WEBINAR

GOLD

Phy2Climate

CERESiS

Phytoremediation
with energy crops for biofuel production

Wednesday 15 March 2023
10:00 -12:00 CET

GOLD
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CERESiS
Richard Lord,
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Phy2Climate
Alfreda Kasiulienė,
Biovala

Round Table Chair
Markus Puschenreiter,
Institute for Soil Research (IBF)

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Introduction

GOLD, CERESiS, Phy2Climate:

Three different projects with the same goal

- **Programme:** Horizon 2020 Framework Programme
- **Work programme part:** Secure, clean and efficient energy
- **Call:** BUILDING A LOW-CARBON, CLIMATE RESILIENT FUTURE: SECURE, CLEAN AND EFFICIENT ENERGY (H2020-LC-SC3-2018-2019-2020)
- **Funding:** Combined clean biofuel production and phytoremediation solutions from contaminated lands worldwide

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The Challenge

Dedicated biofuel production at large scale depends on sustainable land availability that does not compete with other uses.

Phytoremediation is a holistic approach that has the potential to manage land contaminated with a wide range of pollutants.

The challenge is to:

bridge the gap between phytoremediation strategies and clean biofuel production

in a sustainable and optimum manner that will overcome the indirect land use change (iLUC) issue for biofuels and restore lands for agricultural uses.

Photo credit: Project GOLD

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The Scope

Optimise energy crops for phytoremediation by targeting different classes of known soil pollutants and integrate in the conversion process to biofuels a strategy to extract these pollutants in concentrated form.

- Pilot-scale, small trials are expected for both clean biofuel production and phytoremediation processes.
- International cooperation is encouraged.
- Technologies from TRL 3-4 to TRL 4-5.
- Funding from the EU of between EUR 2 to 4 million.

Photo credit: Project GOLD

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Expected Impact

Win-win situation!

Bringing polluted land back to agricultural production and for low-iLUC risk liquid biofuel production from energy crops.

- Cost reduction and improved phytoremediation
- Contribution to several sustainable development goals (SDGs)
- Clean energy
- International Cooperation

Photo credit: Project GOLD

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The Process

1. Crop & site selection
2. Field trials
3. Harvest
4. Conversion
5. Assessment & recommendations

This webinar will cover points 1 – 3.

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The Process – Conversion Summary

GOLD - two conversion routes; **High temperature entrained flow gasification, and Autothermal biomass pyrolysis**.

- High temperature entrained flow gasification will produce a clean syngas which is further fermented into liquid biofuels. Autothermal Biomass Pyrolysis with the subsequent upgrading of the bioproducts into refinery-compatible intermediates and Fischer–Tropsch Fuels.

Phy2Climate - applies a **biorefinery process based on thermo catalytic reactions consisting of a synergistic combination of technologies** relating to each other.

- All generated intermediates will be further converted in a second step to clean drop-in biofuels for the road and shipping transport sectors applying different technologies such as distillation, electrooxidation and GtL.

CERESiS - **two thermochemical processes, Supercritical Water Gasification (SCWG) with Fischer–Tropsch upgrading and Fast Pyrolysis (FP)**

- are combined with novel separation technologies, for the conversion of the harvested energy crops into biofuels or biofuel precursors.

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The Webinar

The first step in bridging the gap is by determining the best energy crops to grow on contaminated soil, that will not only facilitate the remediation of the soils but will also provide the highest yield of feedstock for producing liquid biofuels.

All three projects have now completed at least one year of field trials, on low iLUC lands, all around the world.

In this webinar we will hear how successful the phytoremediation part of the research has been.

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Agenda

- **GOLD**: Eleni G. Papazoglou, Agricultural University of Athens

  7 sites – Greece, France, Poland, China, Italy
- **Phy2Climate**: Alfreda Kasiuliene, Biovala

  4 sites - Spain, Serbia, Lithuania, Argentina
- **CERESiS**: Richard Lord, University of Strathclyde

  8 sites – Brazil, UK, Ukraine, Italy

- **Round table discussion**

  Chaired by: Markus Puschenreiter, Institute for Soil Research, University of Vienna, Austria

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