# REVITALIZATION'S FUTURE OF LANDFILL AS A LAND ASSET


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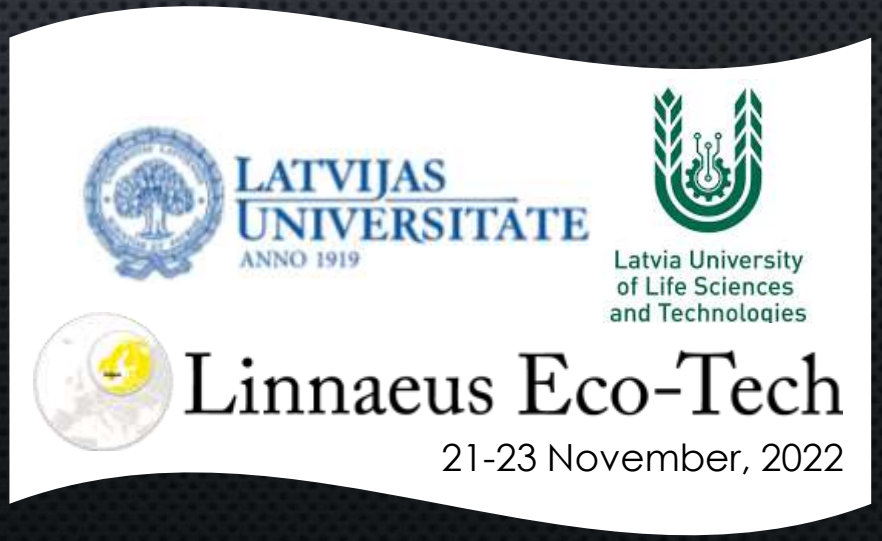


# INTRODUCTION

THE AIM OF WORK IS TO PROVIDE SCIENTIFICALLY APPROVED RECOMMENDATIONS FOR **LAND RECOVERY AND ECOSYSTEM REVITALIZATION IN LANDFILLS** IN CIRCULAR ECONOMY PERSPECTIVE

# BENEFITS

**BENEFITS**
from landfill revitalization

**ECONOMIC**

- Savings from unimplemented contaminant monitoring
- Income from the recovery of landfill mixed material
- Financial gains from the site redevelopment
- Increase in the land asset value

**AESTHETIC**

- Holistic perspective for urban, periurban and rural long-term planning
- Site development in favor of the needs of society
- Well-kept landscape
- Strengthened environmental awareness in society

**ENVIRON-MENTAL**

- Mitigation of human and animal health risks
- Reduction of polluted sites
- Recovery of ecosystems
- Reduction of GHG emissions
- Leachate treatment and purified water return
- Geotechnical safety

**LEGAL / POLICY**

- Compliance with environmental management and planning documents
- Restrictions cancelled and openness of the site for new perspectives
- Step forward to environmental sustainability

# LANDFILL MINING

- Recovery (excavation) of materials and energy from historically dumped waste as an innovative and sustainable approach
- Reducing greenhouse gas emissions
- Implementing landscape restoration

# TOWARDS NEW MARKET

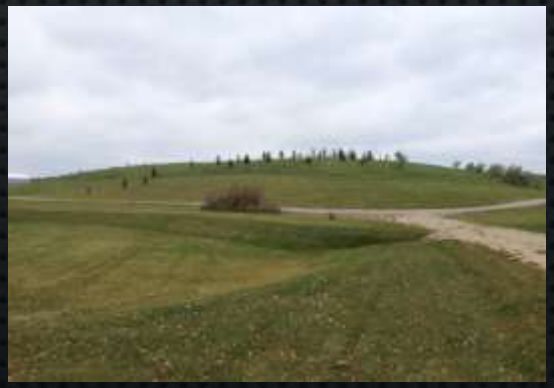
Over-production → Over-consumption → Fresh waste → Old waste and pollutionn

Well established market

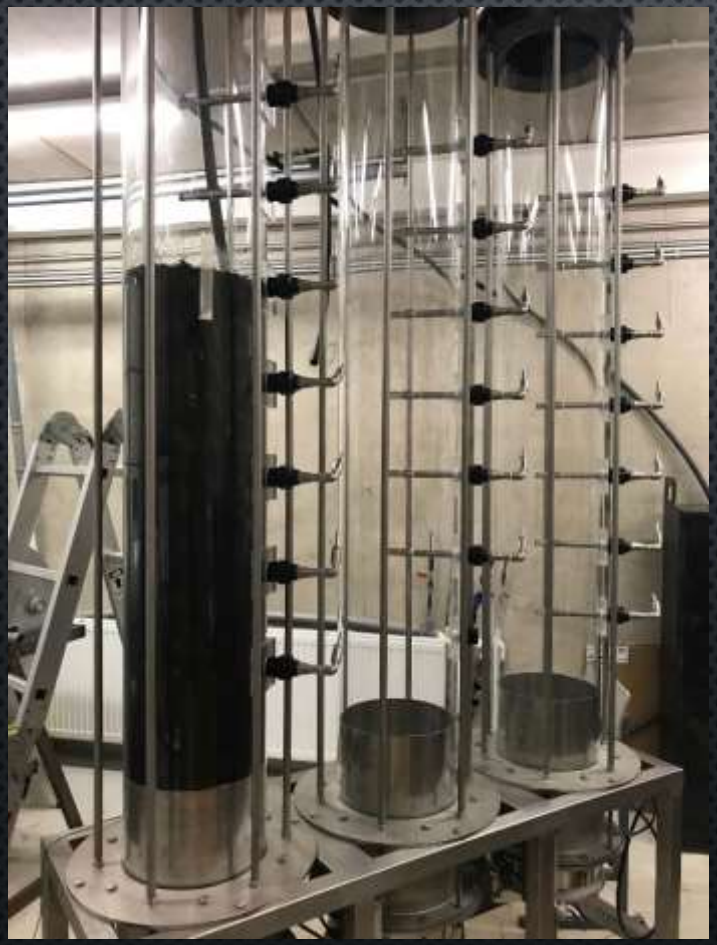

Completely new market

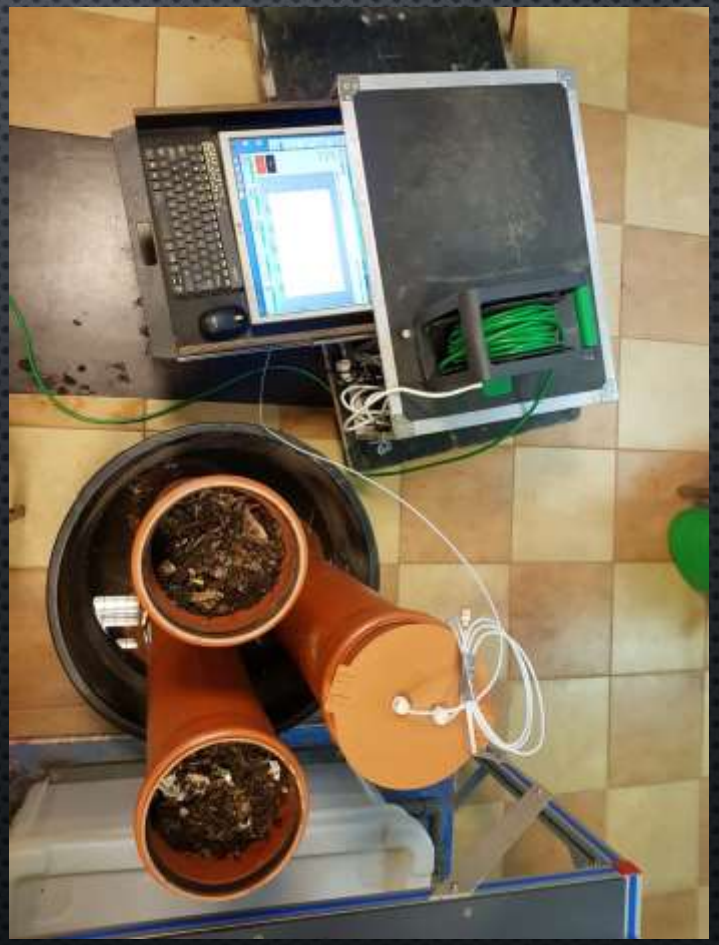
# STUDY APPROACH

- SAMPLING IN LANDFILLS/DUMPS BY SELECTING REPRESENTATIVE HOMOGENOUS REJECTED MATERIAL FOR ANALYSIS
- INNOVATIVE LANDFILL CAPPING INCLUDES LANDFILL MINING, WHERE FINE FRACTION IS USED MIXED WITH SOIL AND VEGETATION TO IMPROVE GREENHOUSE GAS (METHANE) DEGRADATION BY NATURAL MEANS – THE MOST ADEQUATE RECIPE FOR NEW CAPPING MATERIAL IS THE CHALLENGE
- QUANTITATIVE AND QUALITATIVE STUDIES



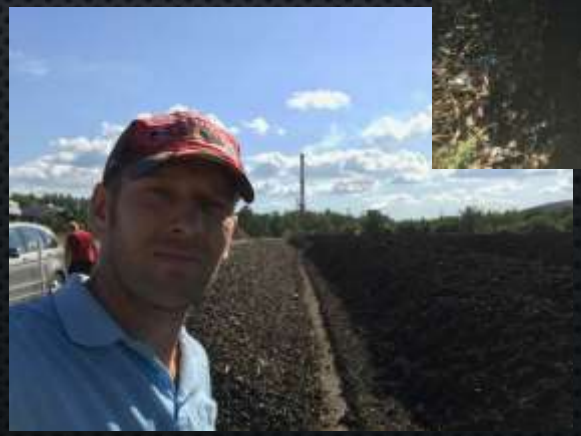
# COMPARISON OF STUDIES & DATA



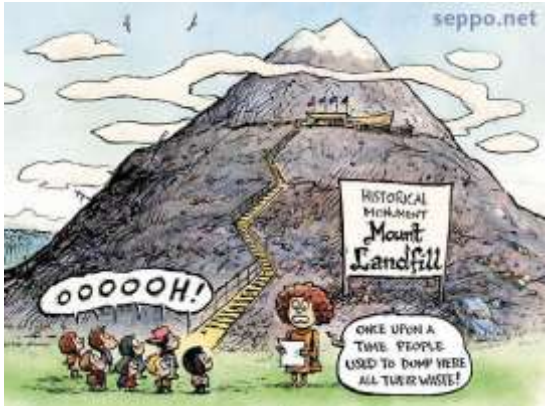


# CHALLENGES

- Methane degradation and biowaste separation with its valorization
- Experimenting with various biowastes as amendments to stabilize fine fractions of rejected material
- Outside the experimental design and measurements of methane gas



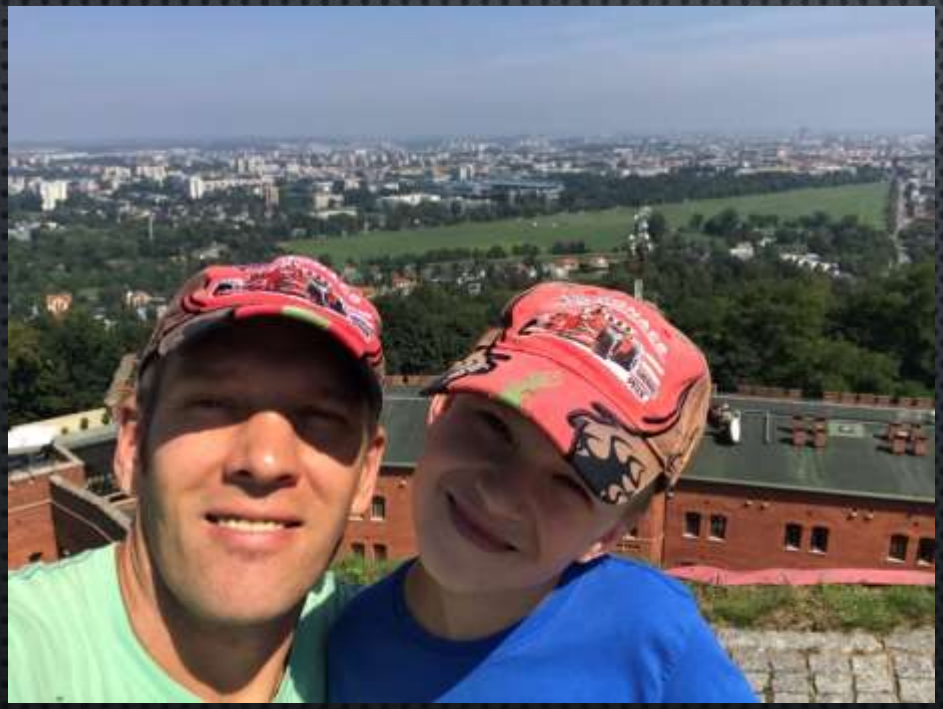
# OLD LANDFILLS AT A GLANCE

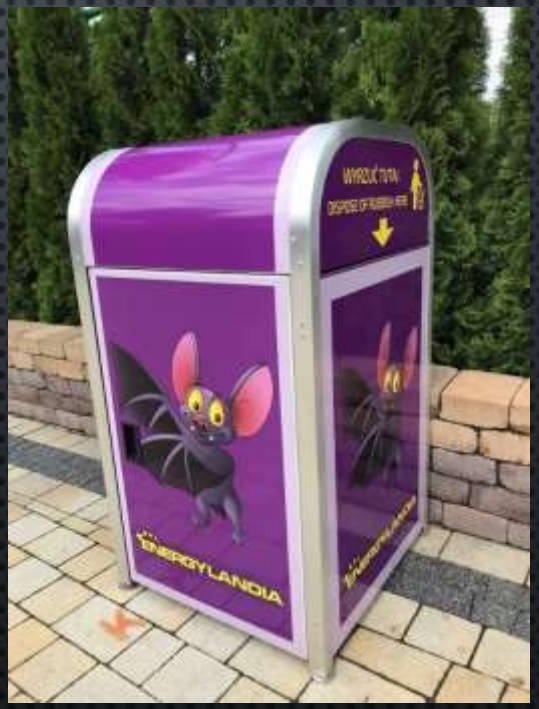



# CONCLUSIONS

- Sustainable closure of landfills is a significant step toward the circular economy
- Assessment & calculations of emissions prove that biocover is a feasible option
- Contents of rejected material from a geochemistry point of view can be taken into account for further options
- The future of landfills involves logistics centres for recycled material and industrial/thematic parks through the revitalization of degraded areas

# TEAM WORK





# ACKNOWLEDGEMENTS

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# Takk!