Team 2020-28 - Design of an Efficient Kettle for Off-Grid Kenya

Paul Lavender-Jones, Luke Peacock, Luke Evason, Nicole Wan, Cameron Everist

Theme – Cooking

Proposal

We have proposed a design for a dual-mode insulated kettle with an integrated filtration system.

Project summary

The aim of this design is to provide boiling water for cleaning, drinking and cooking, whilst also providing a means for sterilising water.

Key design highlights

By having a secondary mode that only heats the water to 70°C, the design can help save energy when the user does not require boiling water. Insulation not only increases efficiency, but also reduces the frequency of boiling by keeping water warm for longer. Opting to use an electrical appliance to boil water, rather than the traditional 3-stone fire, lowers carbon emissions through reduced biomass combustion, as well as offers health benefits from less exposure to fumes.

Cost

Bill of materials (BoM) cost is hard to calculate for certain, but when designing, the target was to aim for around $30 USD. Mass manufacturing of the kettle will be cheap but initial capital for machinery may be significant.

How does your design help to work towards the Sustainable Development Goals (SDGs)?

Our design addresses SDG 6, which focuses on providing clean water and sanitation for all, a problem that is particularly apparent in Sub-Saharan Africa. The kettle also directly helps SDG 7 (Affordable and Clean Energy) and SDG 5 (Gender Equality).

Social, environmental and economic considerations

The full lifecycle of the device has been considered in relation to the environment to reduce e-waste and the possibility of the device ending up in a landfill. Furthermore, all non-electronic materials are recyclable.

Marketing has also been considered to ensure we are contributing to SDG 5 (Gender Equality).

Link to the Full Report

Video Submission