

## EFFICIENCY OF A COMPOUND PARABOLIC CONCENTRATOR KITCHEN IN IZTAPALAPA, MEXICO CITY.

E. Barrera Calva<sup>1</sup>, Verónica Frías<sup>1</sup>, E. Antaño Díaz<sup>1</sup>, E. Rincón Mejía<sup>2</sup>, J. Hernández<sup>3</sup>

1: Process engineering and hydraulics. Basic Sciences and Engineering.  
Autonomous Metropolitan University, San Rafael Atlixco Avenue 186 Leyes de Reforma first section  
zip code 09340 Mexico City.

veronicafriasenergia@gmail.com, <http://ixil.izt.uam.mx/pema/index.php/dr-enrique-barrera-calva/>

2: Autonomous University of Mexico City, San Lorenzo 290, corner Roberto Gayol, Del Valle  
Sur, Mexico City, Zip Code 03100.

rinconsolar@hotmail.com, [https://www.researchgate.net/profile/Eduardo\\_Rincon-Mejia2](https://www.researchgate.net/profile/Eduardo_Rincon-Mejia2)

3: Solar Module, Sea of the Nectar Apple 116 Lot 5 Z.C. 13460 juanamariajarquin@hotmail.com

**Abstract:** A concentrated solar-powered parabolic concentrator stove is built, a thermal analysis is carried out, the temperature profiles are obtained at daytime and its thermal performance to demonstrate its mitigating capacity and the benefits that are obtained from being implemented at the city level, such as at the national level. Taking into account the high concentrations of pollutants that exist in the air in a city as populated as Mexico City (8.918 million inhabitants) and the health problems that are there, it is necessary to attack the problem. A very good strategy to breathe a cleaner air in cooking food that uses solar energy. An effective surface kitchen of 0.791 m<sup>2</sup> is built, with Stainless Steel Absorber, surface of Polished Steel, covered with clear glass and as insulating polyurethane foam. (see image 1).



Image 1. CPC kitchen.

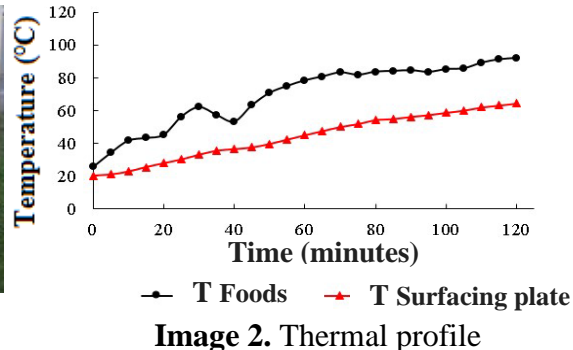


Image 2. Thermal profile

By placing it in the sun with food on August 18 in Mexico City, with a level of insolation of the order of 18 MJ / m<sup>2</sup>, a thermal profile can be seen, see figure 2, which leads to a thermal efficiency of the order of 17.88%. Assuming that the solar cooker is used in a day at least 3 hours in the home, the heat used is 1.96 MJ, which represents the energy displaced by fossil fuels, which represents savings in one day. Taking into account its useful life of 15 years, the energy saving could reach 10.71 GJ unitarily. The scope and impact that this solar technology could have is the reduction of 1.43 MtCO<sub>2</sub> nationwide.

**Keywords:** Thermal, Solar, Thermal profile, mitigating capacity, thermal efficiency.

