

Project BG05M2OP001-1.002-0019: „Clean technologies for sustainable environment – waters, waste, energy for circular economy“ (Clean&Circle) for creation and development of a Centre of Competence

www.clean-circle.eu

Leading organization: Sofia University "St. Kliment Ohridski" Partners

- University of Architecture, Civil Engineering and Geodesy;
- University of Forestry – Sofia;
- "Prof. Dr. Assen Zlatarov" University – Bourgas;
- Institute of Physical Chemistry "Academician Rostislav Kaishev" – Bulgarian Academy of Sciences;
- Institute of Organic Chemistry with Center for Phytochemistry – Bulgarian Academy of Sciences;
- Institute of Microbiology "Stefan Angelov" – Bulgarian Academy of Sciences;
- "Cleantech Bulgaria" Foundation.

Associate Partners

- Sofia Municipality
- Sofia Waste Treatment Plant;
- "Sofiyska Voda" AD,
- Interplast BG Ltd.,
- Energy Agency – Plovdiv,
- University of Modena, Italy

Project budget:

Total cost: 23 667 925.86 BGN

European structural and investment funds: 20 117 736.97 BGN

National co-financing: 3 550 188.89 BGN



clean circle
BG05M2OP001-1.002-0019

„Чисти технологии за устойчива околна среда – води, отпадъци, енергия за кръгова икономика“

ПАРТНЬОРИ

УНИВЕРСИТЕТ "СВ. КЛИМЕНТ ОХРИДСКИ" СОФИЯ

УНИВЕРСИТЕТ ПО АРХИТЕКТУРА СТРОИТЕЛСТВО И ГЕОДЕЗИЯ

УНИВЕРСИТЕТ ПО ЛЕСНИЧЕСТВО И ОБОЯВЕНА ТЕХНОЛОГИЯ

УНИВЕРСИТЕТ "ПРОФ. ДР. АСЕН ЗЛАТАРОВ" БУРГАС

ИПЧ

ИНСТИТУТ ПО ФИЗИКАЛНА ХИМИЯ "АКАДЕМИК РОСТИСЛАВ КАЙШЕВ" БАНКА

ИНСТИТУТ ПО ОРГАНИЧНА ХИМИЯ С ЦЕНТЪР ЗА ФИТОХИМИЯ БАНКА

CLEANTECH BULGARIA

АСОЦИИРАНИ ПАРТНЬОРИ

Софийска община

ЕНЕРГИЙНА АГЕНЦИЯ ПЛОВДИВ

Interplast BG

UNIMORE

Обща стойност: 23 667 925, 86 лв.
Финансиране от Европейските структурни и инвестиционни фондове: 20 117 736, 97 лв.
Национално съфинансиране: 3 550 188, 89 лв.

www.clean-circle.eu www.eufunds.bg

Term of implementation: 30 March 2018 – 30 November 2023

Project aim

Building effective infrastructure and research capacity to develop innovations in the circular economy focusing on water, energy and waste management.

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Project BG05M2OP001-1.002-0019: „Clean technologies for sustainable environment – waters, waste, energy for circular economy“, financed by the Operational programme “Science and education for smart growth” 2014-2020, co-financed by the European union through the European structural and investment funds

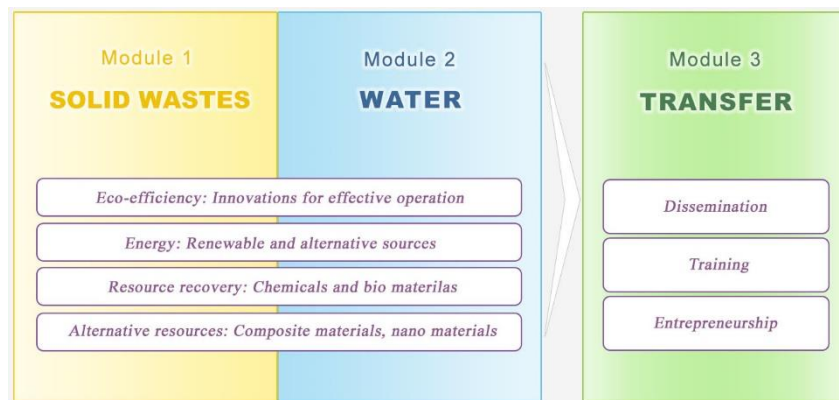
Brief project description

The establishment of the **EFFECTIVE INFRASTRUCTURE** includes:



- Build and equip Center of Competence “Clean and Circle” on a plot of 5000 m², Sofia, 1 Dzheims Baucher str.;
- CoC “Clean and Circle” – 12 laboratory complexes and 1 accelerator for technological entrepreneurship and transfer;
- CoC “Clean and Circle” building – Living Lab;
- Significant modernization of laboratories in UACG and the Faculty of Physics of SU.

The strengthening, enhancement and developing of **the RESEARCH CAPACITY** will be realized in three modules.



The horizontal priorities will include activities relating to the circular economy and achievement of energy and resource efficiency through:

- Innovations through efficient operation of the water and waste treatment facilities and of the water supply and sewerage networks;
- Increasing the share of the renewable and alternative energy sources by producing biogas, bioethanol, biodiesel, hydrogen, hydro power, combined with sediment bioremediation technologies and solving of crucial environmental problems;
- Recovery of resources such as phosphorus, precious and rare metals, bioremediation of sludge, soils and sediments that have accumulated toxic pollutants;
- Obtaining alternative resources – zeolite from ashes, slags, cake, new construction and composite materials from waste, RDF fuel, high quality bio-fertilizers from composting plants, microbiological detoxification preparations, etc.

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The activities in the CoC will be integrated into an **ELECTRONIC CLOUD** for the exchange and rapid use of information of large complexes of ecological data, as well as for its structuring in dedicated electronic cards.

The **STRATEGIC PROGRAM** for the development of the research and innovation of the center will be accompanied by a business plan and selection of the most effective channels for economic and technological realization.

- The distance “scientific achievements” – “high education” – “real technologies” – “business” will be shortened.
- They will lead to an increase in the competitiveness of the Bulgarian economy with high ecological and social added value.

Expected research and innovation outcomes

- Analyzed and evaluated potential for energy efficiency of urban and industrial water systems.
- Creation and application of detoxification technologies for water, sediments and sludge bioremediation;
- Suggested methods for effective energy generation and use, like ultrasound substrates treatment, fuel and electrolysis cells to produce biogas and hydrogen from waste water, etc.;
- Developed, automated, verified, commercialized and implemented system for control of the methanogenesis process based on fluorescence techniques;
- Introducing of the new systems for the management of the eco- and clean-technologies on the base of biosensing and biorobots;
- Established new approach for non-reactive purification of fluids heavily contaminated with heavy metals (copper) and nitrates;
- Obtaining of the new material for the innovative technologies of purification of waters and air by means of transforming of wastes;
- Obtaining of new building materials from building wastes, from ash and plastic wastes;
- Obtaining highly specialized biofertilizers on the base of well managed composting technologies;
- Creation of sustainable ecosystem from well educated young researchers with complex multidisciplinary knowledge, skills, high qualification and inno-creative potential.

Expected benefits of project implementation

Center of Competence “Clean and circle” for development and innovations in the circular economy will be established with focus on water, energy and solid waste management. Along with the significant material part – modern infrastructure, including building and equipment, high scientific/technological/applied potential will be developed as a precondition for sustainability. The



benefit of society will be the results of scientific experiments aimed at a green economy, with less use of resources, less polluting emissions and significant economic impact.