

# “Ashes” – Recovery of Nutrients from Ashes Produced by Thermochemical Processes Based on Bagasse

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## Background

Bioethanol production in Brazil gives rise to about 250 million tons of bagasse annually. Most of the production residues are subjected to thermal utilization. Some of the plants used for this purpose were built as early as in the 1960s. Hence, their energy efficiency is far from being optimum. Intensive cultivation of soils and application of untreated residues, such as vinasse, result in an insufficient supply of nutrients to the soils. Therefore, the soils are increasingly acidified or salinized. The international, BMBF funded project “Ashes” aims at developing concepts for an integrated use of nutrients based on highly efficient co-generation plants. It is a cooperation of seven German with four Brazilian partners.

## A German - Brazilian Collaborative Project of the following partners:



## Work packages in the Project:

- In Brazil, the residues of bioethanol production are widely used for the generation of electricity and heat by gasification and combustion.
  - Development and improvement the process conditions that they will become more efficient and economic.
- Currently, an efficient use of the ashes as fertilizer is prohibitive because of potential damage to the soils. The goals are:
  - To perform process optimizations and developments for the production of low-pollutant ashes that can then be processed to full-fledged and competitive recycled fertilizers.
  - To separate the nutrients from the ashes and to investigate, if the remaining ash residues can be used as functional fillers of biopolymer compounds and to what extent.

## This requires:

- To determine the properties of the different fuel types and of their mixtures with nutrient-rich additives.
- To perform gasification and combustion experiments.
- To determine the properties of the ashes and to perform tests on real plants to assess their performance as fertilizer.
- To determine the optimum way to manufacture a fertilizer from the ashes.
- To investigate the applicability of the ashes for their use as functional fillers in bio-polymeric compounds.

## Aims of the project

- Development and implementation of processes which help to close the nutrient cycle in an economic and ecologic way after the thermal treatment of biomass.
- To reduce the exploitation of natural phosphate resources and to improve the quality of the soil and the drinking water.
- To reduce CO<sub>2</sub> emissions.
- To offer an enormous commercial potential via the optimization of existing plants and via a more efficient thermal utilization.
- The intended recycling scheme will reduce the dependency of the regional nutrient cycles from the regional markets in the long term.

## Fundings

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