3: Additive and energy saving technologies and equipment
Operational security (TU-Gabrovo – building 2, Production Hall)

C 1-4: Intelligent Technologies based on intense energy flows (TU-Gabrovo – building 2)

Scientific packages (laboratory complexes) and laboratories:

2. «Intelligent Mechatronic Measurement and Control Systems» (3 Laboratories)

C 2-1: Intelligent Mechatronic systems for measuring static and dynamic values (TU-Gabrovo-Building 2)

C 2-1: Intelligent systems for examining the structure and properties of materials (TU-Gabrovo – Building 2)

C 2-3: Survey of underwater noises, signals and vibrations of marine vessels and equipment (TU-Varna)

Scientific packages (laboratory complexes) and laboratories:

3. «Electronics and Sensors» (2 Laboratories)

C 3-1: Development of sensory elements for humidity, gases and temperature based on oxide nanostructured materials, obtained by Sol-gel technology and examination of the parameters and characteristics. Analysis of data from a multi-sensor system based on gas sensors (TU-Gabrovo – Building 2)

C 3-3: Electronic and microprocessor devices and systems (TU-Gabrovo – Building 2)

Scientific packages (laboratory complexes) and laboratories:

4. «Distributed systems and smart Sensor Networks» (5 Laboratories)

C 4-1: Intelligent infrastructure in ITC (TU-Sofia, Corpus 2 – Plovdiv)

C 4-2: Data processing from sensor networks and distributed embedded systems (TU-Sofia, Corpus 2 – Plovdiv)

C 4-3: Processing and storage of large volumes of data in intelligent systems (TU-Sofia, Corpus 2 – Plovdiv)

C 4-4: Processing of visual information in intelligent transport systems (TU-Sofia, Corpus 2 – Plovdiv)

C 4-5: Biosensors and data processing in systems for support of elderly people and high-risk patients (TU-Sofia, Corpus 2 – Plovdiv)

Scientific packages (laboratory complexes) and laboratories:

5. «Robotics and Intelligent Automation Systems» (5 laboratories)

C 5-1: Smart (intelligent) and specialized robots (TU-Sofia, Corpus 3 – Plovdiv)

C 5-3: Intelligent Automated production systems (TU-Sofia, Corpus 3 – Plovdiv)

C 5-4: Robotics and Mechatronics (IR-BAS-Sofia)

C 5-5: Collective Robotics (IR-BAS-Plovdiv)

C 5-6: Special electric Drives in robotics (TU-Sofia, Corpus 3 – Plovdiv)

Scientific packages (laboratory complexes) and laboratories:

6. „Nano-structured materials and disperse systems in pure technologies" (2 laboratories)

C 6-1: Innovative Nanostruktured materials (SU – FHP)

C 6-2: Disperse systems and rheology in clean technologies (SU – FHP)

Scientific packages (laboratory complexes) and laboratories:

7. «Intelligent Energy saving systems and Technologies» (7 Laboratories)

C 7-1: Methods and means for solving energy and infrastructure problems related to mass electrical mobility (TU-Gabrovo-building 2)

C 3-2: Eco-and energy-saving, contactless electric power transmitters (TU-Gabrovo – Building 2)

C 7-2: Electric vehicle and electric power-in-demand – Modern energy-efficient electrical components and systems with application in the industrial sector (TU-Gabrovo – Building 2)

C 7-3: Ecological, energy-saving and electromagnetically compatible photometric, LED and Renewable Energy Sources components and technologies (TU-Gabrovo-Building 2)

C 7-4: Energy efficient systems and technologies using thermal and hydraulic power and secondary and renewable energy sources (TU-Gabrovo – Building 2)

C 3-4: Drive and positioning systems (TU-Gabrovo – Building 2)

C 7-5: Integrated energy-saving technologies (TU-Sofia, Corpus 3 – Plovdiv)

Scientific packages (laboratory complexes) and laboratories:

8. «Intelligent Mechatronic systems in the means of transport and industry» (5 Laboratories)

C 8-1: Automobile Mechatronic Systems (TU-Sofia, Corpus 3 – Plovdiv)

C 8-2: Integrated systems for design and manufacturing in the automobile industry (TU, Corpus 3 – Plovdiv)

C 5-2: Autonomous aircrafts (TU, Corpus 3 – Plovdiv)

C 8-4: Optical and laser technologies in the automotive industry (TU-Sofia, Corpus 3 – Plovdiv)

C 8-5: Industrial Nanotechnology (CLAP – Plovdiv)