

CHAR:ME

Polisocial Award 2022

Progetto finanziato da Polisocial Award 2022 - Politecnico di Milano
Project funded by Polisocial Award 2022 - Politecnico di Milano



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January 2023 - June 2024

CHAR:ME

A project that aims to reduce deforestation in Madagascar through a technological solution developed by the collaboration of universities, the third sector and companies.

CHAR:ME | Biochar and biomass-derived products from waste as sustainable and safe domestic fuel

THE PROJECT

The CHAR:ME project is one of the winners of the **POLISOCIAL AWARD 2022 - "Local Development and Ecological Transition"** edition of the Politecnico di Milano.

POLISOCIAL is the program of engagement and social responsibility of Politecnico di Milano that promotes a new way of building and applying university knowledge and excellence, placing social engagement alongside the two traditional cornerstones of academic activity: teaching and research.



The **CHAR:ME** project aims to develop and disseminate a sustainable technology for the recovery of solid fuel from biowaste. The aim is to replace conventional alternatives (wood and charcoal), which are among the main causes of deforestation in developing countries. The case study examined is in Madagascar and includes a pilot experience on the island of Nosy Be.

THE PARTNERSHIP

The working group consists of:

- DICA - Department of Civil Environmental Engineering of the Politecnico di Milano, Andrea Turolla - Scientific contact person of the CHAR:ME project
- DCMC - Department of Chemistry, Materials and Chemical Engineering "Giulio Natta" of the Politecnico di Milano, Matteo Pelucchi - Project Manager of the CHAR:ME project
- DENG - Department of Energy of the Politecnico di Milano, Mauro Braconci
- DEIB - Department of Electronics, Information and Bioengineering of the Politecnico di Milano, Renato Casagrandi
- TTO - Technology Transfer Office of the Politecnico di Milano, Annalisa Balloi

External partners:

- Kukula Onlus – Andrea Scialabba
- Blucomb SRL – Davide Caregnato
- Demetra Onlus – Guido Scaccabarozzi

CONTEXT AND PROBLEM

The project takes place in the province of Antsiranana in northwestern Madagascar, which is affected by intense exploitation of forests for the production of timber used as fuel for domestic cooking of food. This practice has been causing considerable environmental and social damage in Madagascar:

- loss of 40% of forest cover and consequent loss of biodiversity
 - emission of 1-2.4 Gt CO₂-eq or 2-7% of total anthropogenic emissions (a share of these emissions is due to domestic cooking of food)
 - women and children spend an average of 2.2 hours per day on the supply of fuel
 - health risk from the release of pollutants (e.g., carbon monoxide, particulate matter)
 - premature death (about 16,500 cases each year)
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THE SOLUTION PURPOSED BY CHAR:ME

The goal of the project, which started in January 2023 and has a duration of 18 months, is to transform biowaste (which is currently a waste and therefore needs to be managed) into solid fuel alternatives to wood and charcoal from wood.

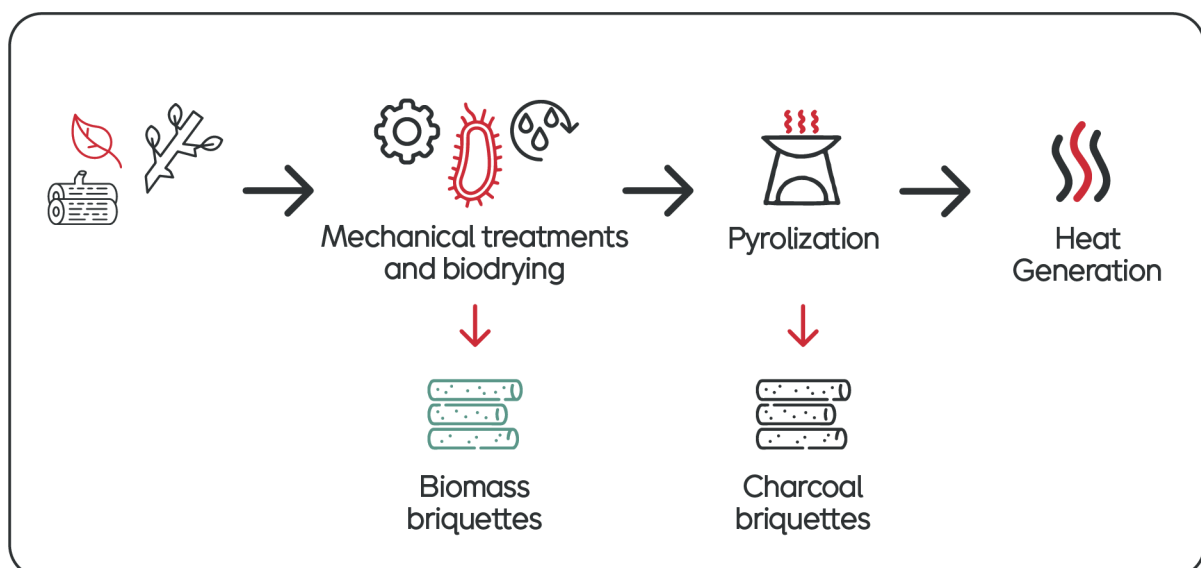
These solid fuels will be produced in two ways:

1. biomass briquettes: with a combination of mechanical and drying treatments (waste is collected and treated in a centralized manner)
2. charcoal briquettes: by adding to the same supply chain a pyrolysis treatment into biochar (centrally collected and treated biowaste + specially designed pyrolysis treatment that also enables heat generation).

The fuels produced are intended for distribution to the local community for domestic use in currently adopted cooking systems with the aim of promoting a virtuous mechanism of biowaste recovery and processing, with a view to preventing environmental and social impacts, including health impacts, in the context of intervention.

The project will be carried out according to the following activities:

1. selection and preparation of biowaste,
2. development of the briquetting process,
3. development of the pyrolysis process,
4. development, prototyping and evaluation of the solution.



One of the main strengths of the CHAR:ME project is to have an integrated approach to the problem; in fact, the activities are developed with a robust and innovative technical-scientific methodology (waste management and treatment, development of innovative technologies based on (bio)chemical and energy processes, definition and implementation of sustainable development models, and ecology and environmental sustainability), in close continuity with the application context and local stakeholders, and with due consideration of non-technical aspects. In this way, practical limitations can also be overcome with a view to replicability of the solution after project closure.

www.polisocial.polimi.it

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