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Deliverable D8.1

Webpage operative

Lead Beneficiary	AXIA
Delivery Date	31 May 2019
Dissemination Level	PU
Version	1.0

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[1] PU = PUBLIC
PP = Restricted to other programme participants (including the Commission Services)
RE = Restricted to a group specified by the consortium (including the Commission Services)
CO = Confidential, only for members of the consortium (including the Commission Services)

Publishable Executive Summary

The GREENER project aims to accelerate the remediation of contaminated sites, for a range of organic and inorganic pollutants of high concern, while producing end-products, such as bioelectricity and/or harmless metabolites of industrial interest. To achieve such an ambitious goal, organisms with high bioremediation capacity will be identified and isolated. The influence of physico-chemical factors on the effectiveness of treatment will be evaluated and proof-of-concept experiments to define optimal integrated solutions at the lab-scale will be performed. Finally, a combination of the most promising technologies will be up-scaled and tested in the field. Life cycle analyses will demonstrate the technical and economic feasibility of the developed solutions.

GREENER is a multidisciplinary and research-intensive project involving 21 entities from 9 European countries and China (four Chinese International Partners) that proposes the development of green, sustainable, efficient, and low-cost solutions for soil/sediment and water bioremediation, integrating several innovative bio-electrochemical technologies.

The Deliverable D8.1 is a public report delivered in the context of WP8: Promotion and Exploitation of Results of GREENER Project. WP8 aims at the extensive dissemination, communication, and exploitation of results deriving from the GREENER project throughout Europe, China and beyond. This report presents the first step of the main objective of WP8, which is the project website and social media development in order to achieve widespread and high-quality access to project updates, results and related developments. Possibly the most far-reaching (in terms of geography and group diversity) dissemination tool is a webpage. Thus, a web-portal has been developed, which serves a dual purpose. On the one hand, project results are made public in a timely manner and are communicated to a wide audience and on the other hand, project partners can acquire and share confidential information related to the project. The publicly accessible areas of the webpage include basic information about the GREENER project, such as the scope and the work plan towards reaching the project's objectives, and their expected impacts. In addition, the consortium team is presented with detailed information about their role. Furthermore, viewers have the option to read about news and events related to the project, receive the newsletter and contact the project coordinator. The partner's area of the website is accessible only by entering a valid username and password. Project partners will be asked to create a profile on

the webpage, which will need to be approved by the webpage administrator before the user gains access to the secure area.

Through dissemination activities, technological advancements are communicated to potential investors, customers, and end-users. The dissemination activities are therefore critical for achieving the desired project impact and their success depends on the extent as well as the form of the material. Partners participating in dissemination activities are able to enter details of these activities in a matrix that is available online.

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1. Introduction

The website is the project's showcase and aims to increase public awareness of the project by providing visual and easy to comprehend information about the GREENER concept. Its structure comprises of the following sections: Home, About, Greener's core, Our team, News, Technology watch, Download center, Contact. The site itself is split into two sections: private and public. The public section, which is accessible to everyone, contains general information about the objectives of the project, partners' details, list of news and events, all public material that will be generated by the project, links to social network profiles, newsletter subscription, contact information. The second part of the website is a private section that is available to the GREENER partners. The private section can be accessed via log-in credentials. This restricted area will contain deliverables, reports, information about meetings, templates and editable dissemination material.

The project website (www.greener-h2020.eu) is the primary information source for the targeted audiences. The purpose of the website is to promote the project and its results to the environmental relevant sectors, the wider public, academia, policy makers and stakeholders, even beyond the project's own community. The specific goals are summarised below:

a. To raise awareness about the scope of the project, its objectives and its results,

b. To promote the innovative, low-cost, efficient and sustainable solutions for effective environmental remediation to relevant stakeholders,

c. To build understanding and facilitate adoption of project results,

d. To assure that all interested parties are involved, participate and are informed about the status of the project.

The projects target audiences are:

- Specialised audience (scientific and technical);
- general public;

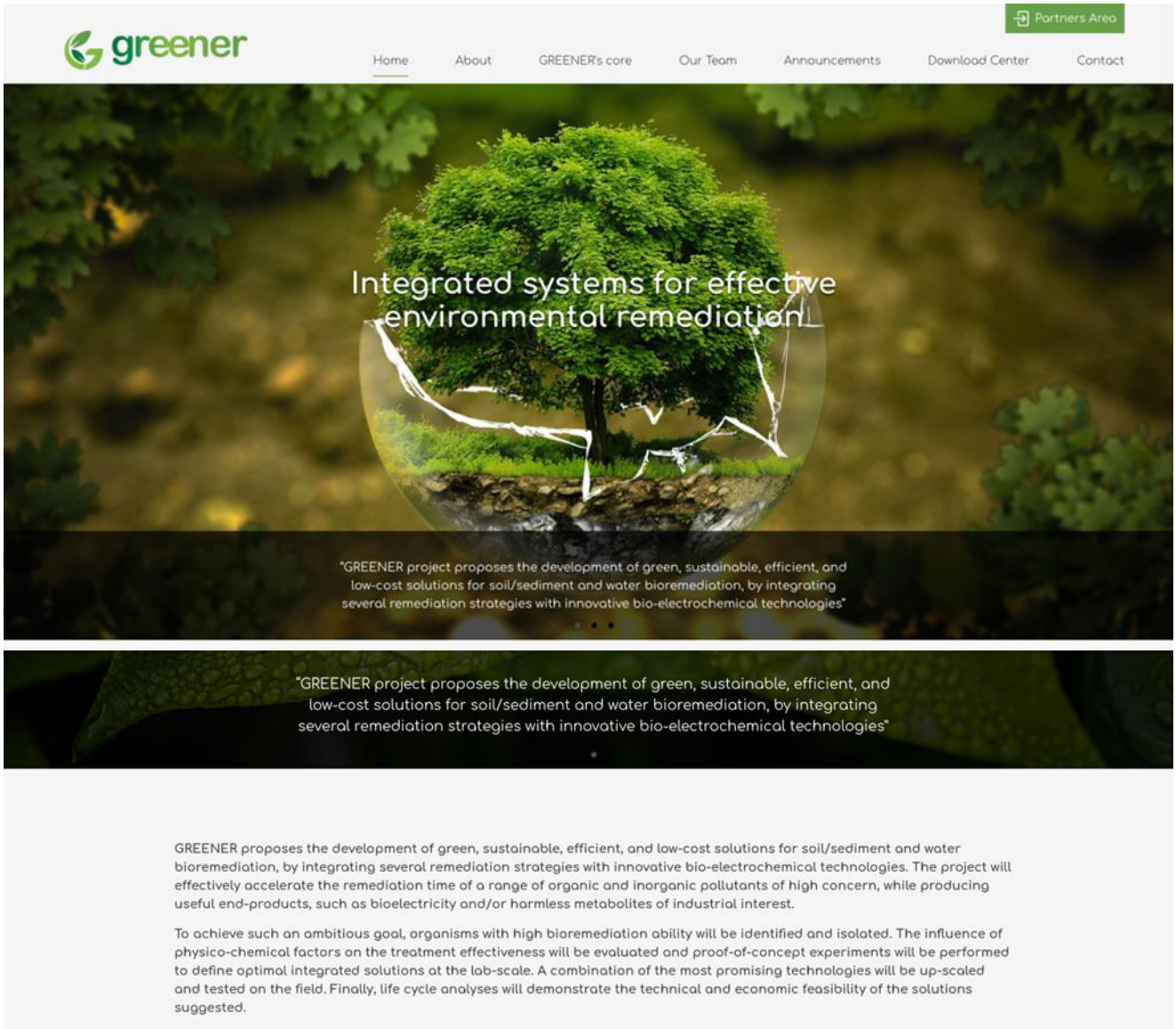
- engineers; chemists, bioelectrochemists, biochemists; biologists, microbiologists, microbial ecologists; researchers in general;
- civil and water engineering services companies;
- universities and research institutes;
- technology industry;
- regulatory bodies;
- stakeholders from value chain;
- wastewater and waste management;
- policy makers,
- community associations;
- technology providers for bioremediation;
- R&I or innovation related initiatives within the BIOTEC projects or from National funding in order to create impact;
- Contaminant recovery interested in, for a circular economy (e.g. metals);
- Industry groups (contaminated places, agricultural activities, oil and gas industry, chemical and pharmaceutical industry, environmental sector)

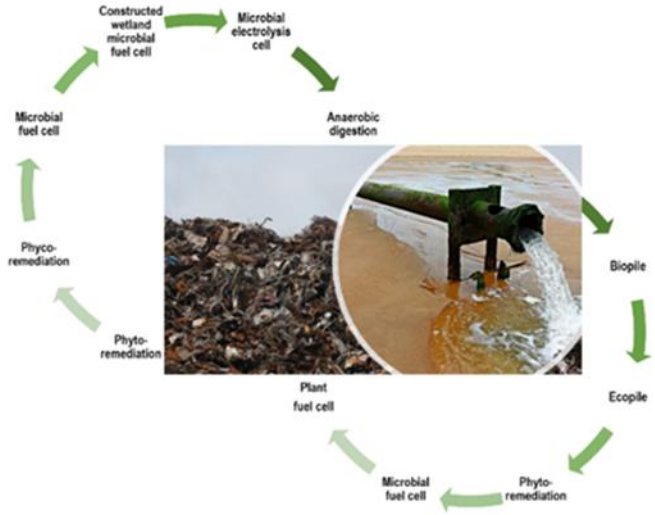
In addition to the webpage, information about the project and related activities are made public through social media. Project platforms in LinkedIn, Facebook, and Twitter. Social media facilitate access to information for large audiences from diverse backgrounds. Evaluation of the webpage and social media performance will be made using performance metrics such as number of visitors, followers, and public interaction.

2. Website structure

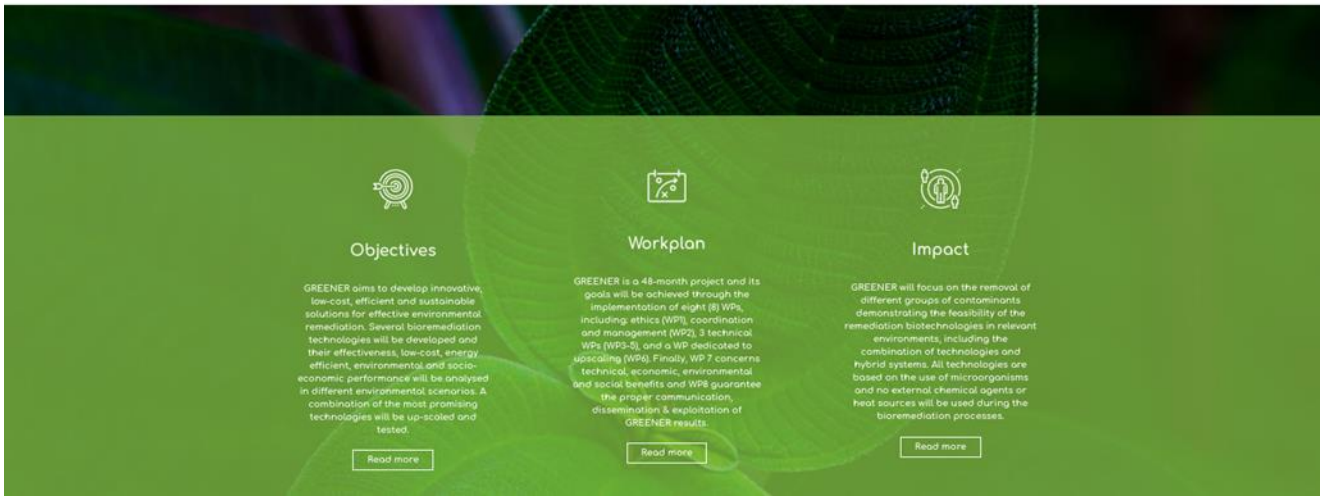
2.1 Home

The Home page provides basic information about the project. The upper part of the screen shows a navigation panel, using a structure that is commonly used. At the top of the page the project's logo can be found, while at the bottom of the page newsletter subscription, contact, projects details, EU collaboration and links for the social profiles are shown.





GREENER innovations as new biotechnologies for environmental remediation



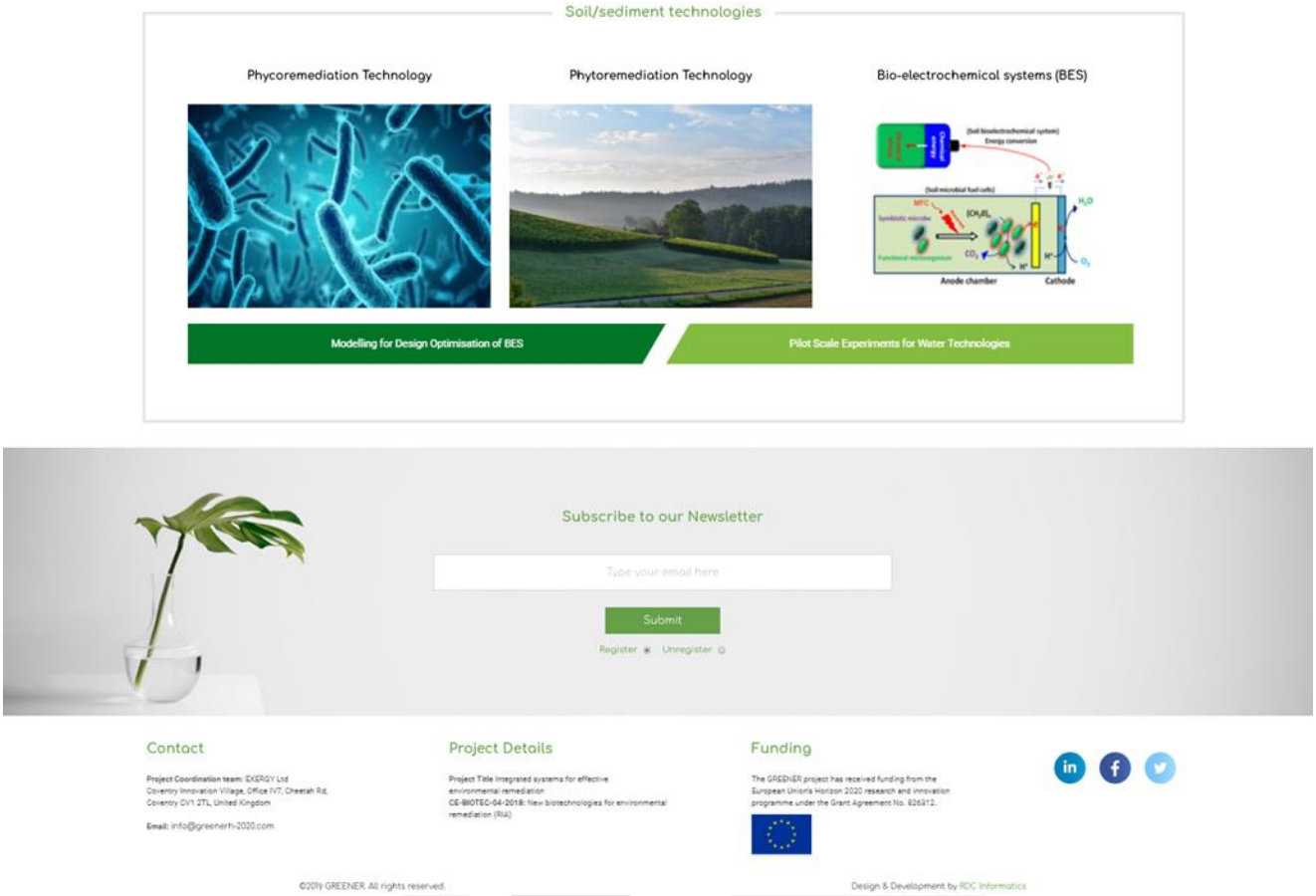


Figure 1. GREENER website homepage

2.2 About

A more detailed description of the project is given while information is also given regarding the GREENER project's objectives, workplan and impacts.

2.2.1 Objectives

The projects objectives are displayed here in a short text that outlines the major expected achievements of the project.

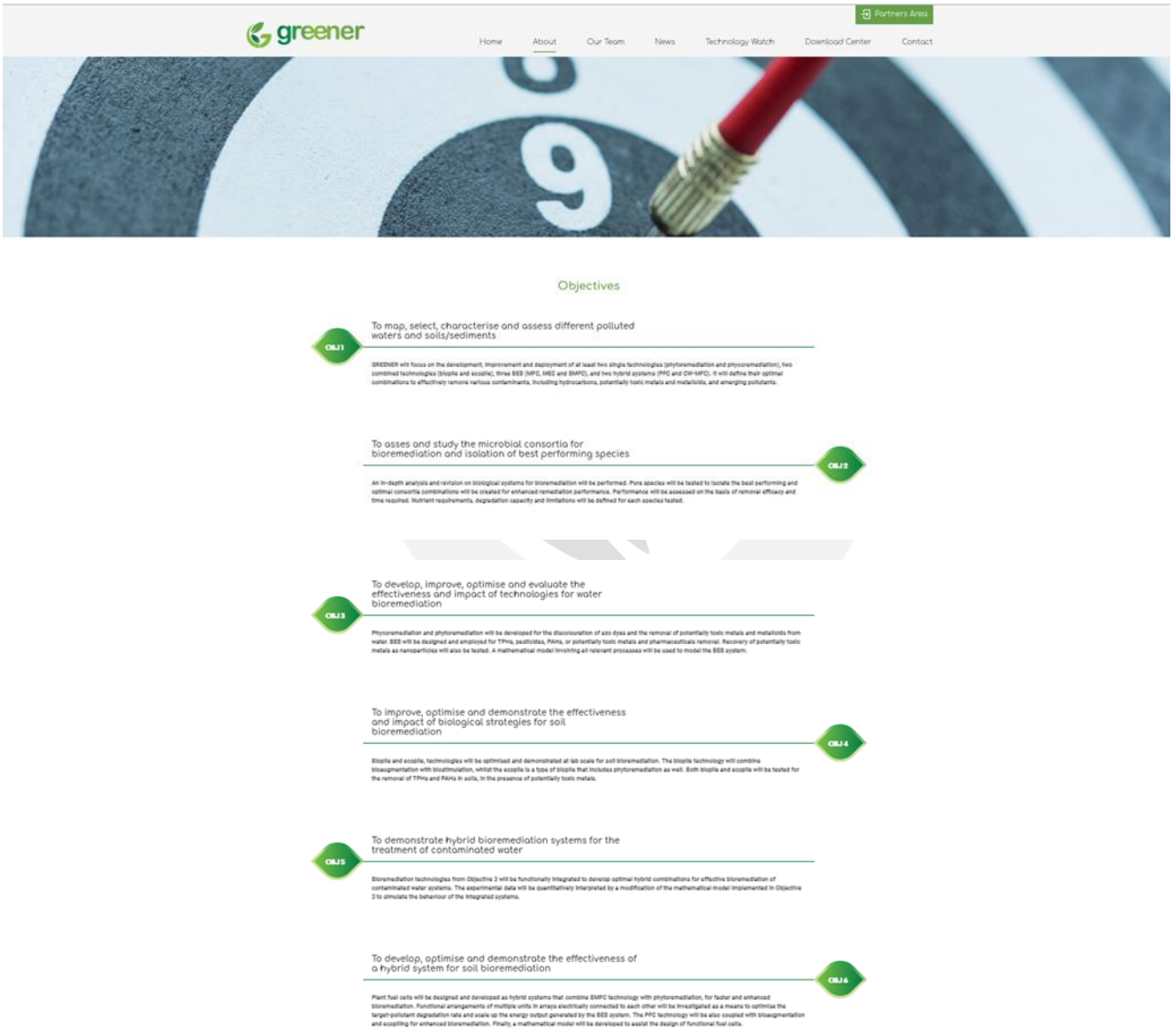
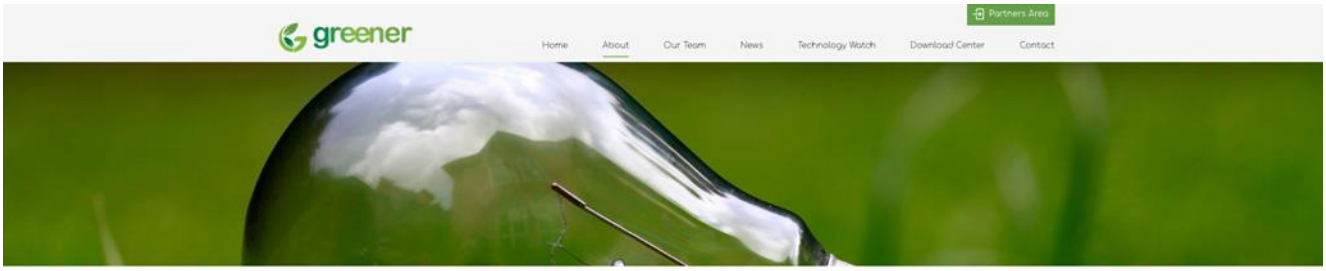


Figure 2. Objectives

2.2.2 Workplan

A short list of the projects work packages is presented here. At this stage, the information provided is limited, in order to avoid disclosing proprietary information. More information will become public as the project progresses.



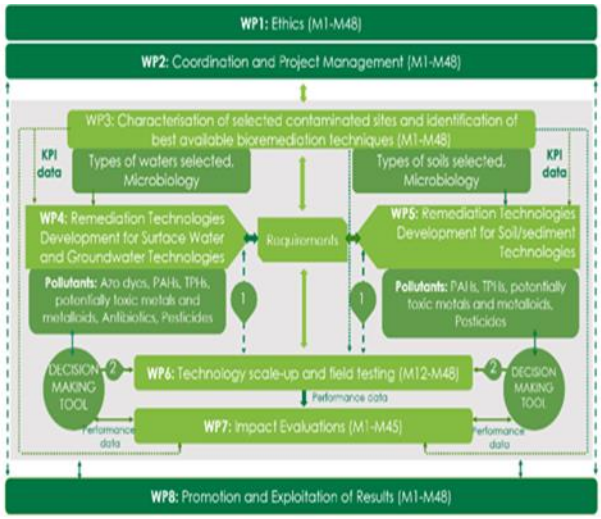


Figure 3. Workplan

2.2.3 Impacts

A brief presentation of the expected impacts of the project is shown in this section.

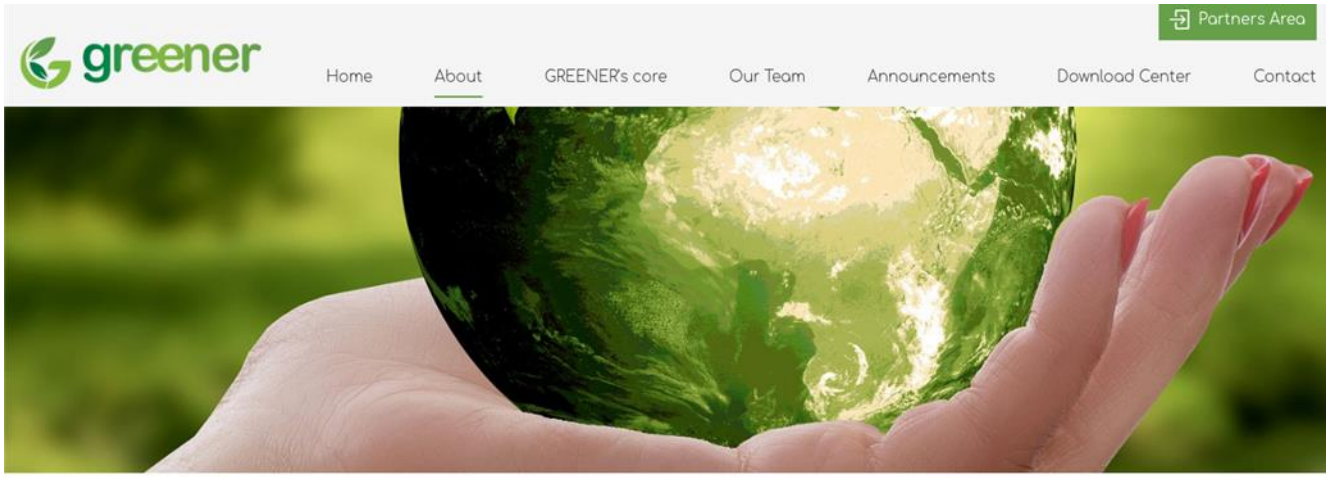


Figure 4. Impact

2.3 Greener' s core

2.3.1 Contaminated sites

In this section the selected contaminated sites are presented, for both polluted soil and contaminated water.

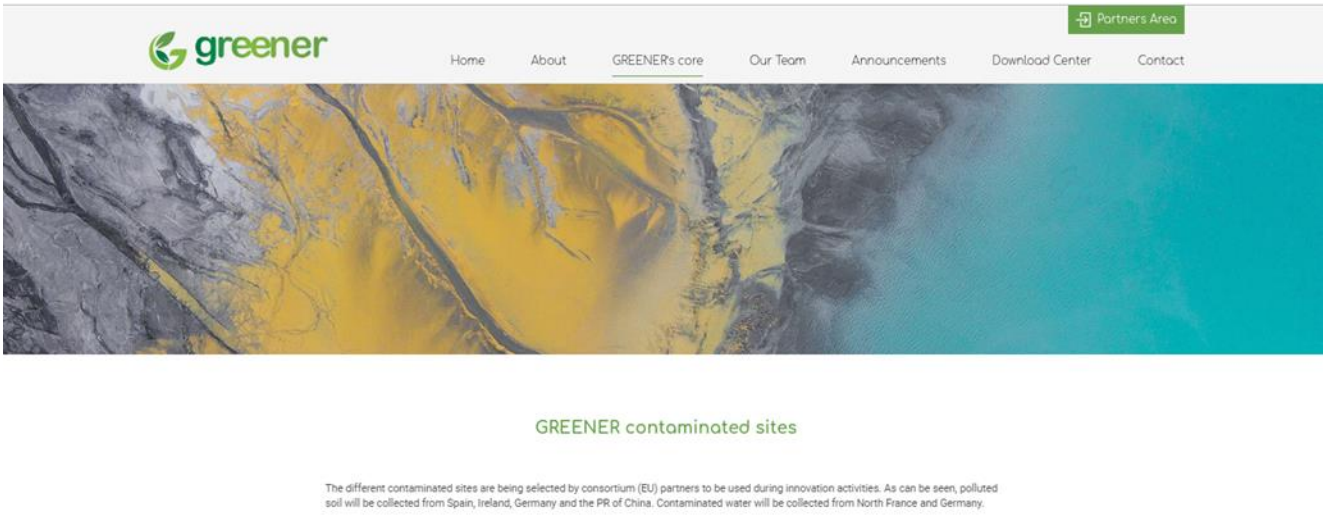
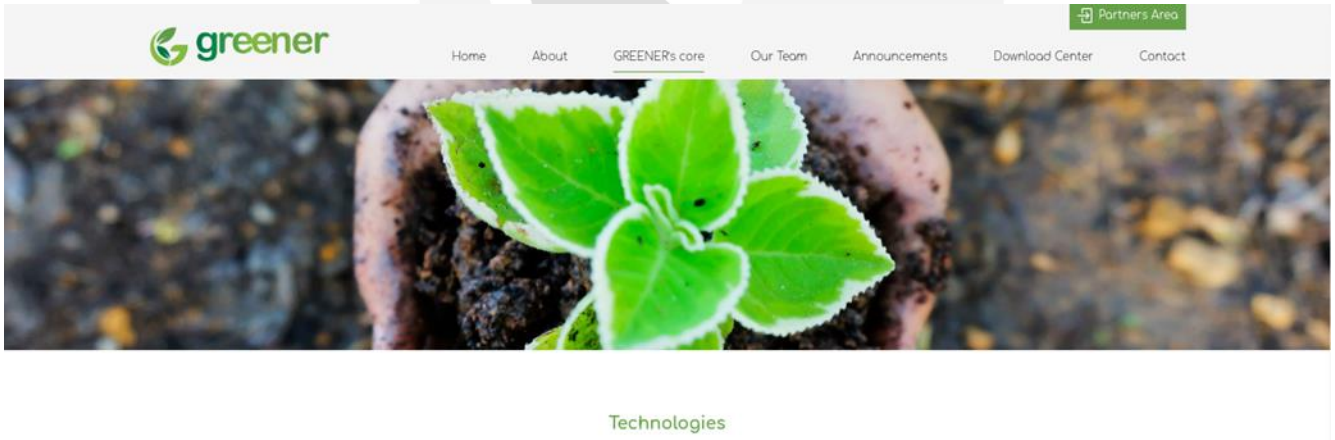


Figure 5. Contaminated sites

2.3.2 Technologies

The remediation technologies development for surface water and groundwater presented in this section followed by the remediation technologies development for soil/sediments.



Phycoremediation Technology

Phycoremediation is the use of either macro-algae or micro-algae for removal or biotransformation of different pollutants & nutrients like organic/inorganic carbon, Nitrogen, Phosphorous, sulfates, heavy Metals etc. During Phycoremediation process, micro algae use carbon, nitrogen, phosphorus & other salts from the waste water which act as nutrients for them. In GREENER, the consortium focuses on the improvement of **azo dyes removal** using microalgae (e.g. Chlorella pyrenoidosa, Chlorella vulgaris, Cosmarium sp., etc.). This will be achieved by using bioreactors (with controlled conditions) for axenic cultivation of different microalgae for testing toxicity of azo dyes. The effectiveness of azo dyes biodegradation and possible production of toxic aromatic amines will be then tested. Special attention will be paid on the toxicity assessment of the resulting biodegradation products, including aromatic amines produced during degradation of azo dyes.

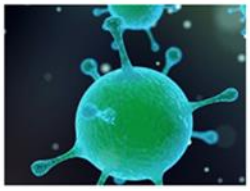
Phytoremediation Technology

The use of plants through phytoremediation technology is an alternative solution to treat **heavy metal contaminated areas**. Several plants have been proposed for heavy metals remediation. Each plant has different responses to different heavy metals exposure. Some plants are sensitive to several heavy metals while others have a high tolerance and can maintain growth and development. In GREENER, the reinforcement of phytostabilisation will be studied on the basis of preliminary screening of plants, in order to promote the absorption (phytoextraction), utilization and accumulation of nutrients, and to increase the tolerance of plants to environmental stress.
Local plant species with hyperaccumulator properties and plant cultivation on the adsorption of potentially toxic metals and metalloids (Pb, Zn, Cd and Cu) will be studied. Moreover, the joint action mechanism of plant probiotics with plants in water remediation will be investigated. The effect of the plant growth regulators, chelating agents, antibiotics and other substances secreted by microorganisms on plant environment adaptation ability will be studied. The optimized plants and strengthen measures will be selected, while characterisation of metal resistant/tolerant bacterial strains, evaluation of selected bacterial/plant combinations and their response to heavy metal challenge will be investigated.

Bio-electrochemical systems (BES) applied for water pollution

Globally, billions of euros are spent treating trillions of litres of wastewater every year, consuming substantial amounts of energy. However, this wastewater could act as a renewable resource, saving significant quantities of energy and money, as it contains organic pollutants which can be used to produce electricity, hydrogen and high-value chemicals, such as caustic soda. This can be achieved if the organic matter is broken down by electrically-active bacteria in an electrochemical cell, which, at the same time, helps clean up the wastewater. Examples of such 'bioelectrochemical systems' (BES) are microbial fuel cells (MFCs) and microbial electrolysis cells (MECs). Novel systems for groundwater and wastewater remediation based on BES reactors will be developed under the GREENER project. This approach will lead to an enhancement on existing remediation technologies for target pollutants (including **TPHs, PAHs, antibiotics, potentially toxic metals and metalloids and pesticides**). The system will be monitored and analysed to determine the best operational conditions for enhancing pollutant removal and energy output. Moreover, a **mathematical model of the system** will be developed: the model will combine equations of bio-electrochemical and electrochemical reactions, transport phenomena, and current distribution, with electric conduction within the biofilm.

Development of novel technology for metal removal and recovery of nanoparticles from the biological systems



Depending on the metallic contamination to be tackled, different bacterial strains or consortia of bacteria will be employed. Microbial communities will be subjected to feedstocks containing diverse metal ions at different concentrations. Tests will be performed and optimised in common reactors. Recovery efficiency of metals as nanoparticles will be determined by physical-chemical techniques as well as electron microscope techniques. Finally, long-term performance will be studied and optimized.

Integration of BES in hybrid technologies for contaminated water technologies

Hybrid systems combining BES reactors with phytoremediation will be developed, for the removal of pesticides, TPHs, metals and antibiotics. Integrated systems will be designed for the treatment of leachates from conventional bioremediation processes such as anaerobic digestion, generally rich in metal ions, volatile fatty acids, and residues of antibiotics and bioactive molecules. Biofilm activity will be evaluated by measurement of the electrochemical performance of the system, and monitoring of its physico-chemical parameters, using the efficiency of bioconversion or bioremediation as the optimization parameter.

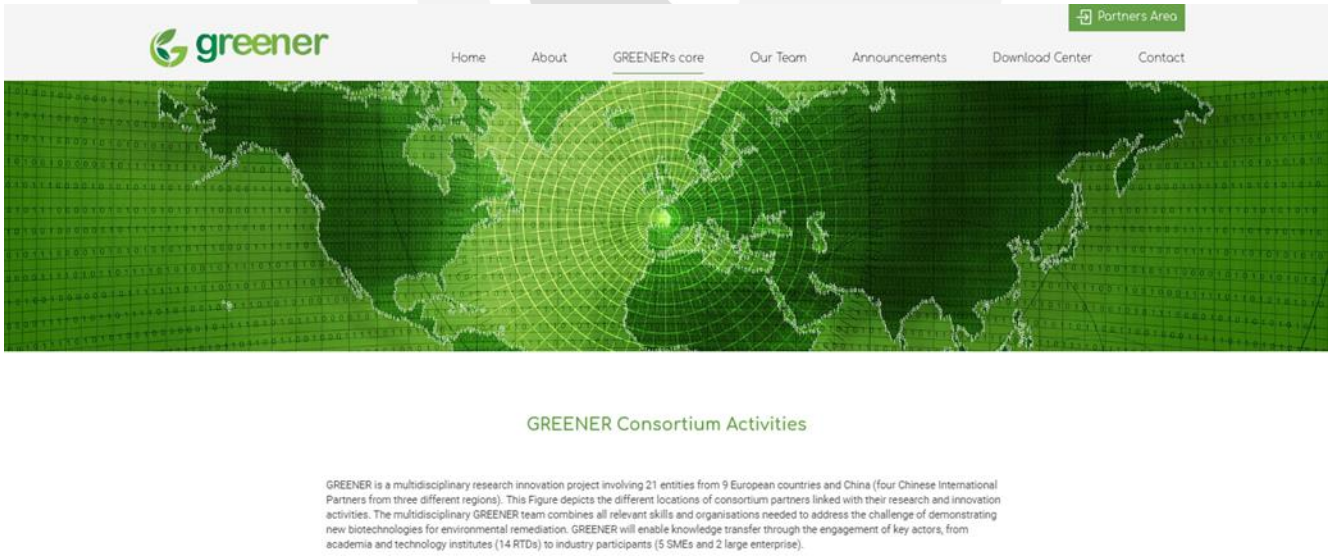
Pilot Scale Experiments for Water Technologies

Guidelines for scaling-up the above mentioned technologies will be established. All the information resulting from previous tasks will be gathered in order to establish a successful strategy. Moreover, technologies developed will be validated in a relevant environment. For this purpose, different reactors (one technology for partner) will be scaled-up from mL to liter scale (in the range of 5 to 100 liters). Pollution abatement at pilot scale will be undertaken using real contaminated samples. These pilot scale experiments will serve as input for the GREENER decision-making tool. The outputs from the pilot scale experiments will define the guidelines for successful field test experiments.

Figure 6. Technologies

2.3.3 Consortium Activities

This tab includes the activities that the consortium has undertaken, including the demo sites that will be tested during the GREENER project.



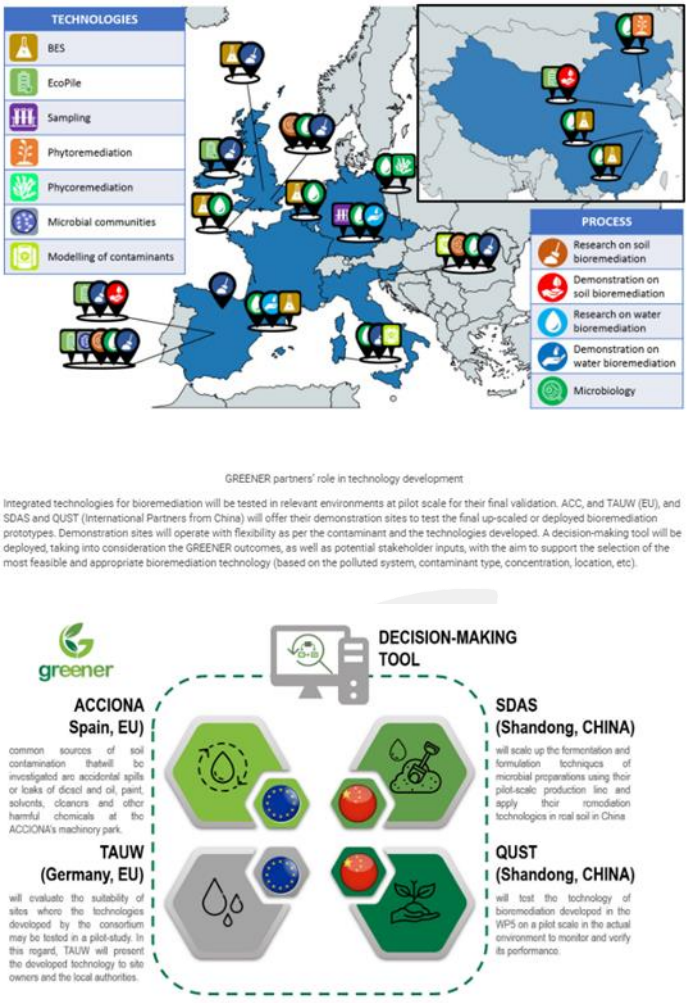


Figure 7. Consortium Activities

2.4 Our team

2.4.1 Management

A description of the responsibilities of the Project Coordinator, Financial Manager, Scientific and Technical Manager, Innovation Manager and Dissemination Manager are presented in Fig. 8.

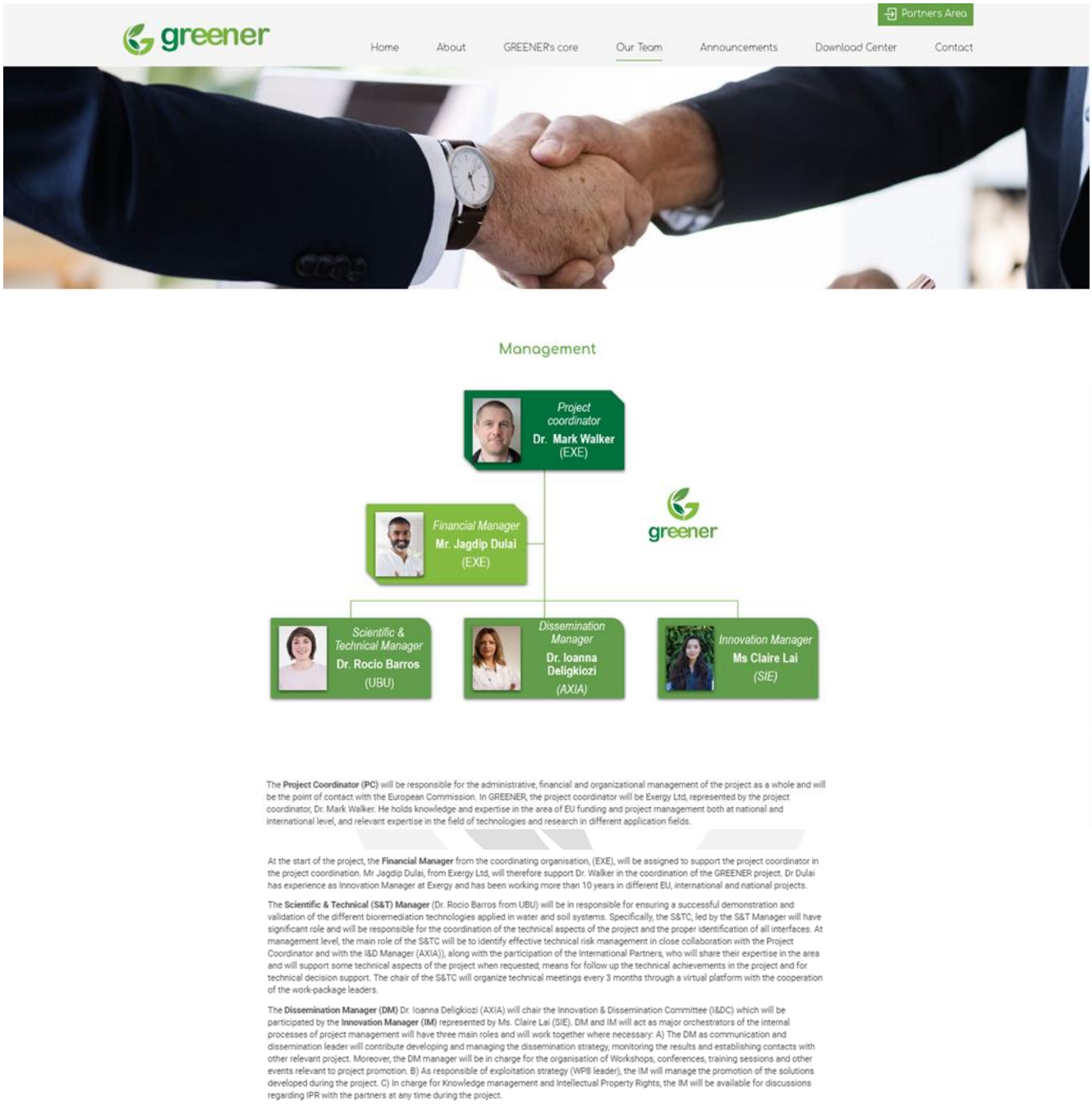
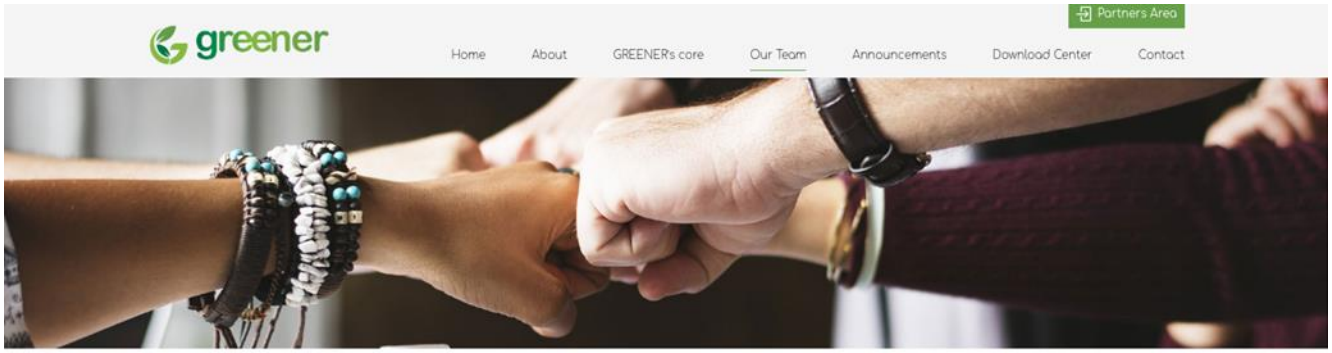


Figure 8. Management structure

2.4.2 Partners

Detailed information is given regarding the consortium partners. The partners logos and a link to their website is available, as well as a description of their role in the project.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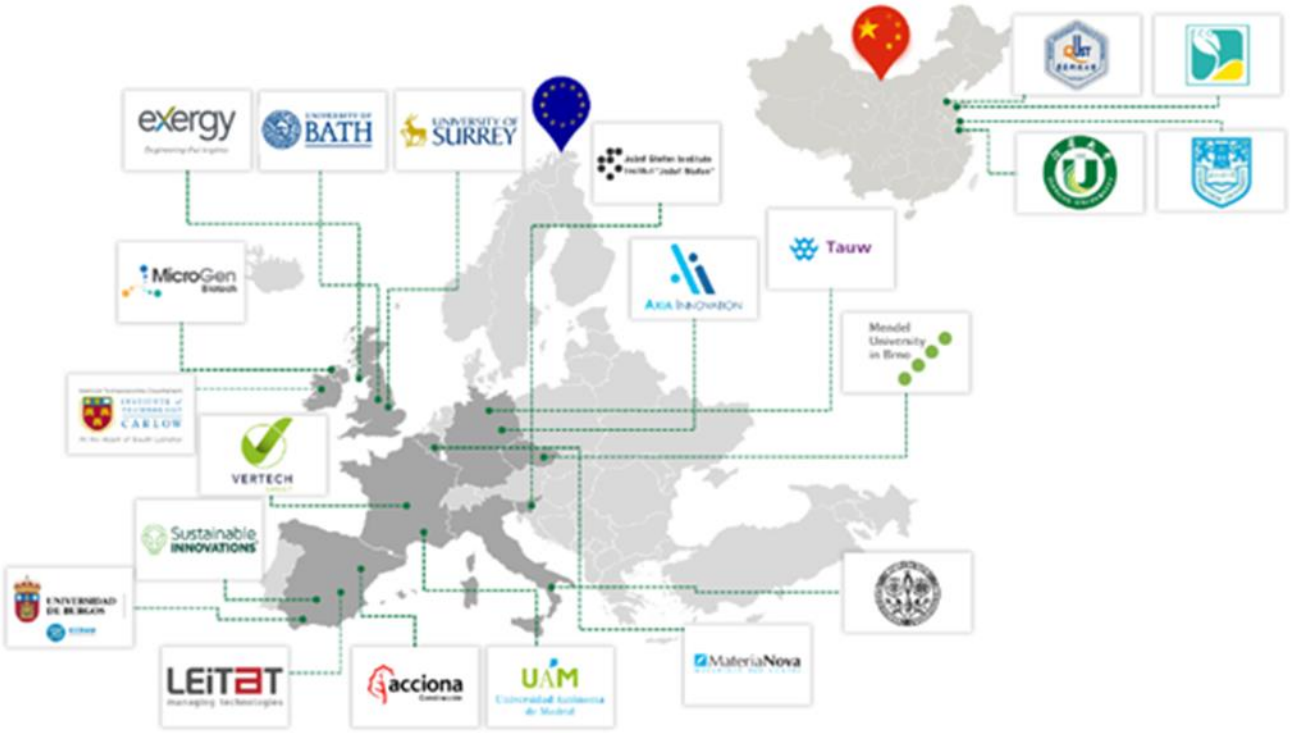
Partners Area
Home
About
GREENER's core
Our Team
Announcements
Download Center
Contact

Partners


exergy
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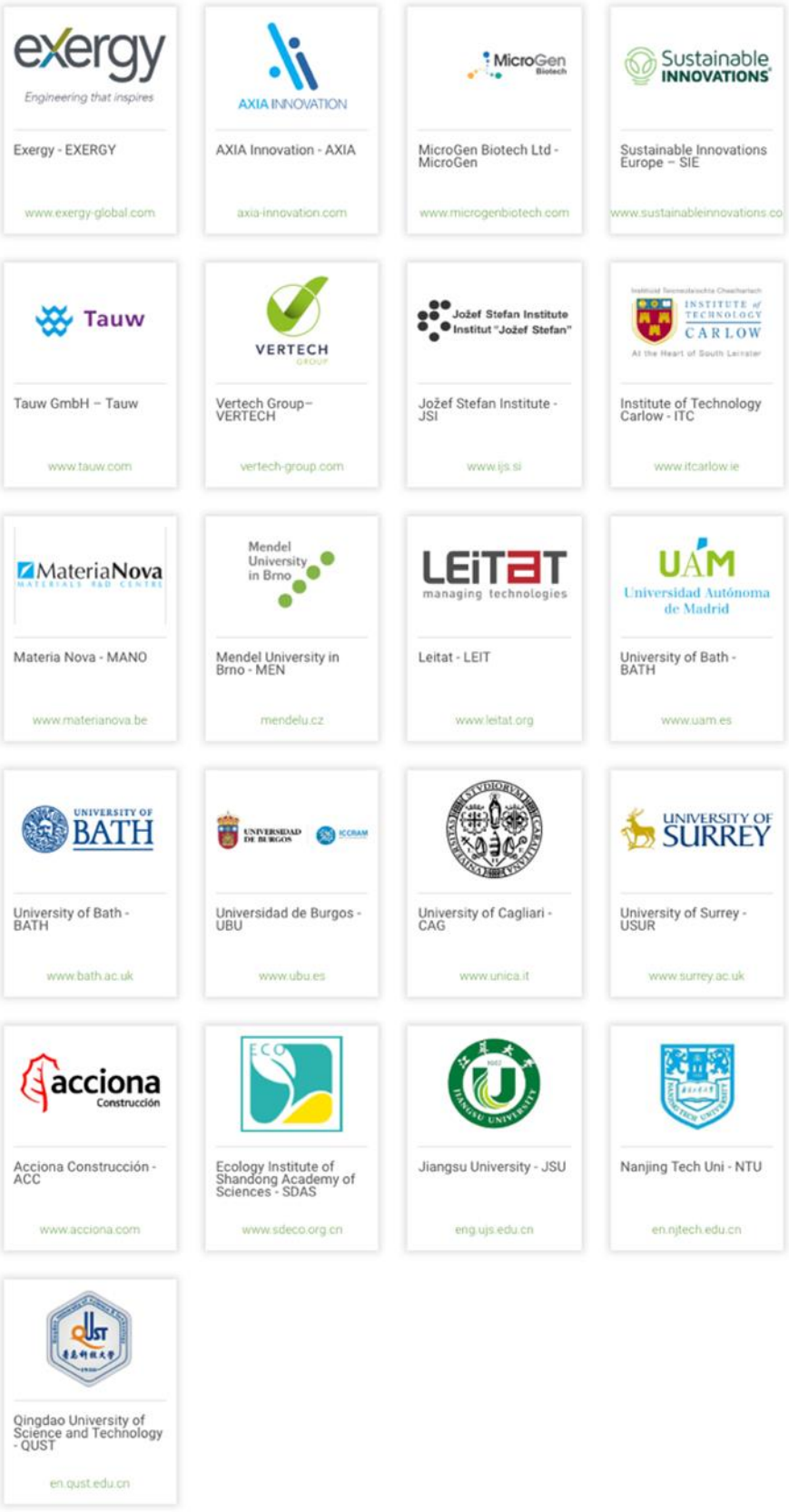


Figure 9. GREENER Partners

2.5 News

This page will present a list of news and events that will include all meetings of the project partners and important events in which a large group of the consortium partners participate, such as conferences, fairs, workshops, trainings etc. Details about upcoming events and summaries of past events will be made public in this section. This section will be constantly updated during the project.

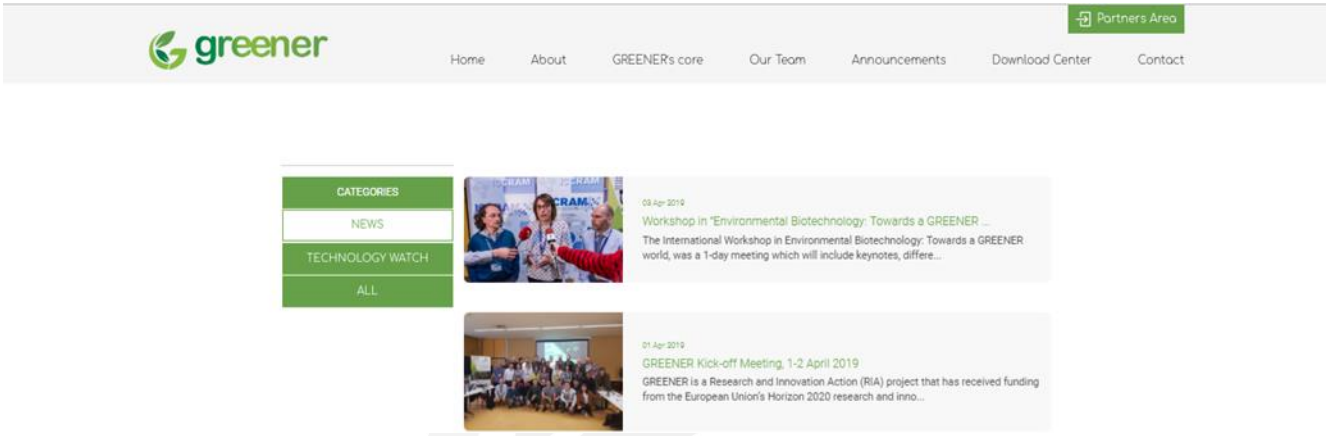


Figure 10. News

2.6 Technology watch

Publications in peer-reviewed scientific journals and important links from other parallel R&D activities can be found in this page.

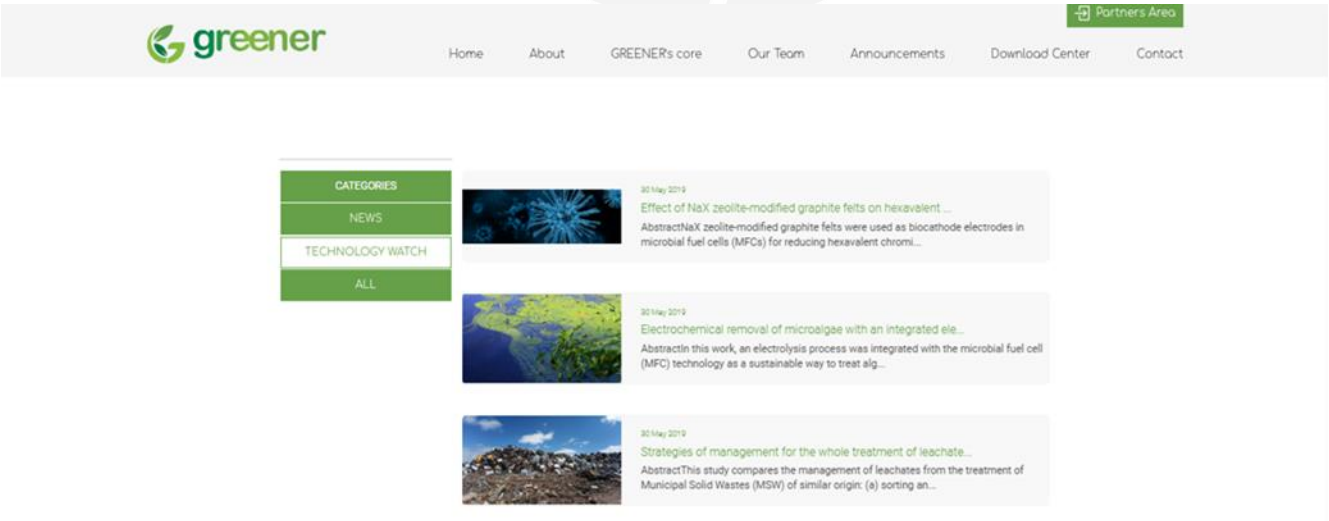


Figure 11. Technology watch

2.7 Download center

Every visitor of the website has access to the project's public documents regarding dissemination activities and official results. In particular, this section will include dissemination material (brochures, presentation templates, roll ups, posters etc.), public deliverables, publications deriving from the project results and a photo gallery including photos from consortium meetings and events. The content will be constantly updated in order to include the newest information from the consortium.

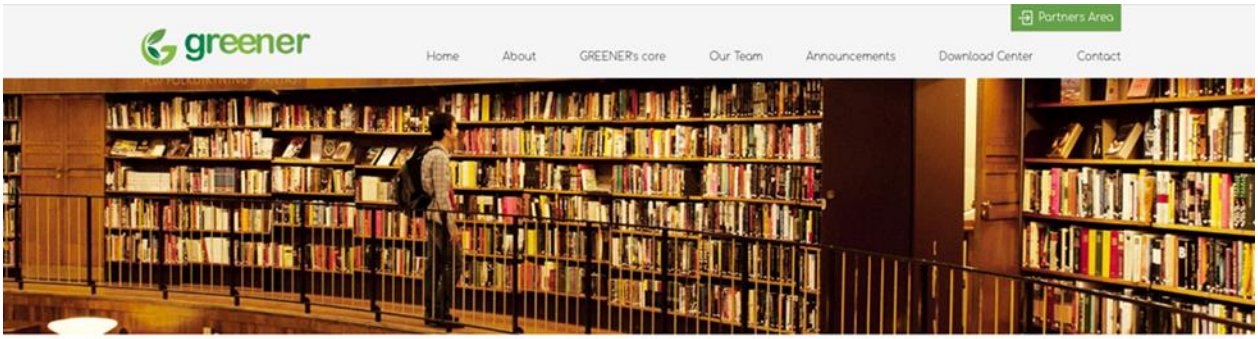


Figure 12. Dissemination material

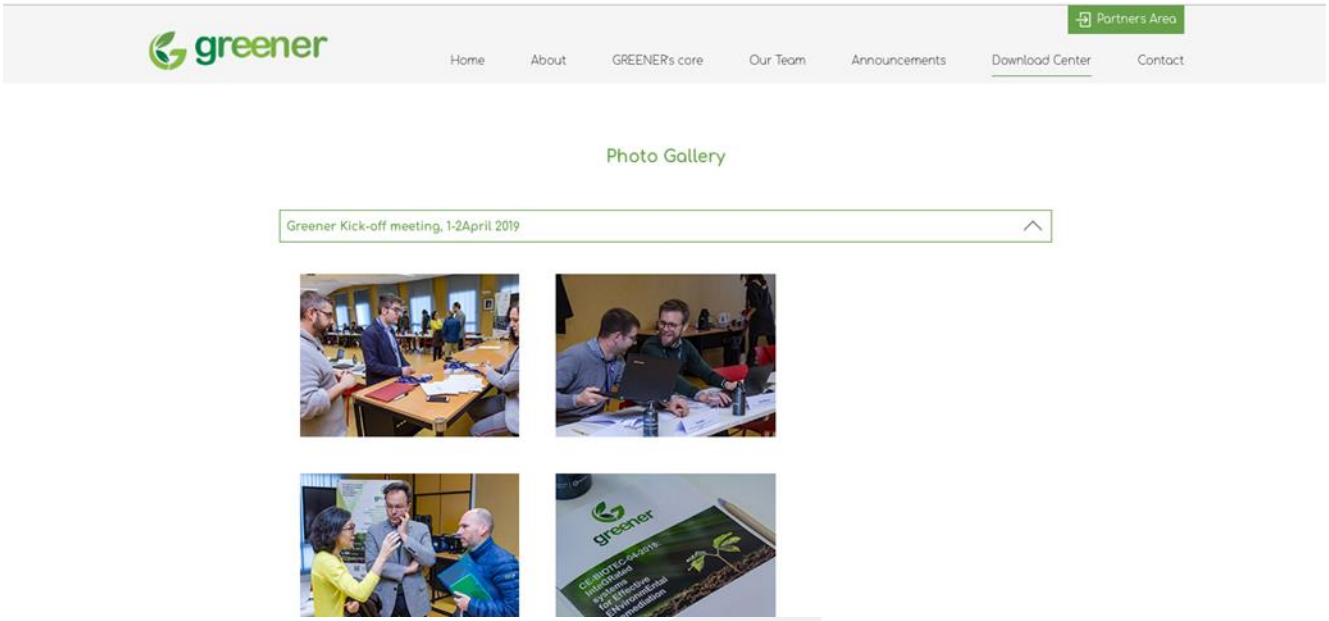
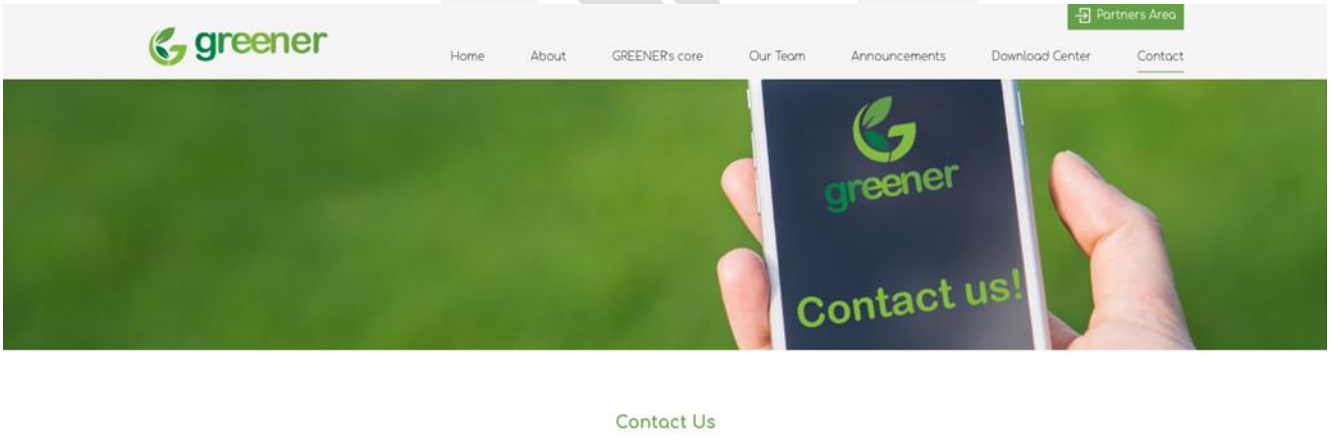


Figure 13. Photo gallery

2.8 Contact

A contact form for communication with the coordination team as well as contact details are given in this page. A map represents the locations of each partner of the consortium.



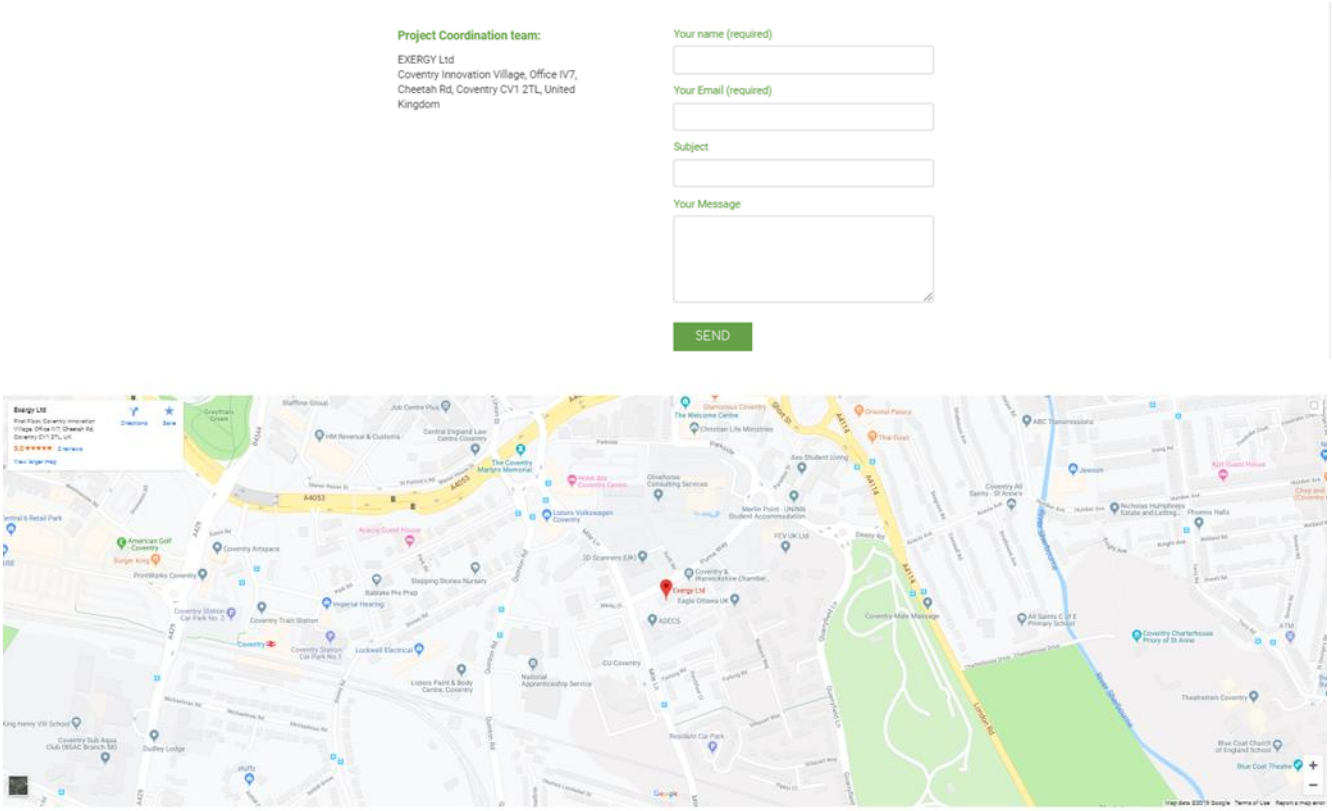


Figure 14. Contact

2.9 Partners Area

Partners area is an area accessible only by authorized users and designed specifically to facilitate communication within the consortium. The GREENER private area was designed and set up using the MELO SOFTWARE PLATFORM. The GREENER private area is dedicated to data sharing and project management, including reporting and information which is not available to the general public. Each partner is provided with a username and password in order to validate their access to the secure area. Full access could be also granted to the European Commission Officer, if necessary at any time. Project partners will be able to use the private area for sharing project related information. An option to login will be available on the website for that purpose. Partners should send their request to create an account, which will be granted by the webpage administrator. Followingly, partners will be able to login and access the restricted area of the webpage, where they will be able to upload documents not exceeding a certain size limit.

Folders in the private area are organized with a Windows Style graphical user interface, with the most common actions available on the toolbar. Each work package has a dedicated folder where participants

can share information and documents related to their tasks including drafts of the deliverables, scientific articles, reports, etc. Project partners also have access to the General Section where the project logo and information on meetings (including minutes of meetings, presentation, agendas and pictures) are available. Moreover, a Dissemination and Communication Kit Section includes dissemination material, such as flyers, posters, presentation and deliverable templates, roll-ups, etc. Finally, all the project members have access to the Administrative Section with legal documentation such as the Grant Agreement, and its annexes, Consortium Agreement, mailing list and templates for project reporting are included.

3. Social media platforms

In addition to the webpage, three social media platforms have been developed for the GREENER project, these are Facebook, Twitter, and LinkedIn. These media have been selected to maximize dissemination/communication of the project results to a wide public audience, such as professionals whose work is related to the environmental and bioremediation sector as well the wider public that may be interested in obtaining information about current technological and scientific projects.

Project partners are encouraged to visit these links and communicate them to their professional and private networks. Access to the social media is also supported on the project webpage. Evaluation of the accessibility and efficiency of these social media platforms to disseminate information and engage the public will be made on the basis of performance metrics, such as number of visits, followers, comments, etc.

3.1 LinkedIn Profile

Link: https://www.linkedin.com/company/greener-h2020-project/

LinkedIn is promoted as a professional network platform. The GREENER LinkedIn profile has been created to disseminate the project results to professionals through creating a network of connections from environmental sector, academia, the media, the general public, as well as investors and relevant stakeholders.

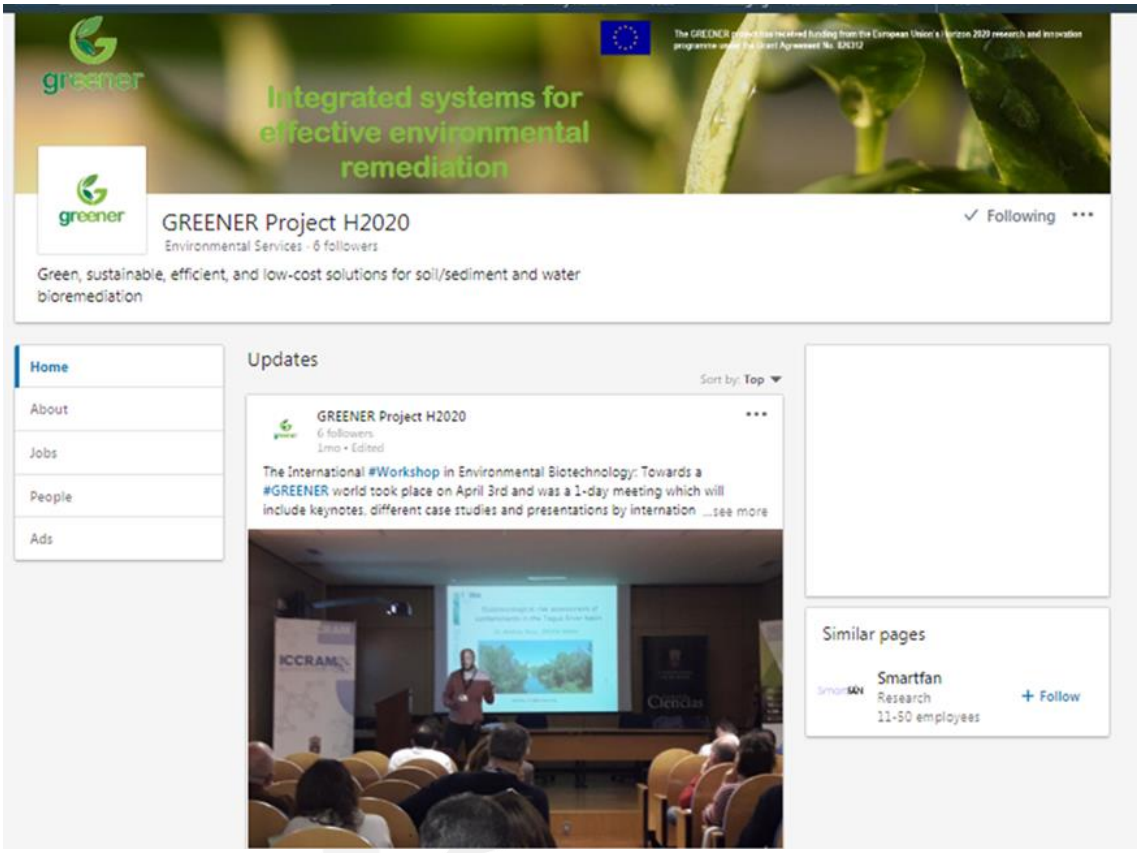


Figure 15. GREENER LinkedIn page

3.2 Facebook Profile

Link: https://www.facebook.com/GreenerProject/

Facebook is the most popular social network and has been developed. The GREENER profile on Facebook targets the wider public that is interested in technological advancements, and research of environmental sector, bioremediation technologies, etc.

Figure 16. GREENER Facebook page

3.3 Twitter Profile

Link: https://twitter.com/GreenerH2020

Twitter is an online news and social networking service, where short news are made public to a wide range of subscribers and from a variety of backgrounds. Followers of the GREENER Twitter account will be able read posts of GREENER activities and interact with messages.

Figure 17. GREENER Twitter page

4. Future work

Future work will include improvements of the website and addition of technical and visual material that will be updated frequently by the consortium partners. The website was created and will be maintained by AXIA Innovation. Monitoring of the website statistics will include the mapping of new visitors, return visitors, languages used, and countries.. The website, social media, and dissemination plan will be update based on project progress monthly and/or whenever necessary. To this end a dissemination questionnaire is already developed and distributed among the partners, aiming to collect monthly valuable information from the GREENER consortium on publication, dissemination activities (attendance to events, workshops, etc.) and possible upcoming events that might be of interest for the involved partners.

5. Conclusions

The GREENER website is a key element of the project's dissemination strategy. This site will ensure the visibility of the project, facilitate the dissemination of the project's results and promote their exploitation. Moreover, the project Social networks presence is ensured through the creation a facebook page, as well as a linkedin and a twitter account. The project website and its social media will continuously form and develop as the project itself grows.