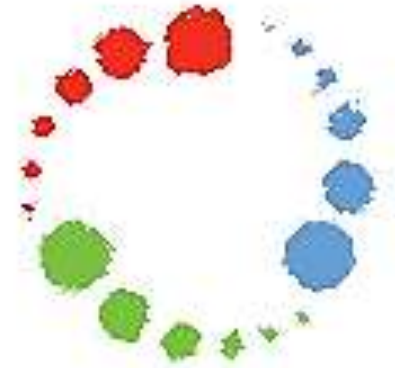




universidade de aveiro

**ENVIRONMENTAL IMPACTS OF
BIOMASS-TO-ENERGY CONVERSION
TECHNOLOGIES:
GRATE BOILERS AND FLUIDIZED BED BOILERS**

Tamíris da Costa, Paula Quinteiro, Luís Tarelho, Luís Arroja, Ana Cláudia Dias

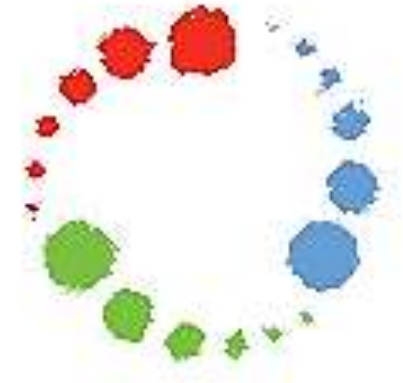
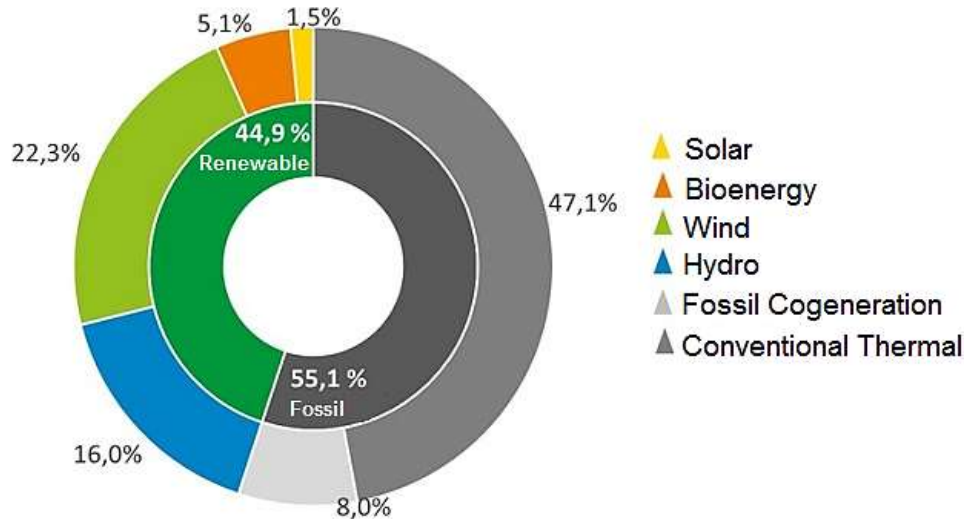


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INTRODUCTION

Electricity production from biomass has the potential to make a significant contribution to the power mix in Portugal **with less environmental impact than non-renewable resources.**



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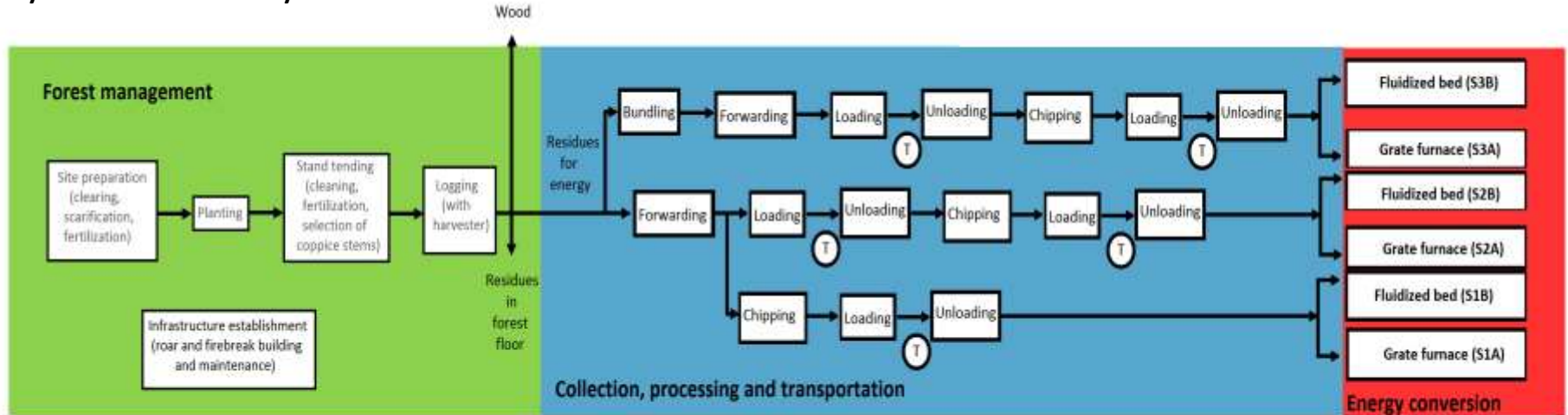
OBJECTIVES

This study assesses some of the environmental impacts of producing energy from eucalypt residues in Portugal, considering two types of technologies: grate furnaces and fluidized bed furnaces. Moreover, it identifies the operations with the largest environmental impact. **This analysis is particularly important given the forest residue market in Portugal and the increasing demand of forest residues for bioenergy.**



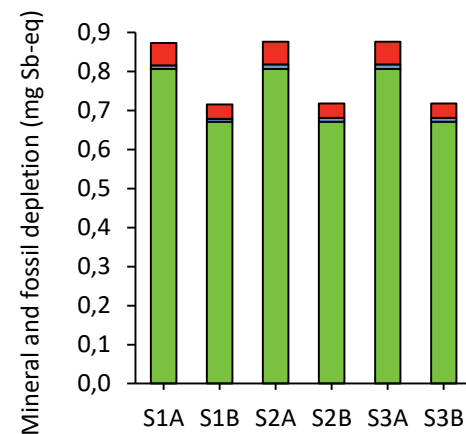
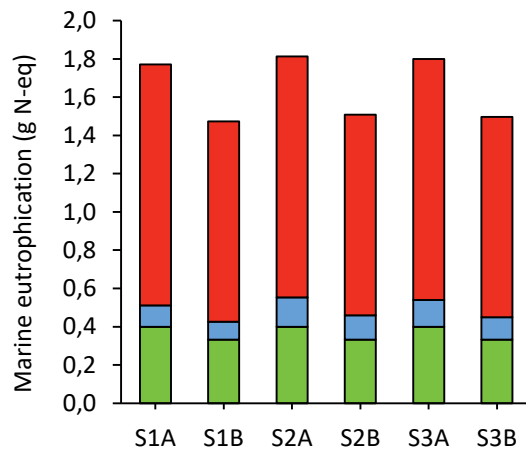
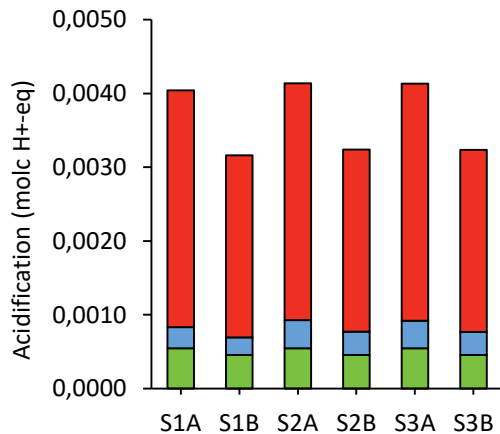
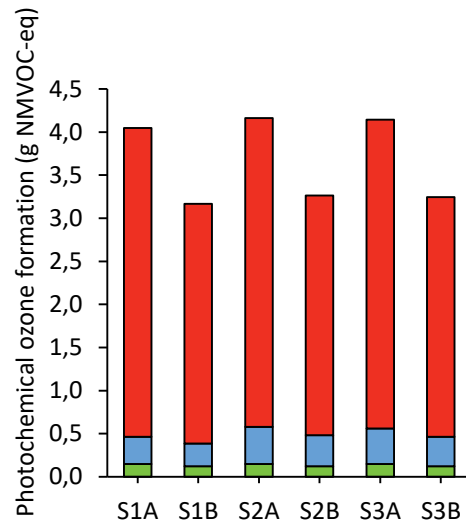
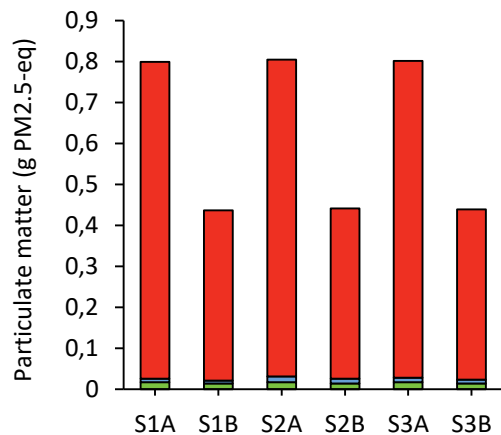
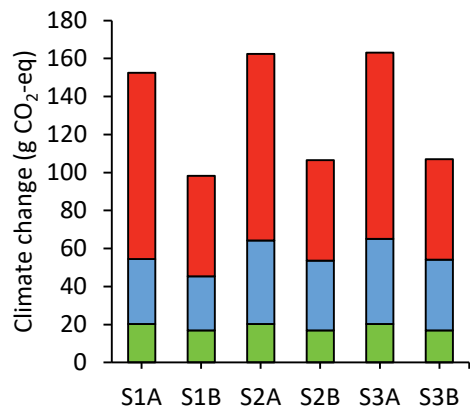
METHODOLOGY

System boundary



The functional unit is the production of 1 kWh of electricity to the national grid. The impact assessment methodology implemented to carry out the study was the ILCD (JRC-IES, 2010).

RESULTS



Energy conversion

Collection, processing and transportation

Forest management

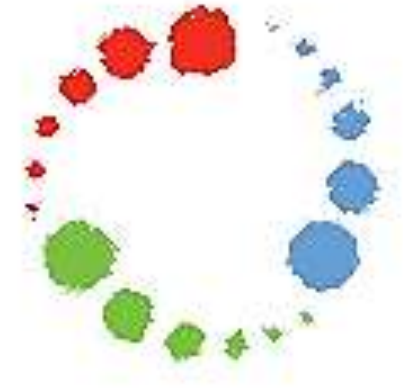
How could my work be used in policy?

The technologies used in Portugal for residual forest biomass combustion are:

- 13 plants with fluidized bed;
- 8 plants with grate furnaces.

- According to the National Strategy for Energy, **15** new thermal power plants will be constructed by 2020 (installed capacity of 100 MW)

Why do not they just implement fluidized beds?



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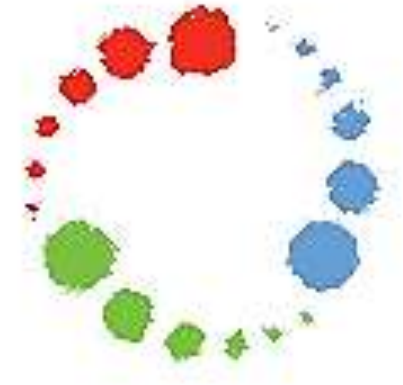
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How could my work be used in industry?

Currently, the Portuguese emission standard of NO_x for biomass combustion is 600 mg/Nm^3 .

- But will be reduced in 2019 to a maximum of 300 mg/Nm^3 .

Why do not they just change for fluidized beds?

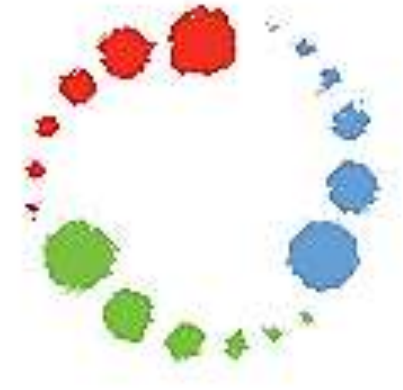


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How could my work be used to users?

Finding ways to provide more environmental friendly electricity is becoming increasingly necessary to mitigate climate change.

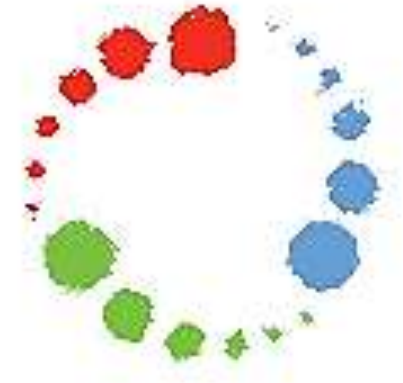


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CONCLUSION

- The study shows that the fluidized bed technology presented a smaller impact than the moving grate technology.
- The study shows the need of a transition to a low-carbon technology in the energy industry.
- The methodology adopted here can also be applied to other countries as a decision supporting tool.
- To cover other technologies, sharing information in an application is encouraged.



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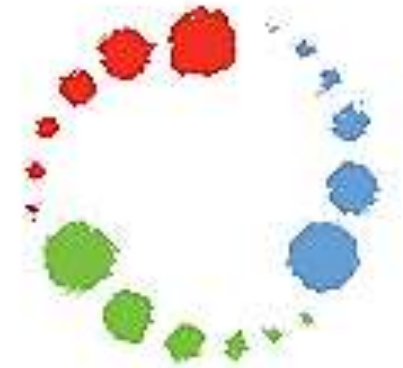
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Thank you!

Any questions?

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