

# Expression of Interest for PILOT-CUM-DEMONSTRATION OF SOLAR-BASED INDUCTION COOKING SOLUTIONS

Despite significant technological advancements, ~2.6 billion people worldwide still lack access to clean cooking solutions. This not only costs trillions of dollars in damage to the climate and local economies but also results in ~4 million premature deaths annually. In this context, India has taken various initiatives to promote clean cooking that operate at the intersection of 10 Sustainable Development Goals (SDG) - including SDG 3: Good Health & Well-being, SDG 5: Gender Equality, and SDG 7: Affordable and Clean Energy.

The Solar-based Induction Cooking Solutions (S-ICS) are increasingly being preferred over the traditional biomass-based cooking systems to transform the way people cook and for its wider impact on improving health, saving lives, enhancing livelihoods, empowering women and protecting environment. Multiple country governments, global philanthropic organizations, impact investors and private players have shown interest in the solutions and have launched various initiatives.

Over the years, the Government of India has also launched several initiatives aimed at promoting clean cooking and sustainable energy sources through various agencies. Under the Central Government's flagship programme, Ujjwala 2016, access to free liquefied petroleum gas (LPG) connections for women has increased significantly. The proportion of rural households using LPG as the primary fuel increased from 11% in 2011 in rural India to 49% in 2020-21. However, low-income households continue to rely on polluting fuels as they are unable to afford monthly operating cost of LPG cylinders. Therefore, they do not refill LPG cylinders and instead rely on freely available traditional fuels.

The Ministry of New and Renewable Energy (MNRE) aims to introduce a comprehensive scheme through Energy Efficiency Services Limited (EESL) for scaling up the S-ICS across the country by leveraging the benefits of carbon financing, making it a ground-breaking effort to address climate change concerns. The large carbon credit accumulation envisaged under the scheme would also help spur the compliance carbon credit market, recently introduced in an Amendment to the Energy Conservation Act in 2022. Implementation of this scheme will demonstrate India's commitments towards promoting sustainable development as it will impact the following

**Global SDGs** as under:



Energy poverty reduction among poor households



Reduced cooking input cost and improved food nutrition



Enhanced health outcomes via improved indoor air quality and reduced fire/accident risks



Increased time for educational entrepreneurship opportunities and skill building due to reduced cooking time



Increased time (of women) for income-generating activities due to reduced cooking time



Clean water access (boiled using S-ICS), especially to the people dependent on open-source drinking water (e.g., river, well, and pond water)



Increased clean and affordable energy access in rural areas



Sustainable economic growth, job creation, increased productivity, entrepreneurship, and sustainable business practices.



Decreased reliance on fossil fuels, less indoor air pollution and increased use of clean energy



Sustainable land use, reduced deforestation, reduced greenhouse gas emissions, increased renewable energy use, and improved soil quality.

## THE ISSUE: LACK OF ACCESS TO CLEAN COOKING

Primary reliance on polluting fuels and technologies for cooking<sup>1</sup>

32.1%



of Indian population

~442 MILLION



of Indian population

~111 MILLION



Indian households

### Primary cooking fuel - 2020-21<sup>2</sup>



33.8%

Households using Firewood, chips and crop residue



Rural 46.7%



Urban 6.5%



62.0%

Households using LPG



Rural 49.4%



Urban 89.0%

### 24-hour average PM 2.5 AQG levels<sup>3</sup>

WHO Recommended levels

< 15 µg/m<sup>3</sup>

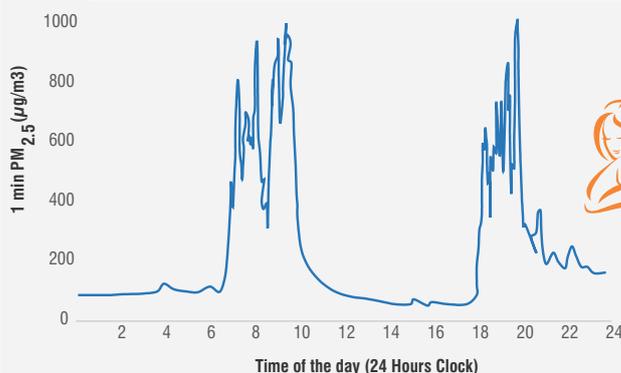
Outdoor levels in Indian villages

~130 µg/m<sup>3</sup>

Indoor levels in Indian rural households during cooking

> 1000 µg/m<sup>3</sup>

### PM 2.5 Concentrations in Indian Rural Households<sup>3</sup>



Women and children are more frequently exposed to elevated levels of HAP and therefore bear a greater burden. Additionally, they are responsible for time-consuming task of collecting fuelwood



India's 20-50% of ambient air pollution is caused by indoor cooking and heating<sup>4</sup>



0.8 million premature deaths due to Household Air Pollution<sup>5</sup> (HAP)

# AMBITION: DEPLOYMENT OF SOLAR-BASED INDUCTION COOKING SOLUTION (S-ICS)

As a first step to scale up the S-ICS across the country, the EESL has envisaged a first-of-its-kind pilot-cum-demonstration project to initiate market-based interventions for the deployment of at least 100 S-ICS (grid-connected solutions) in Indian households (using cooking fuels like firewood or cowdung) to gather practical learnings which can be leveraged during mass scale roll out. This note substantiates the contours of the pilot that EESL intends to perform in partnership with a willing partner agency (i.e. philanthropic organizations, multi-lateral and bi-lateral donor agencies, impact funds etc).

- **Pilot phase:** At least 100 S-ICS to be deployed
- **Implementation Phase 1 :** 1 lakh S-ICS to be installed in actual implementation during FY2024.
- **Implementation Phase 2 / Scale-up:** 2 crore S-ICS to be installed in a phased manner by FY2028.
- Most of the intended beneficiaries to get the S-ICS practically at no cost.
- Combination of demand aggregation, carbon financing and Govt. subsidy to fund the actual program implementation.
- The systems installed during both pilot and rollout phases will be continuously monitored by relevant authorities to ensure proper usage, safety of equipment and analysis.

## Target End-users:

Rural Indian households who are currently primarily dependent on traditional biomass for cooking. Further, the beneficiaries will also be required to provide the following documents:



Copy of Government authorized ID proof



Beneficiary certificate of PMA Scheme (If applicable)



For BPL Consumer – Copy of the BPL Certificate

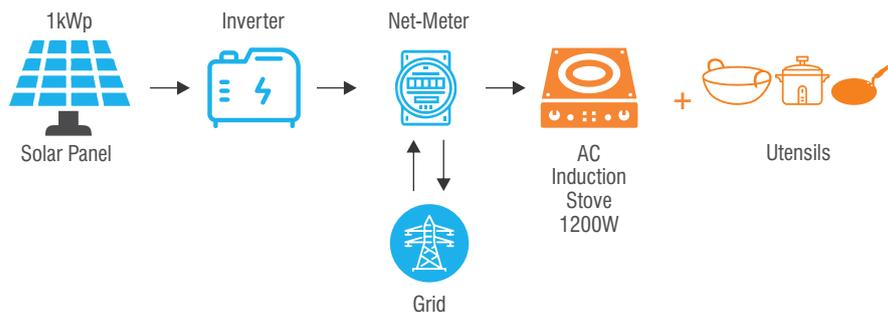


Proof of house ownership/Residence

## Step 1 Pilot phase

**Objective:** To develop a proof of concept for scaling up the S-ICS (grid-connected) across the country

**Grid-Connected: ~INR 80,000**



In this phase financial support is required for the following:

- 1) **Baseline data collection** for ~4,000 households to monitor and evaluate the project outcomes and carbon credit benefits
- 2) **Install at least 100 S-ICS systems** at target beneficiaries' residence

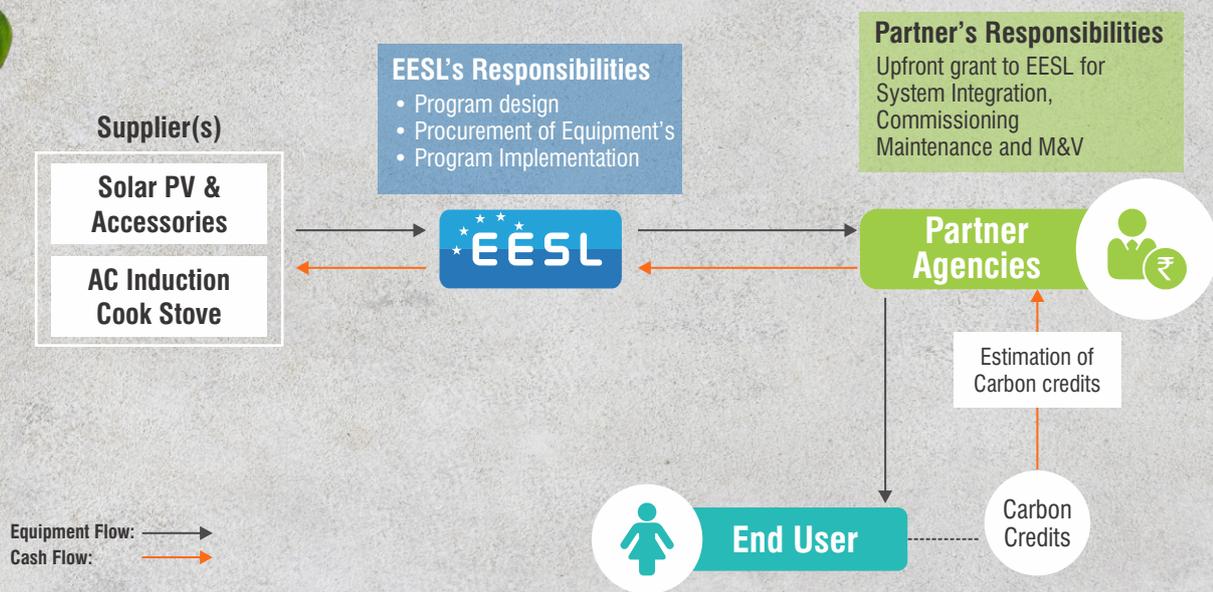
## Target Partner Agencies:

Philanthropic organizations

Multi-lateral and Bi-lateral donor agencies

Impact funds working on various SDGs

## GO GREEN, GO SOLAR, REDUCE YOUR CARBON FOOTPRINT



## Step 2



### Proof of Concept

Closely monitored the pilot phase installations to understand:



Suitability of the technical configuration



Field level implementation constraints



User experience



Quantum of carbon credit generated



Changes required in project plan for successful implementation

## Step 3



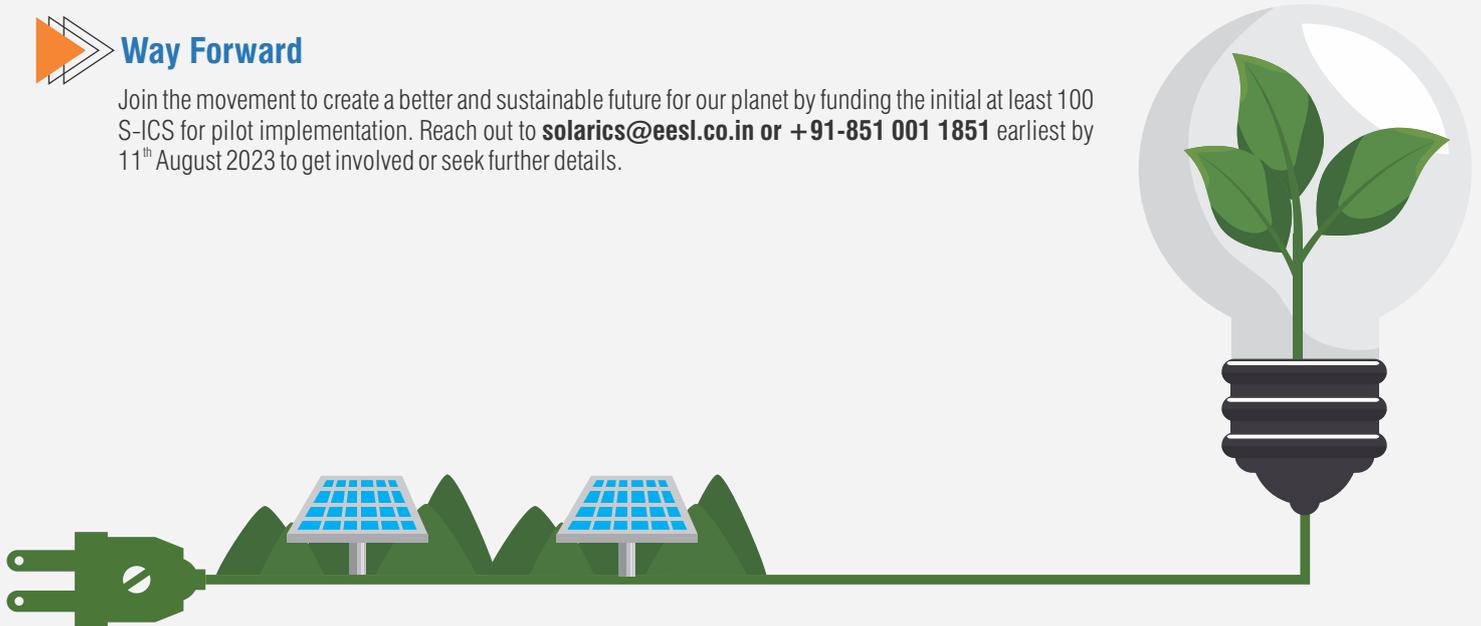
### Actual Program Implementation

Putting the strategic national level implementation plan (i.e. phase 1 and phase 2 implementation) into action to ensure it meets the program objectives.



### Way Forward

Join the movement to create a better and sustainable future for our planet by funding the initial at least 100 S-ICS for pilot implementation. Reach out to [solarics@eesl.co.in](mailto:solarics@eesl.co.in) or **+91-851 001 1851** earliest by 11<sup>th</sup> August 2023 to get involved or seek further details.



#### Notes:

<sup>1</sup> World Health Organization (WHO), 2020

<sup>2</sup> Multiple Indicator Survey in India, NSSO 78<sup>th</sup> Round, 2020-21

<sup>3</sup> Electric stoves as a solution for household air pollution: Evidence from rural India', ISI Delhi, 2022

<sup>4</sup> 'Household contributions to and impacts from air pollution in India', Nature Sustainability, 2021

<sup>5</sup> WHO, 2019