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SUSTAINABLE GREEN CARBON PRODUCTION FROM SOLID BIOMASS RESIDUES: THE ALPS4GREENC PROJECT

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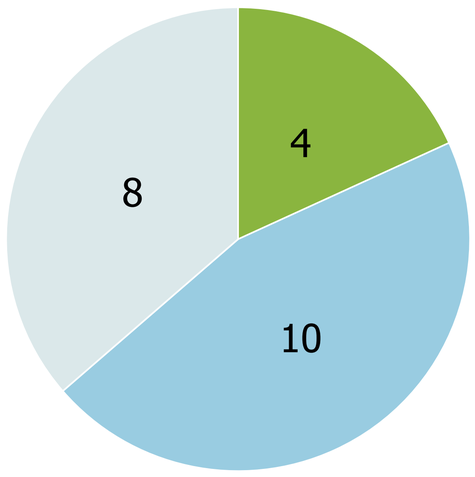
Objectives

Due to the high availability of biomass, the Alpine Region is characterized by a high density of industrial plants for the conversion of biomass. Alps4GreenC - Implementation pathways for sustainable Green Carbon production in Alpine Region aims to accomplish the following:

- valorization of biomass residues through common sustainable pathways with the aims of minimizing waste and preserving resources
- fostering the transition from a linear to a circular economy
- establishing a point of connection and coordination among the Alpine territories of Austria, Italy, Slovenia
- increasing awareness among Alpine Space citizens, plant owners, policy makers and all stakeholders
- investigating the opportunities for biomass conversion focusing on the production of green carbon (biochar)

Implementation

Areas involved



Crowdsourcing campaign results

Residues for pyrolysis

1. Compost screenings
2. Walnut shells
3. Bran
4. Coffee husk
5. Wood chips from broadleaf forestry sites

Residues for gasification

1. River wood debris
2. Vine shoots
3. Spelt husks
4. Wood affected by bark beetles
5. Chestnut wood

Project activities

Crowdsourcing campaign to collect biomass residues and raise awareness

Mapping of stakeholders and resources

Testing and piloting of biochar production

Context and gap analysis of biomass conversion opportunities for green carbon supply

The operating context of the involved countries is analyzed focusing on biomass conversion opportunities for green carbon supply. Current performances are compared with the desired ones and policy recommendations for the relevant stakeholders are provided.

Biochar production – experimental setups

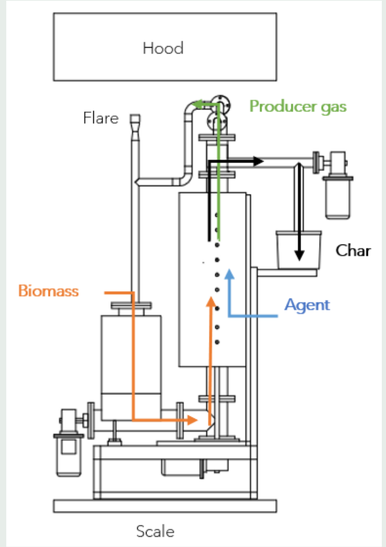
Pyrolysis test
Lab-scale test duration: 1-3 h/test
Residue input: 2.5 kg/h
Biochar output: approx. 0.5 kg/h

Pilot test duration: 3 days (6-8 h /day)
Residue input: 60 kg/h
Biochar output: approx. 20 kg/h


Lab-scale pyrolyzer


Pilot-scale pyrolyzer


Lab-scale gasifier



Pilot-scale gasifier

Gasification test
Lab-scale test duration: 1-2 h/test
Residue input: 1-1.3 kg/test
Biochar output: approx. 0.2 kg/test

Pilot test duration: 6-8 h/day
Residue input: 3 kg/h
Biochar output: approx. 0.5 kg/h

Conclusion

Alps4GreenC contributes to the conditions for energy sufficiency and climate protection of the Alpine Region by setting, for the first time, the scene for the transnational utilization of biomass residues investigating biomass conversion opportunities and proposing transnational biochar-based value chains. The transnational approach of Alps4GreenC supports the identification and upgrade biomass conversion technologies, thus paving the way towards the shift to new green, post-carbon approaches.

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