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Confederation of Indian Industry

The logo graphic features the text '3M-CII YOUNG INNOVATORS CHALLENGE' in a bold, black, sans-serif font. The text is partially enclosed by a red square frame. Behind the text are several overlapping circles in red and yellow, and a series of thin, concentric, wavy lines in grey and red that create a sense of motion and depth.

3M-CII  
YOUNG  
INNOVATORS  
CHALLENGE

A W A R D

SteamIT

Semi-Finalist 2018

## The Team



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## Mentors



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Waste Impact



# Elevator Pitch

- SteamIT is a portable dishwasher for street food vendors.
- Using pressurised steam, we can sanitize plates at food grade with a fraction of a glass of water.
- No more disposable plates littering the streets.



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# Innovation Rationale

- Bengaluru has over 1,00,000 street vendors selling food items or fruits and vegetables in our streets.
- High quality food trucks are gaining popularity, with over 200 unique food truck and bike experiences, many with several franchisees.
- Most considered establishments meet the gas/electrical requirements from their cooking setup.

Vendors sell food on disposable paper plates.

Plates are silver laminated and are not 100% biodegradable.

The plates are usually discarded on the roadsides with remaining food, and collected by pourakarmikas (BBMP street cleaners).



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# The Problem

**What?** An estimated 2 tonnes of non biodegradable silver foil laminate waste per day.

**Where?** The streets of Bangalore.

**Why?** Disposable plates.



# Current

## “Solutions”

- Dip washing plastic plates in a bucket.  
(ineffective removal of grease)
- A grease paper sheet on the plate to easily remove solid waste.

(paper

- Dispos (non bi



ed plates.



3M

# Concept of Innovation-**Ultraportable Hygiene**

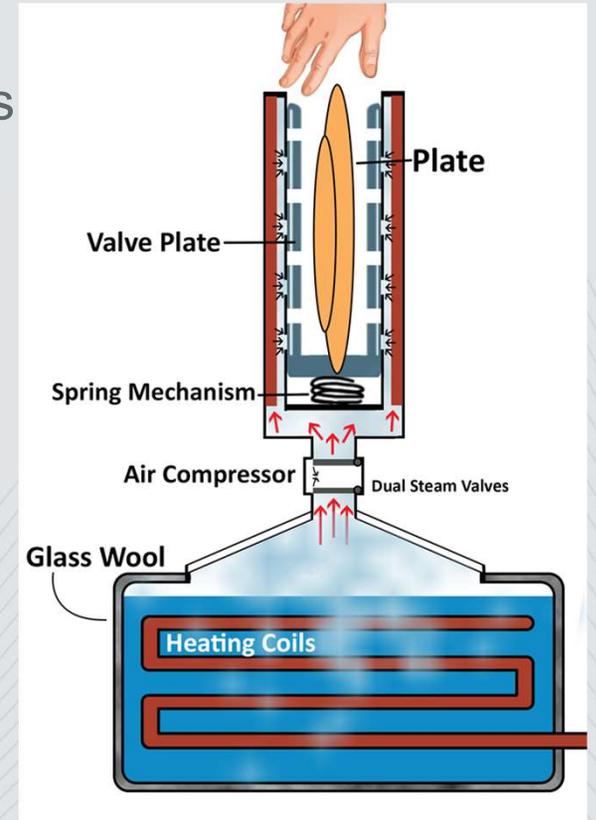
A portable steam based sanitization appliance for vendors

A street vendor can quickly cleanse a reusable plate before serving food.

Significantly reduced water usage by using steam.

High germ removal rates by hot steam at 175 degrees.

Solar cells are used to reduce dependence on the grid.



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# Concept of Innovation

## Heating of Materials

$$Q = m C_m \Delta T$$

$C_m$  – *specific heat capacity of the material*

	water	condensation	total
difference in temp (deg)	73		
mass (g)	240	240	
specific heat	4.184	2260	
energy required (J)	73303.68	542400	615703.68

## Phase Change of Materials

$$Q = m L_f \quad Q = m L_v$$

$L_f$  – latent heat of fusion (solid ↔ liquid)

$L_v$  – latent heat of vaporization (liq. ↔ gas)

constants	
electricity to heat of steamer	
heat to convert steam (per c	615703.68
water to steam volume scale	1700
volume of steam	408000
volume of cup	240
cups of steam per plate	250
no of plates	6.8
energy per plate	90544.65882
kWh per plate	0.02515149533
price per kWh (rs)	4
price per plate	0.1006059813

3M-CII  
**YOUNG  
INNOVATORS  
CHALLENGE**

**AWARD**

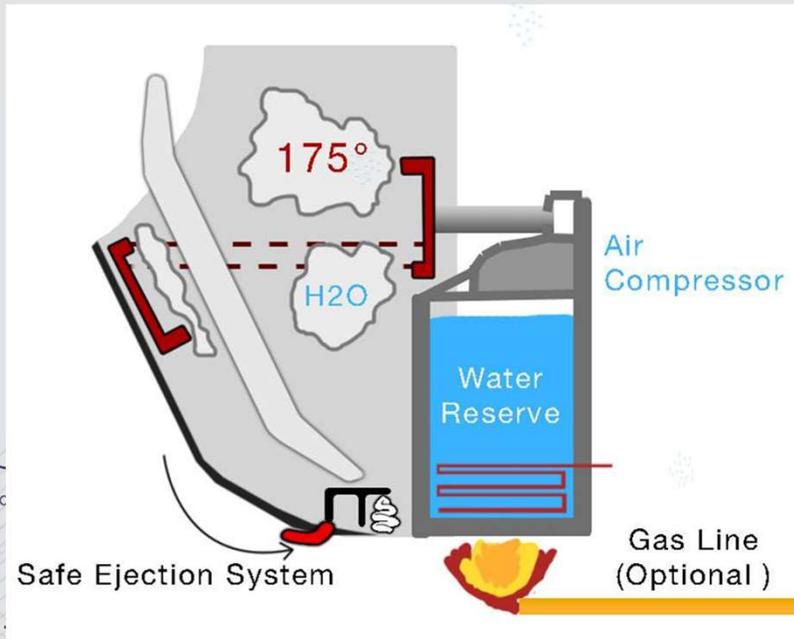
## Why Steam?

Steam cleaning kills 99.9 percent of bacteria, germs and dust mites. This includes E. coli, Staph bacteria, Salmonella and other microorganisms, surface molds, bacteria, viruses and various other germs caught from unclean street food.

At 175 degrees, pressurised steam can be used to sanitize plates quickly and effectively.

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# Prototyping



Works with both fossil fuel and electric coils. A portable handled form factor for smaller shops

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3M-CII  
**YOUNG**  
INNOVATORS  
CHALLENGE  
AWARD

## Slide 8

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- 1 add pics of your proto,your team at work  
manoj sanker, 6/16/2018

# Methodology

Significant savings for the food vendors who no longer require disposable plates.

The SteamIT washer is sold at a nominal price and the proprietary plates are the primary source of income.

A proprietary bioenzyme sachet is used to clean the device at nightly intervals.

We estimate that vendors will buy more plates as their business scales.



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# Measureable Impact

2  
3

**“We do not inherit the earth from our ancestors; we borrow it from our children”**

**India** is among the top four biggest plastic polluters in the world, responsible for around **60% of the 8.8 million tons** of plastic that is dumped into the ocean.

There are approximately **10 million street vendors in India**, and a vast majority of them serve food on single use cutlery.

**120 billion pieces** of plastic cutlery are disposed off in India annually.

By putting our device to use we could see a significant reduce in the use of single use cutlery therefore , reducing plastic waste manifold, stratifying **Swachh Bharat**.



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## Slide 10

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- 2      lets discuss this--typically should be number of tonnes of waste you will save in x years  
manoj sanker, 6/16/2018
- 3      add on Swachh bharath  
manoj sanker, 6/16/2018



## What's Next?

- We have performed swab tests on the outputs from our device, which gives supporting proof that plates are significantly cleaner than normal washing methods.
- We would use the grant money to develop five completely functional units and give them to street vendors ,get into pilot studies,hence enabling us to put the device to use in the actual scenarios to gather feedback and inputs to increase the efficiency and usability of the device

# Concluding Remarks

- 5 • We are trying to develop a self sustainable business model to keep us in business without much external support.
- Reducing plastic pollution is the need of the hour, and this contest would help us to get recognised in the ecosystem, thereby helping people take student ideas more seriously.



The 3M logo, consisting of the letters "3M" in a bold, red, sans-serif font, positioned over a yellow semi-circle.

## Slide 12

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- 5 its a need of the hour and contest will help you get recognised in the ecosystem and students will be taken more seriously  
manoj sanker, 6/16/2018
- 4 <http://www.3myounginnovatorschallenge.com/assessment-criteria/>  
manoj sanker, 6/16/2018