# SOLAR COOKING:

## Advances and learning from solar thermal cooking programs in Kenya

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Photo credit: Ecomandate

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# What is a solar cooker?

Collect light

Absorb light

Retain heat

Ease and Efficient

Safe and Sustainable



Photo credit: Macedonia Ministries

# What is a solar cooker?


Photo credit: Alan Bigelow, Ph.D.

- Collects and absorbs direct sunlight and retains heat to cook food or pasteurize water
- Solar-thermal cooking
- Hundreds of variations of these types


Photo credit: Shannon Watkins


Photo credit: Alan Bigelow, Ph.D.

**Complementary technologies:**

- Retained-heat basket
- Water pasteurization indicator (WAPI)

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# What is a Solar Cooker?

Fresnel mirror

Evacuated tube

Fresnel lens

Institutional Cooking

Photo credits: Alan Bigelow, Ph.D.

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# Why solar cooking?

- Zero air pollution and zero greenhouse gas emissions
- Zero inhalation of smoke
- Zero fuel cost
- Scalable and sustainable solution
- Inclusive and equitable
- Reduces deforestation and protects biodiversity
- Provides nutritious meals
- Lessens time and danger from collecting biomass fuel
- Can be used for drying food, pasteurizing water
- Cost effective and requires no infrastructure

Photo credit: FoST

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# Why Solar Cooking?

Photo credit: Unknown

## Household Air Pollution:

- ~ 2.3 billion people cook using polluting open fires
- 3.8 million people die prematurely each year
- Half of pneumonia deaths of children under 5 are caused by household air pollution

# Who is Solar Cookers International?

## Mission & Vision

SCI promotes climate-friendly solar cooking to improve human health, economic well-being, women's empowerment, and the environment for vulnerable populations worldwide.

- Non-profit leading and convening the solar cooking sector since 1987
- Hundreds of collaborators in over 140 countries

Photo credit: Kriti Shrestha

# How does Solar Cookers International work?

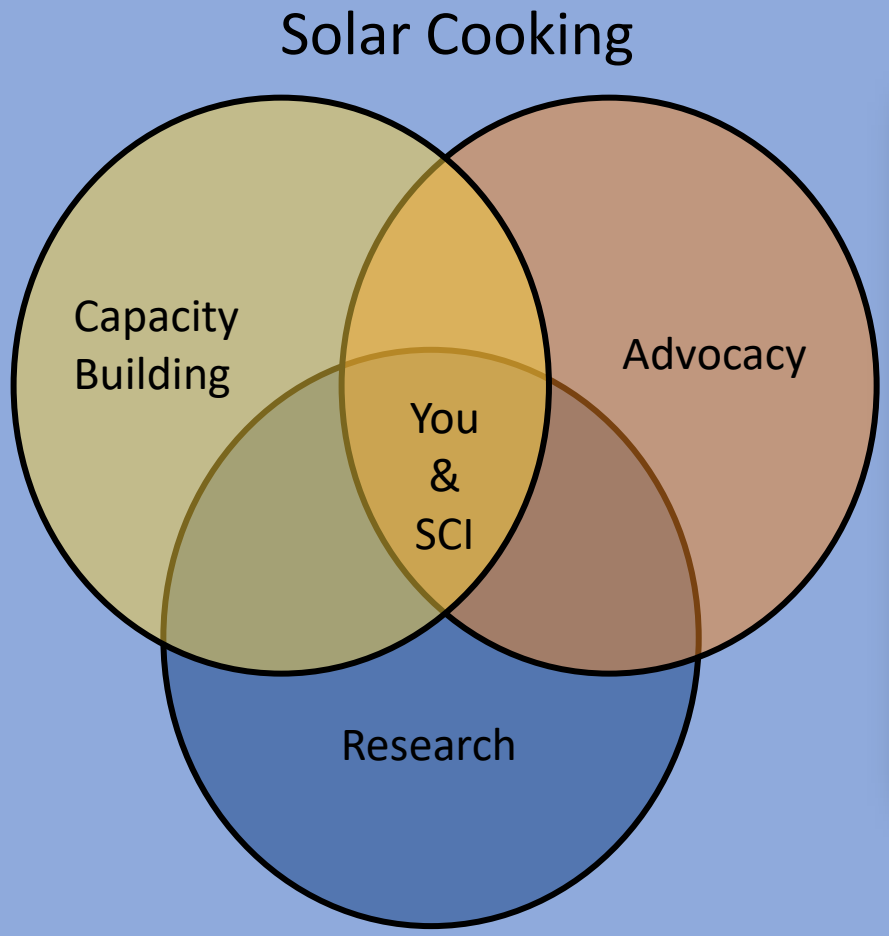


Photo credit: Varendra Joshi

# Research

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# Research: Performance Evaluation Process (PEP)

- Harmonizes with the International Organization for Standardization (ISO)
- Measures Standard Cooking Power in watts
- Unbiased, scientific, replicable
- Helps to make informed decisions
- Brings credibility to the sector

Photo credit: Alan Bigelow, Ph.D.

# SCI Performance Evaluation Process test centers

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(1) California *(USA)*

(2) New York *(USA)*

(3) Nepal (*Asia*)

(4) Kenya (*Africa*)

Photo credits:
Shannon Steffy,
Raman Aylur Subramanian,
Alan Bigelow, Ph.D.

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## Official Results from the Solar Cookers International (SCI) Performance Evaluation Process (PEP)

Solar cookers are listed below and color-coded by type: reflective-panel cookers (orange); box ovens (green); and evacuated tubes (purple).

| Solar Cooker Name (alphabetically) | SCI Solar Cooking Wiki Link | Standard Cooking Power (watts) |
|---|---|---|
| [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] |
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# How and why does SCI advocate?

SCI encourages governments and civil society organizations to include solar cooking and has had Special Consultative Status with the United Nations since 1996!


Photo credit: Alan Bigelow, Ph.D.

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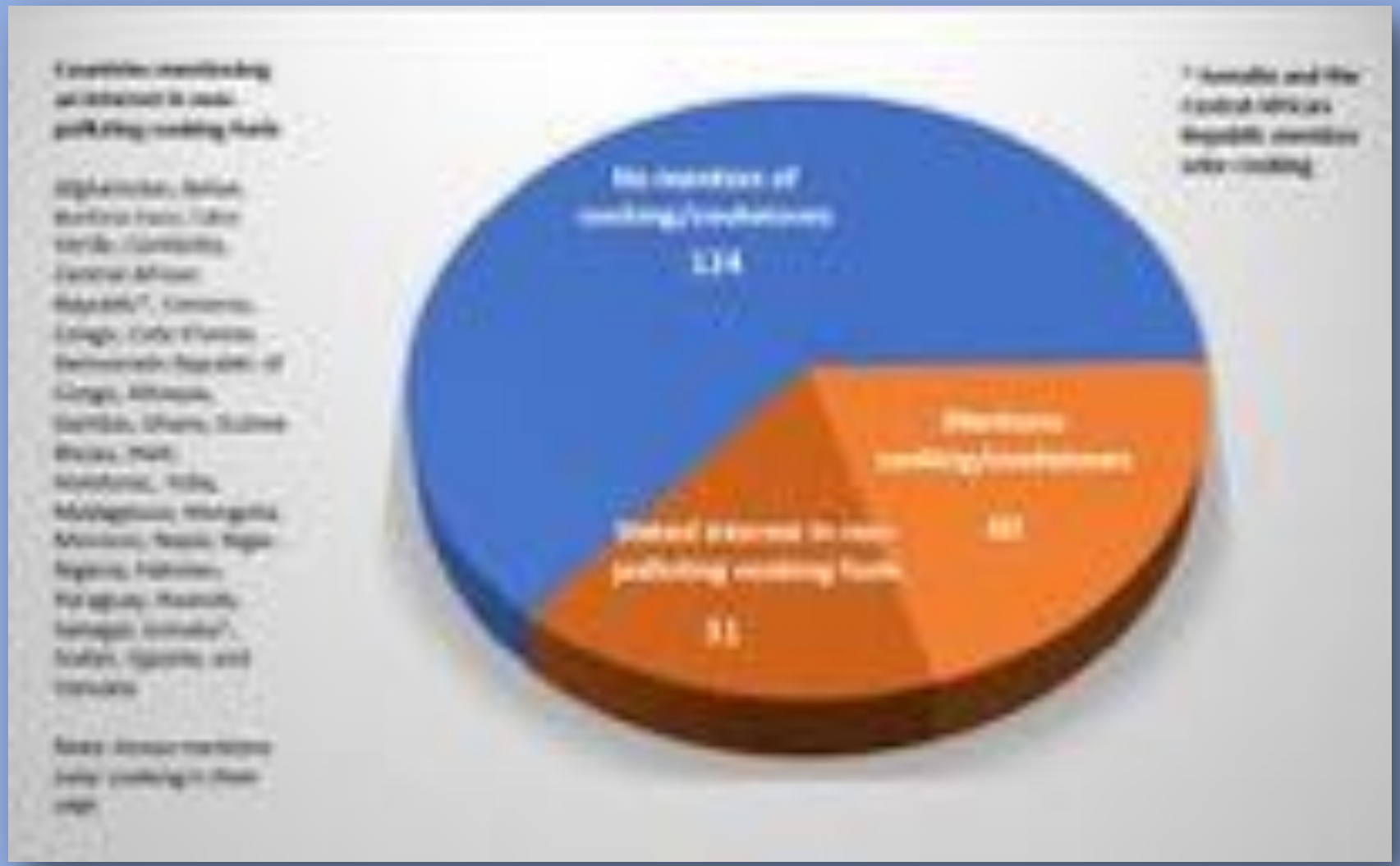
# Countries' Plans to Address Climate Change:
## Nationally Determined Contributions (NDCs)



1 simple solar cooker can save 1 family from burning one ton of wood in a year

Imagine that multiplied by the ~ 2.3 billion people cooking over open fires

# Building Capacity

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# How and why does SCI build capacity?

A big challenge requires a united and collaborative effort!

Photo credit: Cleophas Kosgei

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# Solar Cooking Worldwide

- 4+ million solar cookers worldwide:
  - Over 14 million people directly impacted by solar thermal cooking
  - 7.7 billion meals cooked via solar thermal
  - 1 solar cooker avoids 1 metric ton of firewood annually
  - Reducing $CO_2$ emissions by over 30 million tons over the lifetime of the solar cookers

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# Leadership through Data Collection and Analysis

Photo credit: FoST

## Quick Needs Assessment

- Assess need and desire for solar cooking
- Critical step towards success
- Formulates appropriate initiatives

## Adoption and Impact Survey

- Baseline and post-distribution data
- Quantify use and impact
- Support adoption of solar cookers with user data

# Resources for the solar cooking sector

## Solar Cooking Wiki

The world's largest online solar cooking resource with over 1,800 pages of online solar cooking information and translatable into over 35 languages

Visit: www.solarcooking.org

## John Collentine Solar Cooking Toolkit

An online collection of materials organized for multiple audiences by modules


Visit: www.solarcookers.org/sci-toolkit

# Solar Cooking successes in Kenya

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# Cooking scene in Kenya

Photo credit: Alan Bigelow, Ph.D.

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# Cooking-fuel market
# Kakuma Refugee Camp, Kenya

Photo credit: Alan Bigelow, Ph.D.

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# Quick Needs Assessment

## Pre-solar cooking approaches of selected participants



Photo credits: Ecomandate

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# Success: Locally Manufactured solar ovens

Photo credits: Ecomandate

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# Training sessions and solar cooker distribution

Photo credits: Ecomandate

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# Success: Empowering women



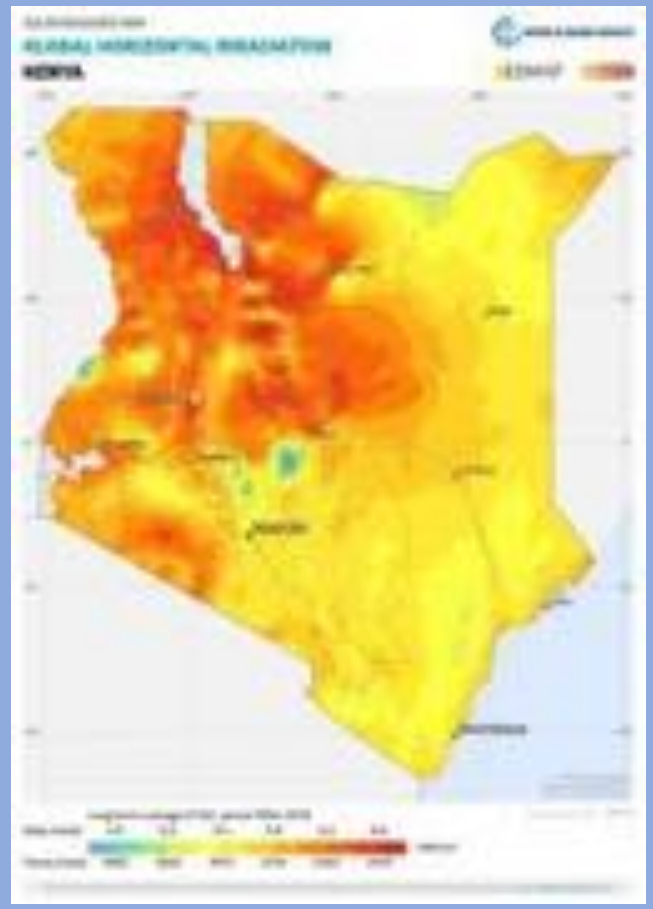



Photo credits: Ecomandate

# Outcomes and key cooking statistics in Kenya

Data from SCI's project at Kakuma Refugee Camp, Kenya, indicates:

- One solar cookstove can save one tonne of wood per year
- Cookstove users save an average of ~ $70 USD per year on cooking fuel
- Cookstoves projected to last 15 years and cook for up to 10 family members
- Kenya averages 2,400 hours of sunshine per year



Kenya cooking sector study data indicates*:

- 64.7 % of Kenyan households use wood as primary cooking fuel source
  - = 8.1 million households
- Average of 25.9 kg of fuel wood for cooking per week
  - = 1.3 tonnes per year
- Average 396 KES/week ($2.82 USD/wk) spent on fuel wood for cooking
  - ~ 20,592 KES/yr
  - ~ $147 USD/yr

*Source: Kenya Household Cooking Sector Study (2019)

# Success: SCI Wins Keeling Curve Prize in 2021 for work in Kakuma

Solar Cookers International has been named a winner of the Keeling Curve Prize! The Keeling Curve Prize recognizes "the most impactful climate projects around the world."

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# Solar cooked food at Kakuma Refugee Camp



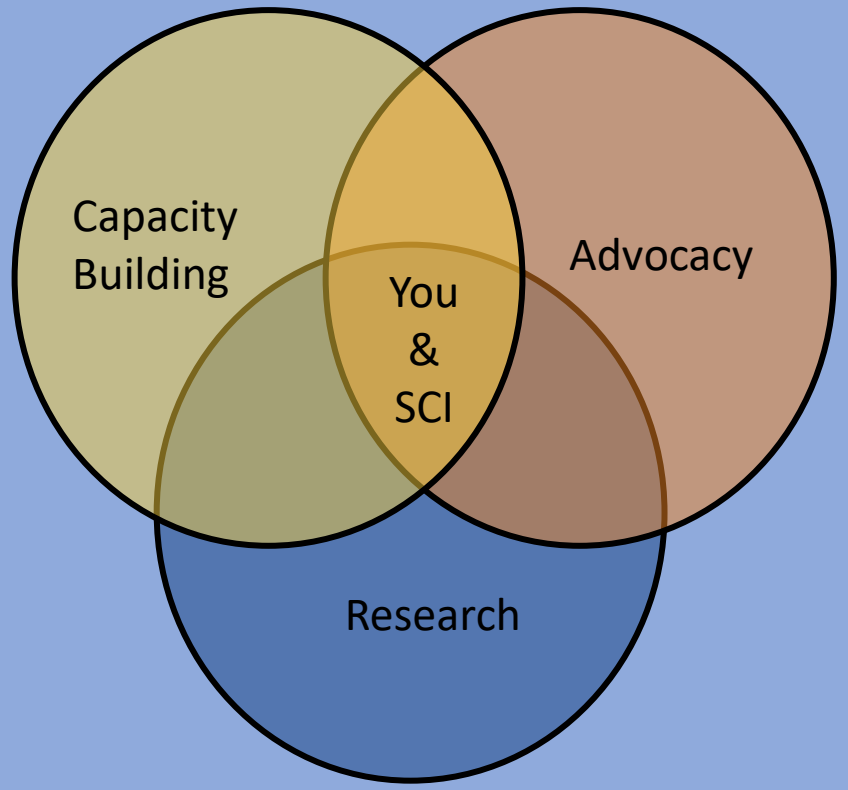


*Solar cooked local food, left to right: peas, rice, beans, potato and tomato stew, and rice & beans*



Photo credits: Ecomandate

# What can you do? (How to engage with SCI)




- Sign up for more information: www.solarcookers.org/connect/get-our-news
- Access and use SCI's resources: www.solarcookers.org & www.solarcooking.org
- Support SCI https://www.solarcookers.org/donate
- Join the SCI Association: www.solarcookers.org/partners/sci-association
- Consult with SCI: www.solarcookers.org/connect.consult
- Include solar cooking in your individual, organization, and country's work, support, and policies

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# Thanks to…:

- ReEnergy Africa Summit 2022 organizers
- SCI Global Advisors
- SCI Board of Directors
- SCI United Nations Representatives
- You!
- SCI Associates
- SCI supporters
- SCI volunteers
- SCI collaborators

Photo credit: Ecomandate