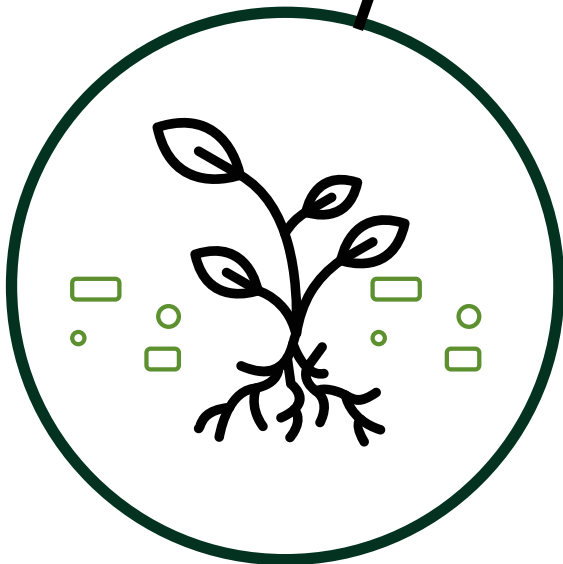
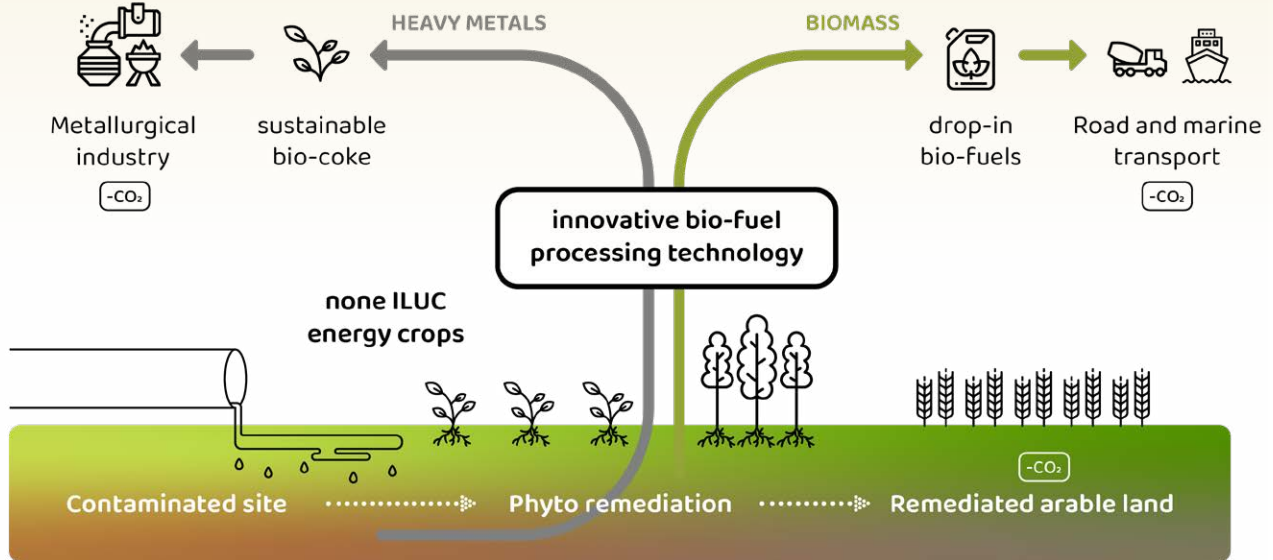


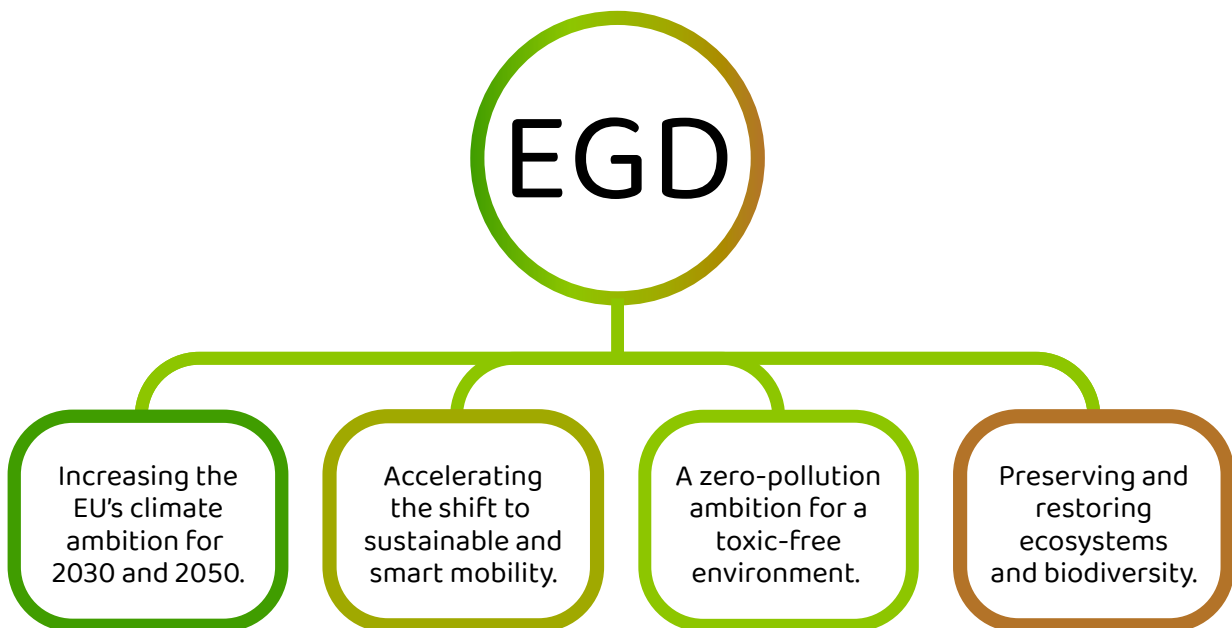
Regulatory Issues and Opportunities for Phytoremediation and Recovery of Output Materials in the EU



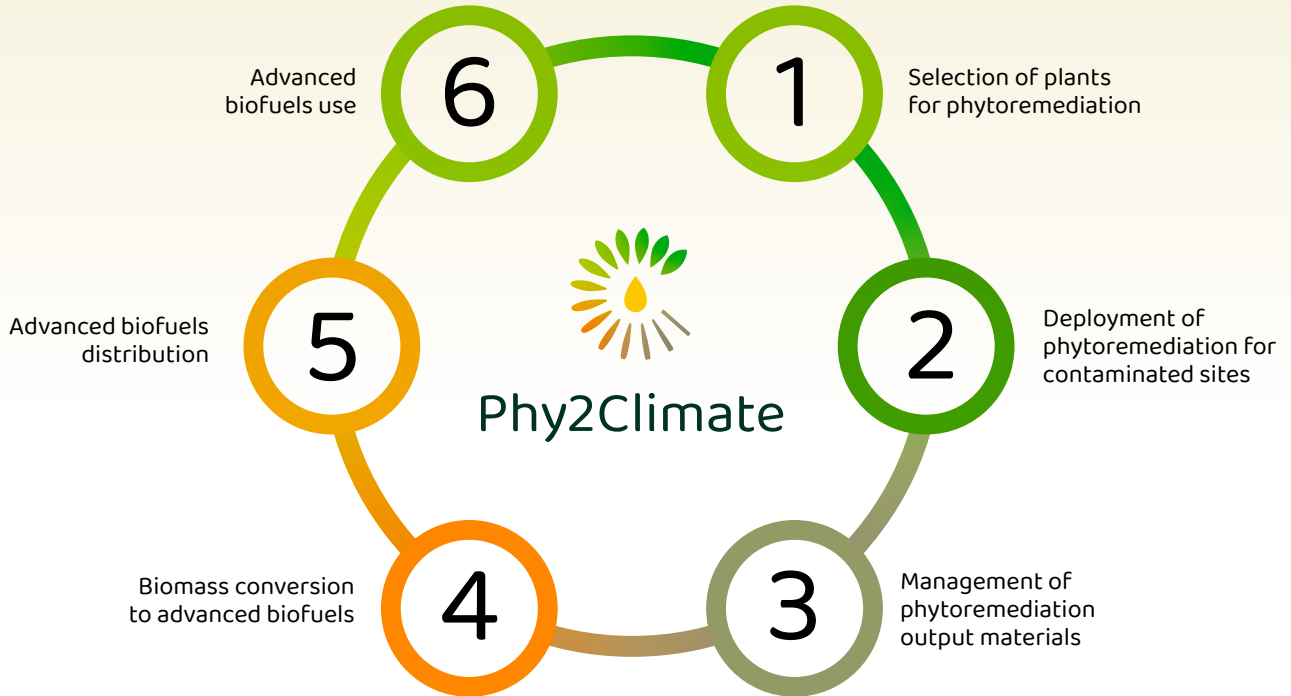
The goal of Phy2Climate is to bridge the existing gap between the adoption of nature-based solutions for remediation of contaminated sites through phytoremediation with the production of clean drop-in biofuels. In this respect, the project aims to address two compelling environmental and climate issues at the EU level, restoration of contaminated land and indirect Land Use Change (iLUC) arising from energy crops demand. In this way, Phy2Climate aims to significantly contribute to several flagship EU policies under the European Green Deal (EGD) and to implement up to 16 UN 2030 Sustainable Development Goals.



The value chain embraced in Phy2Climate provides multiple benefits in relation to several EGD objectives. By providing a nature-based solution to remediate contaminated soils to transform them in arable land and generate advanced, low-ILUC biofuels, the Phy2Climate approach will contribute to the following policy pillars and objectives of the EGD:



The Phy2Climate innovative value chain can be analytically broken down into at least six key elements, which flow from the preparation and implementation of phytoremediation strategies in contaminated sites (Steps 1-3) to the conversion of the phytoremediation output materials into advanced biofuels (Steps 4-6).



Every step across the above value chain, however, faces specific legal roadblocks related to either the institutional fragmentation, the lack of comprehensive legal frameworks, silos-thinking and policy-making, or technical barriers in the regulatory framework. The most relevant obstacles down each of the analytical steps of the value chain as identified through desk-based research are illustrated below.



A stakeholder survey conducted for the purposes of the project has highlighted the following main legal roadblocks throughout the uptake of the above value chain. Stakeholders were requested to rank different legal barriers based on the following expected magnitude:

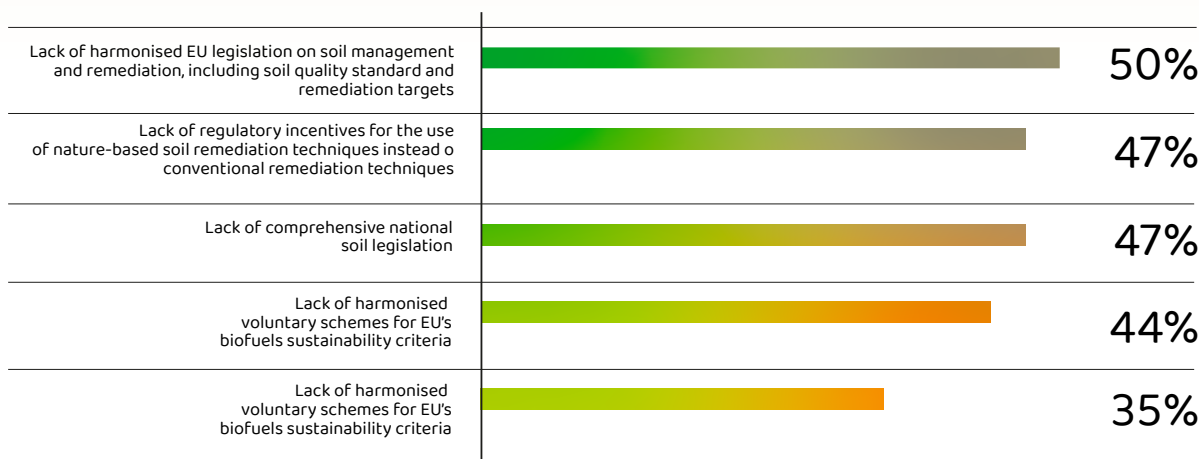
Major barrier: A remarkable legal roadblock that must be overcome in the short-term and requires pointed intervention by national and/or EU legislator.

Moderate barrier: A relevant legal issue that requires further attention as it could hamper the sound deployment of phytoremediation or production of advanced biofuels.

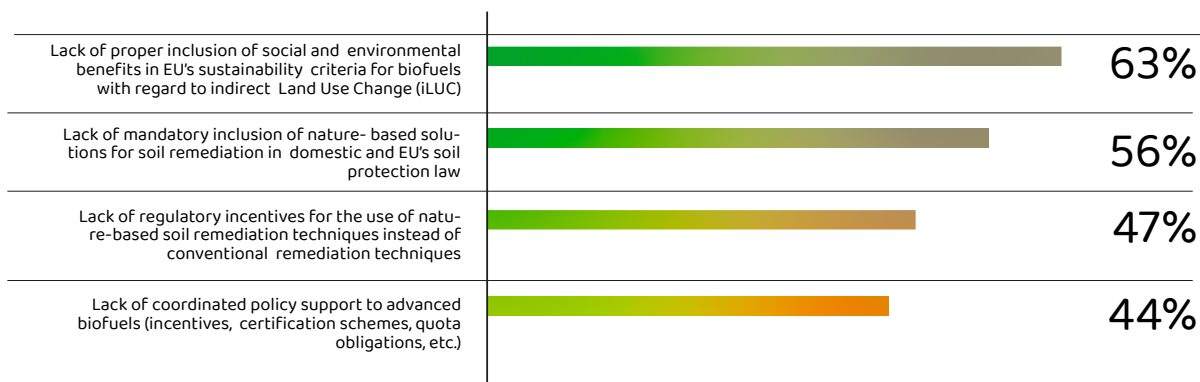
Minor barrier: A legal pitfall that nevertheless does not impinge on the viability of the value chain and can be overcome without far-reaching regulatory interventions.

Stakeholders rank (%)

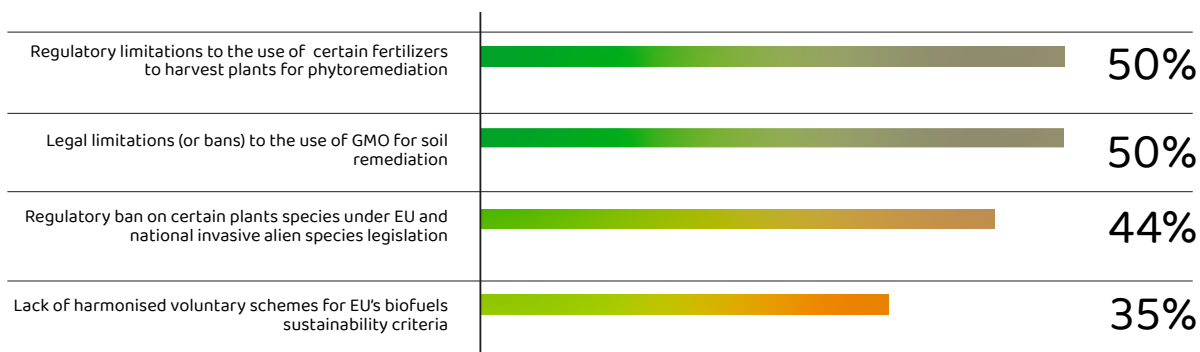
MAJOR BARRIER



MODERATE BARRIER



MINOR BARRIER



Within the above-mentioned areas of law that provide relevant legal framework for the Phy2Climate approach, we have pinpointed specific legal issues, which require further investigation and, eventually, a regulatory intervention at the EU and Member States domestic level. Overall, alongside specific enabling rules for phytoremediation uptake and mainstreaming of low-ILUC feedstock for biofuels deriving from contaminated sites, a more holistic approach is needed to address complex, yet inherently circular processes such as that at hand and developed by Phy2Climate.

STEP OF THE VALUE CHAIN	BARRIER
PHYTOREMEDIATION	
Adoption of phytoremediation	Lack of comprehensive soil legislation dealing with nature-based remediation techniques.
Crops selection	Limitations on imports of certain invasive alien species.
Crops yielding	Limitations to the use of certain fertilisers.
Crops selection Crops yielding	Limitations to the use of certain GMOs or NGTs for phytoremediation.
	Authorisation of certain substances under chemicals legislation (e.g., REACH in the EU).
Crops utilisation after phytoremediation	Classification of phytoremediation biomass as End-of-Waste or by-products according to waste legislation.
ADVANCED BIOFUELS PRODUCTION	
Feedstock supply	Lack of harmonised criteria for sustainable farming practices in relation to energy crops.
	Lack of comprehensive approach to carbon farming and inclusion of targeted promotion of restorative practices for increase of carbon stocks.
	Lack of dedicated regulatory schemes for non-food advanced biofuels.
Biomass conversion	Lack of comprehensive international standards and mandates for advanced biofuels for shipping and aviation.
Biomass conversion Distribution	Lack of financial support to advanced biofuels.
Distribution End-use	Lack of economic incentives to purchase of advanced biofuels.
	Lack of harmonised certification schemes for sustainability criteria of biofuels.
Biomass conversion Distribution End-use	Competing domestic financial support to petroleum fuels.

STEP OF THE VALUE CHAIN	OPPORTUNITIES
PHYTOREMEDIATION	
Adoption of phytoremediation	Comprehensive legal framework addressing nature-based soil remediation techniques.
	Financial support to phytoremediation pilots and techniques.
Crops yielding	Direct support to carbon farming for phytoremediation crops under agricultural policy.
Crops selection Crops yielding	Carve-outs and derogations to invasive alien species and GMOs legislation for crops used for soil remediation purposes.
Crops utilisation after phytoremediation	Coordination between soil policy and waste policy to enhance reuse of contaminated biomass resulting from phytoremediation.
	Calibration of End-of-Waste criteria for phytoremediation output materials.
ADVANCED BIOFUELS PRODUCTION	
Feedstock supply	Financial support to farmers for cultivation of non-food feedstock also for soil remediation.
Biomass conversion	Use of sustainability criteria for biofuels to include land degradation.
Biomass conversion Distribution	Dedicated support to the production of advanced biofuels.



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This factsheet has been elaborated based on the main findings contained in the Phy2Climate project Deliverable 6.1 – Catalogue of Regulatory Issues and Opportunities, delivered under the project's Work Package 6 - Phytoremediation and recovery of materials: regulatory & legal issues and opportunities in the legal system of the EU and of other selected countries, under the coordination of Hasselt University.

For further information, please contact:

Dr. Matteo Fermeglia – matteo.fermeglia@uhasselt.be

Mr. Marko Perišić – marko.perisic@uhasselt.be

The project consortium has put together 16 partners from 9 countries with long-term expertise in soil remediation, phytoremediation, biofuel technologies and energy processes, environmental and social sustainability, legislative analysis, communication and dissemination as well as business development for innovative technologies.



Phy2Climate is a H2020 project with title "A global approach for recovery of arable land through improved phytoremediation coupled with advanced liquid biofuel production and climate friendly copper smelting process

✉ info@phy2climate.eu

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