

## LCA of different energy sources for a water purification plant in Burkina Faso

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### ABSTRACT

This article presents a natural coagulant obtained from *Moringa oleifera* seeds used to reduce water turbidity. The residue generated by an oil extraction plant from *M. oleifera* seeds is valued as coagulant in an automatized water purification plant that needs power supply. The main objective of this study is to find the most suitable and sustainable power supply option with regards to a specific zone of Burkina Faso. This article discusses the possibility to deploy a sustainable system providing water purification and electricity to a village of Burkina Faso. Three scenarios are considered to power up the water purification plant (A: electricity grid, B: diesel generator and C: solar panels supported by second life EV batteries). The environmental impact of these three scenarios is done following the life cycle assessment (LCA) methodology based on energy and resources consumption during the material extraction, elements manufacturing, use and dismantle phases. The less pollutant option for this case in Burkina Faso is the “solar panels supported by second life EV batteries”. In comparison to the other scenarios, this system entails a significant reduction of the environmental impact, mainly in the categories of climate change and fossil depletion.

*Keywords:* Life cycle assessment; Energy sources; Water purification plant

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