1. Project Description

The GeniusFuels project tackles key scientific and technological current challenges to produce fuels for maritime and heavy-duty transport (e.g., methanol and/or dimethyl ether) and biochar. The GeniusFuels project want to provide groundbreaking solutions by combining high temperature solid oxide electrolysis (SOEC) with a biomass gasification process, taking advantage of the oxygen coproduced in the electrolysis as an alternative to conventional air separation units that entail a high cost to avoid the dilution of the produced syngas with N_2. A fraction of the electrolytic oxygen will be used to upgrade the gas after the gasification with a catalytic reforming process, increasing the syngas quality and the process temperature; the resulting waste heat can be favourably provided to the SOEC to reduce its operative costs. Furthermore, two processes for the production of MeOH and DME will be tailored in response to the $H_2/CO/CO_2$ ratio in the syngas produced by the gasification/reforming and to the effect of pollutants, by studying the reaction kinetics in detail". Finally, the biochar, usually coproduced with a 10-20 % yield, can be a valuable product to store carbon and produce negative CO_2 emission fuels.

2. Project Objectives

The project aims at developing a sustainable, efficient and cost-effective process for the production of renewable fuels to decarbonize the hard to abate heavy and long-distance transport by combining electrolysis and biomass gasification. More in detail, the projects provides a groundbreaking solution by combining an enhanced high temperature solid oxide electrolysis (SOEC) process to a biomass gasification process, exploiting the oxygen co-produced by the electrolyser as an alternative oxidant to air or pure oxygen produced by expensive air separation units. The hydrogen produced by electrolysis is used to increase the H_2/CO ratio at the exit of the gasifier, avoiding the need for a water gas shift reaction (WGSR) step and maximising the overall efficiency of carbon conversion to fuel. The use of oxygen/steam in gasification will be implemented on a highly flexible gasifier with the unique feature of a two feed system able to modulate the amount of low and high humid biomasses. The upgrading of the resulting gases will also use oxygen/steam mixture and will be implemented thanks to the development of an innovative system based on multistep oxy-reforming of tar and hydrocarbons inside a gasifier. This process allows to increase the quality and yields of the syngas and to increase the temperature of the exit gas up to 900°C. This gas can be used to heat up the steam and the sweep gas fed to the SOEC, thus reducing its balance of plant (BOP) CAPEX and OPEX cost. The project aimed at developing the whole value chain exploiting the synergies therefore the so-obtained syngas is cleaned from pollutants at moderate temperature, combined with the H_2 produced by electrolysis and then converted to renewable fuels. Two processes will be developed dedicated to MeOH and DME will be

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developed with focus on effect on $H_2/CO/CO_2$ ratio on kinetics and effect of pollutants. The fuel will be compliant and will contribute to the 5.5% of sustainable biofuel and RFNBO target in transport defined in the REDIII. Finally, the gasification co-produces a 10-20% of biochar, which stores carbon resulting in negative CO_2 emission fuels.

3. Communication Objectives

The present file will be based on the following objectives:

- Develop effective activities for dissemination of project results and general information about Geniusfuels projects, the chanllegens solved and its impacts.
- Increase awareness on the impact and possibilities of hydrogen and renewable fuels.
- Inform citizens, companies and stakeholders on the benefits of implementing processes for renewable energy, fuels and hydrogen production as well as their use.
- Increase the interest towards processes related to renewable energy, fuels and hydrogen production as well as their use.

4. Specific communication and dissemination objectives:

The following specific communication and dissemination objectives will be treated:

- Design a comprehensive communication and dissemination plan to ensure broad engagement and widespread visibility of the project's outcomes.
- Develop a distinctive project identity alongside professionally branded dissemination materials.
- Foster dynamic interaction and maintain ongoing engagement both between the consortium and the target audiences as well as within the audience groups themselves.
- Raise awareness about renewable energy, fuels and hydrogen production as well as their use
- Maintain continuous communication and coordination, leveraging synergies with related initiatives and projects.

5. Key dissemination messages to transfer knowledge, the target groups, and main channels

GeniusFuels will start dissemination activities by identifying and mapping key stakeholders involved in the production of biofuel for heavy and long-distance transport. These stakeholders, including research institutions, industry representatives, technology providers, policy makers, regulatory bodies, and potential end-users will be targeted based on their relevance. The

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presence of partners from different European regions will allow the widespread use of the project content and technology with increasing possibilities of success. A table of target groups is reported below together with the key dissemination messages to transfer knowledge and main channels.

Key dissemination messages to transfer knowledge, the target groups, and main channels.

Target stakeholders	Key Messages	Communication channels
Research Community	- Breakthroughs in biofuel production -Methodological advancements	- Scientific journals and publications - Conferences and symposiums - Webinars and online forums
Biomass residue producers	- Opportunity for valorisation of biomass - Potential for sustainable partnerships	- Direct communication with producers - Industry-specific conferences and expos
Fuel users (Maritime Transport, heavy duty, aviation)	- Supply of sustainable IPA - Collaborative opportunities for green fuel testing	- Participation in transport conferences - Collaborative research
Technology Providers (Biochar, Industrial Equipment)	- Cutting-edge technology integration opportunities - Collaborative research and development initiatives	- Direct engagement - Collaborative research publications and case studies
Industrial Partners (Gasification, Catalyst, SOEC and Fuel production)	- Innovative carbon capture technology demonstration - Potential for collaboration and mutual benefits	- Direct meetings and workshops - Industry conferences and exhibitions - Collaborative research publications
Renewable Energy Sector	- Synergies in BCCU initiatives	- Collaborative workshops and webinars - Renewable energy conferences
Investors and Funding Agencies	- Potential for impactful and sustainable investments - Project milestones and success stories	- Networking events
General Public	- Understandable benefits of carbon capture - Contribution to sustainability objectives	- Public talks and seminars - Social media

6. Communication and dissemination tools

Dissemination activities will focus on maximizing the reach and impact of the research outcomes by addressing specific groups who are potential users. Communication tools will target a wider audience.

The following tools will be used to disseminate project results:

- Scientific Publications
- Workshops
- Webinars

The following tools will be used to communicate project results:

- Project Factsheet
- Press release
- Social media

The following tools will be used to for a mixed communication and dissemination of project results:

- Website

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- Conference presentations

7. Visual Identity of the Project

The visual identity and guidelines were include logo, colours, Word template and PowerPoint slide template for project and aknowledgemnts to CETP, European Comminity and Funding Institutions, to be used throughout the project lifetime. All the materials are available to all partners and stored in a Sharepoint. The logo of Geniusfuels (reported below) is composed by a circle that represents circular economy, a water drop which identifies the use of this renewable feed, and a lamp which represents the use of renewable energy as well as the collaboration between the minds and expertise involved in the GeniusFuels project. A leaf representing the renewable biomass feedstock and a lightning bolt representing renewable electricity are also present. The logo is produced in one colour (light green) or in different colours (green, yellow and blue). These colours are also the project colours. The project report should have the project logo in the header, together with the CEPT and co-funded by European Union.

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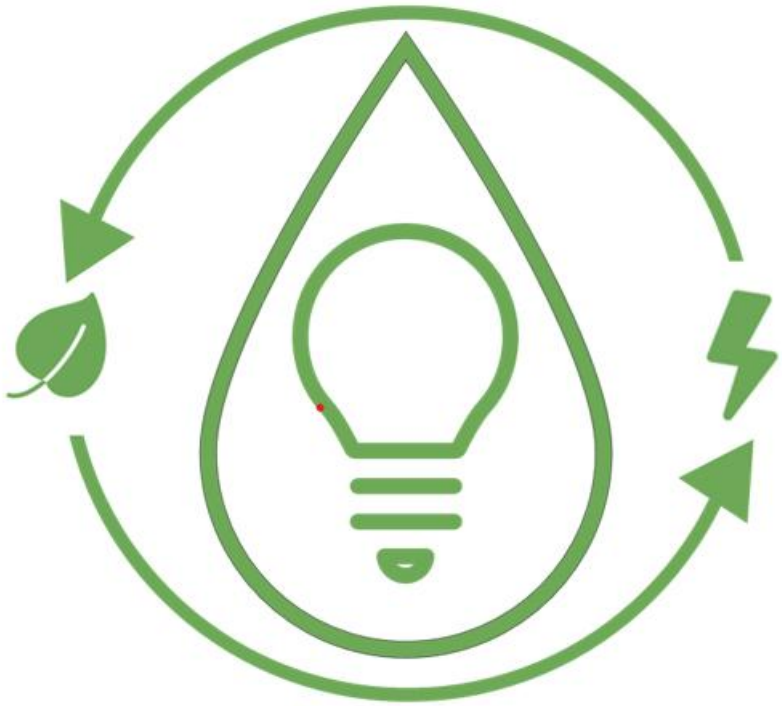

GeniusFuels

8. Online communication strategy

8.1. Website

To have a public-facing platform to be used for stakeholders and citizens to interact with the project, Unibo as the coordinator of GeniusFuels, set up and manage GeniusFuels website, at the url: . This page will be the primary channel for promoting the project and disseminating all public reports, attracting new stakeholders, and facilitating exchanges between projects and other actors. The website will host

- A homepage with project abstract, the acknowledgment for funding, a link to the CETP website and the list of the partners
- Work Packages description
- Objectives
- Partners

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- People involved in the project
- Gallery

8.2. Social Media Strategy

The GeniusFuels project will leverage LinkedIn as a primary platform to engage with a broad professional audience, including researchers, industry stakeholders, policymakers, and clean energy advocates, interested in sustainable fuel solutions for maritime and heavy-duty transport. For this reason the project Linkedn page will aim at:

- Increase awareness of GeniusFuels' groundbreaking integration of solid oxide electrolysis and biomass gasification technologies and downstream processes.
- Showcase scientific advancements, technical milestones, and project outcomes.
- Highlight project collaborations, funding acknowledgments (CETP and European Commission), events, and publications to strengthen the project's image and network.

Content will be published after projects events or milestones as well as to share the CETP initiatives related to the project.

9. Media

When applicable and possible the project will consider publication of articles with the national or international press.

10. Scientific Publications

The publication of scientific articles, conference abstract and oral or poster communications at conferences is foreseen during the project to disseminate key findings, progress, and project results. Journals and conferences relevant to the different fields related to the project will be considered. Furthermore, the project aims to actively engage with the industry and research community by participating in international conferences and industrial fairs/exhibitions focused on biofuels, novel technologies, energy production, and transport. These events include International Conference such as CO2-based fuel and Chemicals Conference, Biofuels andBioenergy (ICBB) (Amsterdam, NL), International Conference on Biofuel Energy, Materials and Technologies (ICBEMT) (Paris, FR).

11. Events

The dissemination will be carried out organising events in 4 countries with a regional engagement. The different locations of these events are relevant to enhance the benefits of the GeniusFuel technology that can be adapted to each area, taking advantage from local resources, in particular biomass residue, which are connected to the nature of the territory.

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Furthermore, these events will quickly foster the uptake of the GeniusFuel solution in the whole European Union.

In addition, the Embassy of the Czech Republic has already given availability to organise an event to present the GeniusFuel project and results at their facilities and similar events will be proposed in collaboration with other European institutions to boost and strengthen relations between Member States represented in the GeniusFuel consortium, and in further countries.

The following dissemination activities will be envisioned:

Dissemination activities

Type of event	Month	Scope
Thematic webinar	M12	Share the developed approach and solutions of GeniusFuel with academia and technology innovators. Discussion on technical aspects.
Medium-term workshop	M24	Present GeniusFuel's results and advancements with industry experts. Invite academia and key experts from industry in scope of the project.
Final workshop Southern Europe	M36	Present GeniusFuel's results and operating technology to academia, industrial stakeholders in collaboration with local institutions.
Final workshop Northern Europe	M36	Present GeniusFuel's results and operating technology to academia, industrial stakeholders in collaboration with local institutions.
Final workshop Western Europe	M36	Present GeniusFuel's results and operating technology to academia, industrial stakeholders in collaboration with local institutions.
Final workshop Eastern Europe	M36	Present GeniusFuel's results and operating technology to academia, industrial stakeholders in collaboration with local institutions.
Bridge Building activities	M18-M36	Congress presentations, poster presentations and participations in other events

12. CETP Knowledge Community

The project will follow the indications and activities of the CETP Knowledge Community to disseminate and communicate the project's results and achievements to the CETP network.

13. Timeline

The Gantt of the communication and dissemination activities is reported below:

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	Month																																	
Task	10	10	10	10	10	10	10	10	10	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
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Thematic Webinar																																				
Mid-term workshop																																				
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