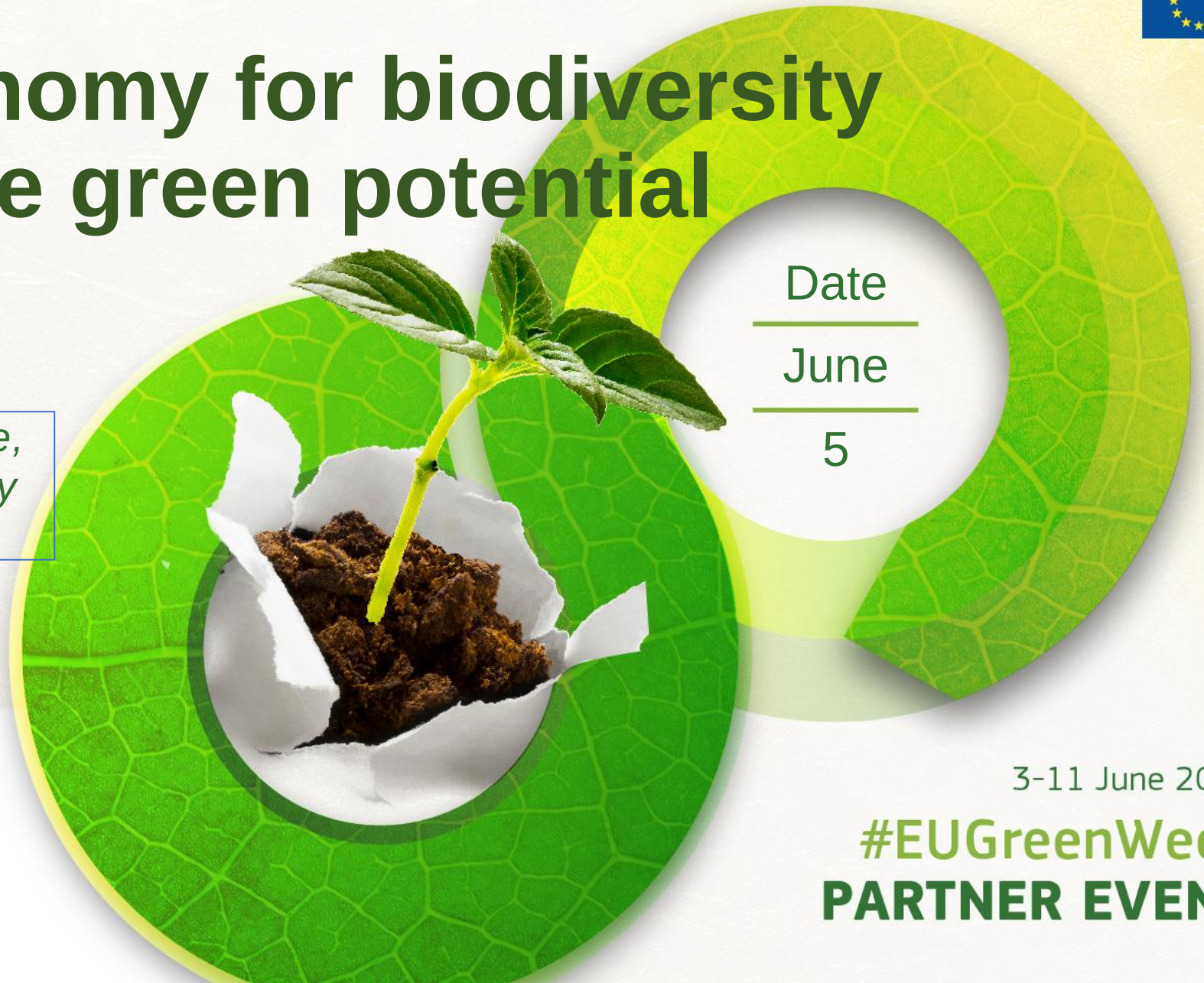
Circular economy for biodiversity
Unlocking the green potential

Skills for sustainable, resilient, and socially fair communities

EUROPEAN YEAR OF SKILLS



Date

June

5

3-11 June 2023

#EUGreenWeek

PARTNER EVENT

Short introduction of the institution

University of Pannonia

Faculty of Business and Economics

Faculty of Engineering

Faculty of Modern Philology and Social Sciences

Faculty of Information Technology

Faculty of Business Administration Zalaegerszeg

- The best university in Hungary in terms of research and development output per lecturer
- World-class education, internationally high publication rates
- Marketable knowledge, creative atmosphere, sustainability
- Innovative solutions both at regional and global level

Research institutes, competences

- Research Centre for Biochemical, Environmental and Chemical Engineering
- Centre for Natural Sciences
- Institute of Mechatronics Engineering and Research
- Research Centre for Engineering Sciences
- Research Institute of Biomolecular and Chemical Engineering
- Soós Ernő Water Technology Research and Development Centre
- Sustainability Competence Centre (Circular Economy Competence Centre, Waste Management Competence Centre)
- National Laboratories (Water science and safety, Climate change, Social innovation, Renewable energies)
- Circular Economy Technology Platform
- Regional Innovation Platform Veszprém
- Under planning: Circular Economy Science Park

Main R&D

- Waste management, waste treatment, renewable energies, energy management, waste minimization
- Water treatment technologies, air pollution, green chemistry
- Sustainable cities, sustainable tourism
- Circular economy and sustainability
- Process development, process integration and optimization
- Material science, bio- and nanotechnology
- Environmentally friendly engine fuels and propulsion methods
- Advanced structural materials and catalysts

Main infrastructure

- Main and specialized analytical facilities to investigate the properties of raw materials and products
- Specialized reactor systems from micro scale to bench scale (e.g. high temperature, high pressure, catalysts)
- Main engineering (e.g. chemical, environmental, biochemical, material, mechanical) processes in lab scale
- Engineering software to model and optimize the process parameters
- Waste based processes
- Cooperation with industrial partners to ensure the process implementation in operating environment
- Assesment of Social and economic aspects of climate change
- Citizen Science
- Under construction: gasification, reactor for synthesis fuels and alcohol production, waste pyrolysis, steam cracking, bench scale chemical reaction for sustainable processes

Expertise

Main projects

- Waste management and treatment: development of sorting technology, valuable secondary raw material, mechanical recycling
- Renewable energies: pyrolysis, gasification, energy management, scale-up, chemical recycling, CCU/CCS, gas cleaning
- Water technologies: industrial and residential wastewater, DS and EOR water purification, micro plastics removal, sewage sludge utilization
- Climate change
- Sustainable cities: smart city, creation of circular models, modelling
- Sustainable tourism: reducing seasonality, reducing the ecological footprint of festivals methodology
- Circular economy and sustainability environmental education, attitude and attitude formation

Role in consortium

- Development in core and specialized engineering problems
- Waste based processes, green technologies, circular economy related subjects
- Process and operation unit optimization and modelling, scale-up, process design, product design
- Value chain development, processes and products with less environmental loading
- Green and sustainable processes in industrial environment
- Citizen Science creation, Business Plan related to the biodiversity protection
- Demonstrated effective and inclusive integrated approaches to the management of landscape, soil, water and vegetation at a regional level
- Demonstrated economic feasibility of these solutions, ensuring their long term sustainability

Main projects

- Hungarian-Indian (KTIA-DST) R&D&I Program (TÉT_13_DST-1-2014-0003) “Clean Fuel Recovery by chemical recycling of plastic and biomass waste
- Hungarian-Indian (KTIA-DST) R&D&I Program (2019-2.1.13-TÉT_IN-2020-00071) Applied industrial research for the thermolytic recovery of sludge-like wastes for the Circular Economy and Biogeochemical Cycle
- Horizon 2020, Marie Curie Research and Innovation Staff Exchange (RISE) (MSCA-RISE-2014 (Flexi-pyrocat, No.: 643322)) “Development of flexible pyrolysis-catalysis processing of waste plastics for selective production of high value products through research and innovation”
- Horizon 2020, Marie Curie Research and Innovation Staff Exchange (RISE) (MSCA-RISE-2018 (BIOMASS-CCU, No.: 823745)) “Biomass gasification with negative carbon emission through innovative CO2 capture and utilisation and integration with energy storage”
- Horizon 2020, Marie Curie Research and Innovation Staff Exchange (RISE) (MSCA-RISE-2019 (ZEOBIOCHEM, No.:872102)) “Advanced Zeolite Catalysis for Sustainable Biorefinery to Produce Value-added Chemicals”
- Sustainability competence centre based on circular economy at Pannon University (2019-1.3.1-KK-2019-00015)
- Production and validation of synthetic fuels in collaboration with large companies and universities
- National Laboratory of Renewable Energies (RRF-2.3.1-21-2022-0009)
- Establishment of a competence Centre for waste management at the University of Pannonia (2022-1.1.1-KK-2022-00002)
- HORIZON-MISS-2022-OCEAN-01-02: Danube Wetlands and flood plains Restoration through systemic, community engaged and sustainable innovative actions

Topic and project idea

Proposed topics

- Waste minimization and sustainable waste utilization towards positive techno-economic aspects
- Institutional cooperation between academic and industrial sector to develop the commercialization and positive aspects of green processes
- Cross-border projects in sustainable processes, waste minimization and energy reduction
- Development in Technology Readiness Level of processes
- Development in core and specialized engineering problems
- Process and operation unit optimization and modelling
- Scale-up, process design, product design
- Energy intensification, reduction of energy dependence, advanced methods to achieve positive energy balance
- Value chain development, processes and products with less environmental loading
- Wastewater treatment and sewage sludge utilization
- Hydrogen production, transportation and storage
- CO_2 reduction and utilization

Project calls

- Testing and demonstrating transformative solutions increasing climate resilience of the agriculture and/or forestry sector: TOPIC ID: HORIZON-MISS-2023-CLIMA-01-01
- Mission Climate adaptation, Mission Ocean & waters and Mission Soil Deal for Europe – Joint demonstration of an integrated approach to increasing landscape water retention capacity at regional scale: TOPIC ID: HORIZON-MISS-2023-CLIMA-OCEAN-SOIL-01-01
- Pathways to Synergies: TOPIC ID: HORIZON-WIDERA-2023-ACCESS-04-01
- Excellence Hubs: TOPIC ID: HORIZON-WIDERA-2023-ACCESS-07-01

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