

# The Infinity Oven

Source: [willhatcher.co.uk](http://willhatcher.co.uk)

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The Infinity Oven is a low cost solution which enables bakery entrepreneurs and communities in the developing world to harness the power of the sun, baking and cooking more sustainably: smoke free and fuel free.

## The Inspiration

Cooking with firewood in the developing world is unsustainable and dangerous. It requires people, more often that not women, to walk large distances to fetch the wood which is both arduous and contributes to deforestation. Cooking with coal or gas or other fossil fuels is expensive and economically unsustainable as entrepreneurs are exposed to fuel price volatility. Cooking is often done indoors where the smoke produced is dangerous and can lead to health issues, cancers and asphyxiation for adults and children.

Whilst doing research into these issues, we discovered a tender online by a charity working in Burundi, R20, who expressed a desire for a solar oven solution to convert their existing firewood

bakeries to solar bakeries. The key requirements were to have a capacity of 300 bread rolls per day and have a cooking experience comparable to a firewood oven (in terms of temperatures).

## **Stages of Development**

Our design evolved over time from our initial discussions of the needs of the people we were trying to help (bakeries in Burundi) to sketches to quite a few small scale prototypes.

We soon learnt from the prototypes that making a parabolic bowl would be time consuming and difficult to make well due to the 2D curvature. Low cost and ability to manufacture in the country of use were very important so we explored a range of designs and prototypes before producing a few CAD models.

Once we had a CAD model of a basic concept, we were able to run thermal models which helped us to quantify the performance of each of our designs, learning how conduction, convection and radiation affect our thermal performance. We were then able to iterate and our designs fairly quickly as we knew quantitatively the effect of each design change.

## **The Function**

The Infinity Oven harnesses sunlight to heat the oven to temperatures up to 220 degrees. It achieves this by using a large reflective parabolic dish to concentrate the sun's rays unto the cooking box. The box is double glazed on the sides and bottom, allowing light through to heat the oven whilst trapping air, preventing the heat from coming out. The oven is also insulated with Rockwool on top to reduce heat loss further.

The oven has two independent chambers, each with a thermometer in the side walls enabling the user to monitor the cooking temperatures from the outside and cooking two batches of food simultaneously.

Made predominantly from recycled oil drums and locally source-able materials such as wood, bamboo and clay, it can be produced at very low cost in as little as two days.

## **The Infinity Team**

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