

# Menstrual Hygiene Management (MHM) Incinerator Market Landscape

Analysis of India and South Africa

The Sanitation Technology Platform (STeP) helps transformative solutions reach the 4.5 billion people worldwide who do not have access to safely managed sanitation. STeP provides a full range of services including field testing, market intelligence, and user insights to help inventors and industry develop products and services that address market and consumer needs.

STeP is a collaboration of global experts and organizations that removes risk and streamlines the path to market, fostering greater success for its partners. As a business unit within RTI International, Innovation Advisors is the implementing partner of STeP, a Bill & Melinda Gates Foundation platform.

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## About the Partners

The **Bill and Melinda Gates Foundation (BMGF)** supports the development of novel sanitation technologies poised for transformative impact through the Reinvent the Toilet Challenge (RTTC) and broad Water and Sanitation Sector support.

The **Sanitation Technology Platform (STeP)** is a collaboration of global experts and organizations that help transformative technologies reach people worldwide who don't have access to safe and affordable sanitation. We provide a full range of services—including field testing, market intelligence, and user insights—to de-risk and streamline the path to market and foster greater success for our partners.

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# Executive Summary

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# Market opportunity for MHM incinerators in India is >1M units per year and growing, with >50 suppliers in the market.



## Market Size for MHM Incinerators

- The MHM incinerator total market opportunity in India *is 1,371,890 units (in 2020)* and expected to grow at **3.84% compounded annual growth rate (CAGR)**.
- **Government** is projected as the **leading buyer (54%)** in 2020, but this is projected to flip to the **private sector (54%)** by 2030 as the private sector is growing faster than the government sector (in aggregate across segments analyzed).

## Key Market Segments for MHM Incinerators

- Combining quantitative and qualitative factors, **private sector-controlled schools + Higher Educational Institutions (HEIs)** (2.59% CAGR) and **offices** (5.64% CAGR) are the most promising market segments for MHM incinerators.
- **Incumbents** are primarily **focused on schools and HEIs**, making **private offices** an **interesting target market segment** for new MHM incinerator developers.

## Incumbent MHM Incinerators

- **Most (57 of 59)** identified MHM incinerator manufacturers **sell electric incinerators**, with typical **CapEx of \$400** and a processing **batch size of 10 pads/15 min**.
- **Sales focus on HEIs**, and **buyers prefer compact, electric, and smoke-free incinerators**.
- Two manufacturers sell **Liquified Petroleum Gas (LPG)-fired units**, with **CapEx of \$1,142** and a processing **batch size of 20 pads/15 min**. Electric competitors contribute to recent **sales decreases for LPG units**.

# MHM incinerators are not used in significant numbers in **South Africa**; market opportunity is around 100,000 units.



## Market Size for MHM Incinerators

- The MHM incinerator total market opportunity in South Africa is 95,266 units (in 2020) and expected to grow at **1.74% CAGR**.
- The **private sector** is projected to be the **leading buyer (68%)** in 2020, and this market share is projected to grow to **72% by 2030** if population trends continue in line with our projections.

## Key Market Segments for MHM Incinerators

- By volume, **private offices (31%)**, **private/government schools (21%/18%)**, and **government informal settlements (11%)** are the **largest potential market segments**.
- Interviews suggest **private schools** and **offices manage MHP disposal** well through provision and regular emptying of bins, **often by contractors at offices**.
- **Rural schools and settlements** need improved MHM, but incinerator fit is unclear.

## Incumbent MHM Incinerators

- **MHM incinerators are not common** in South Africa, and no local incumbent technologies were identified.
- **Indian manufacturers market** their MHM incinerators to South Africa, but **specific sales figures** to the country were **not identified**.

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Background

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# More than 24% of the world's population lacks access to improved sanitation, and over half of these are women.

Women and girls face **sanitation challenges that are unique to their gender**: they face barriers to accessing sanitation facilities due to **concerns of safety and privacy** and have increased need for sanitation facilities that reflect their **practical and physiologically-distinct sanitation needs**, especially during menstruation.<sup>1</sup>

**Menstruation is a time of heightened vulnerability for women**, during which cultural taboos contribute to the need for safe, private, and hygienic facilities for women to wash and clean in comfort.

Without provisions to support menstruating women, studies have indicated that **social restrictions have resulted in:**



**Increased school absenteeism**



**Negative health outcomes**, including urinary tract infections<sup>2</sup>

Improved sanitation access: [WHO/UNICEF Joint Monitoring Program, 2017](#).  
Over half women: [United Nations: The World's Women 2015: Trends and Statistics](#)

<sup>1</sup>Tilley et al. "Sanitation in developing countries: a review through a gender lens." *Journal of Water, Sanitation and Hygiene for Development* 3.3 (2013): 298-314.

<sup>2</sup>Sommer et al. "Overcoming the taboo: advancing the global agenda for menstrual hygiene management for schoolgirls." *American Journal Of Public Health* 103.9 (2013): 1556-1559.

# Appropriate disposal options for MHM products can improve the lives of women, girls, and their communities.

In places where menstruating women are stigmatized, seen as unclean, or separated from their households, **discrete disposal options for MHM products** (e.g., tampons, pads, cloths) **can decrease the public nature of menstruation and encourage a sense of privacy and comfort.**

**Safe and dignified MHM provisions** can thereby **drive toilet use and positively impact women, girls, and their communities.** In addition, a **lack of reliable solid waste management** is a nuisance that poses a **risk to public health** and **impedes reliable operation** of toilet infrastructure.

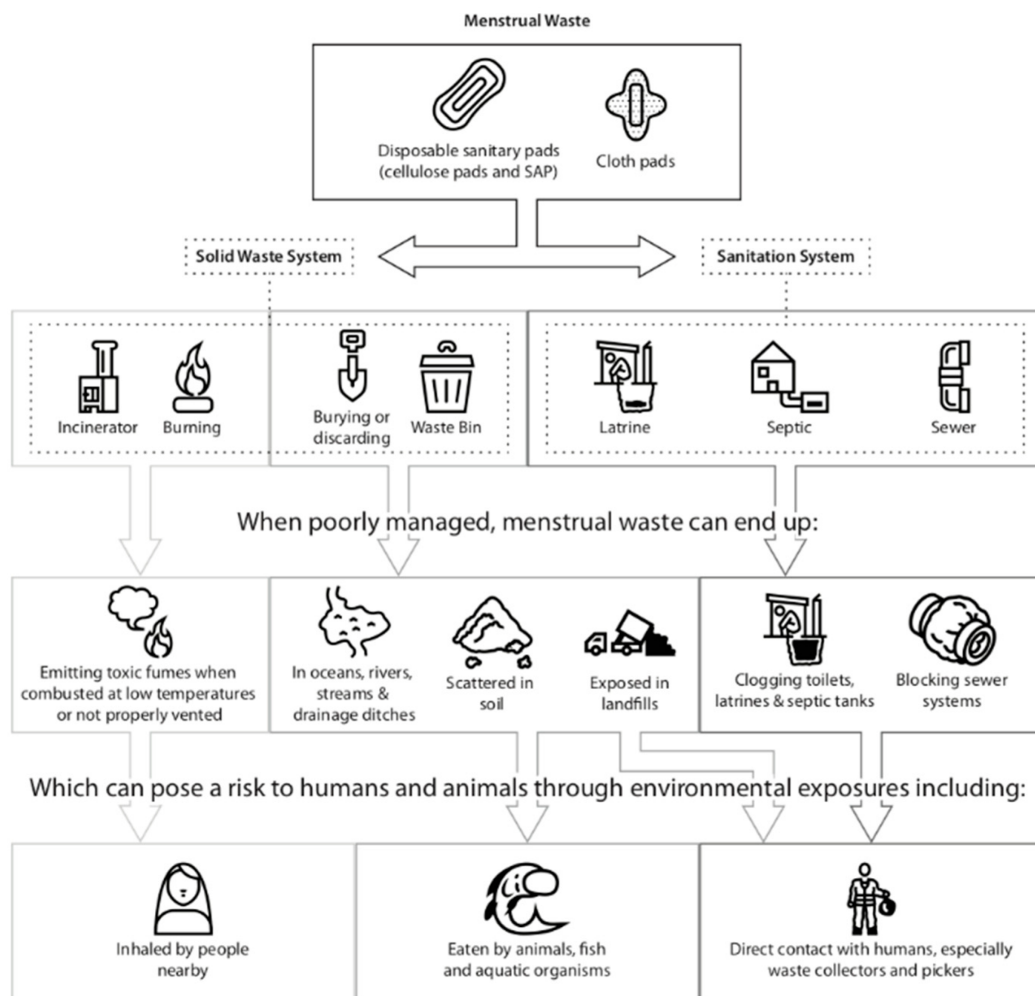


**CONTEXT  
MATTERS!**

**Women's disposal preferences and behaviors vary**, ranging from incineration, burying, and throwing MHM products in the public trash.

Given the **cultural sensitivities associated with menstruation**, it is important to **identify disposal options that fit women's preferences** to ensure that disposal technologies are used, and their **intended benefits—to safeguard against stigma and facilitate privacy and comfort for menstruating women—are realized.**

# When selecting an MHM disposal system, its impact on workers and the environment must also be considered.



## MHM Disposal Impact

Over an average woman's lifespan, 125-150<sup>1</sup> kgs of menstrual products will be used. Without appropriate, well-managed disposal avenues, this **waste may remain in communities, waterways, and landfills.**

The graphic to the left shows several **commonly observed disposal pathways** and highlights their **potential impact on sanitation workers and the environment.**

These **potential hazards should be considered by policy makers and companies** working to implement sustainable MHM disposal solutions, and mitigations against the hazards of poor management should be developed.

More information about these potential hazards is available in the source from Elledge et al. linked in the footer.

# The time is right to focus on improving MHM.

## Increasing Sanitary Pad Use

Use of sanitary pads is growing, particularly in India, and current solid waste management systems are not properly equipped to handle the increasing waste.

## Disposal Regulations

Expanded regulatory action on MHM at the State level in India is accelerating development of safe disposal guidelines and leading to new procurements for solids waste management solutions.

## Environmental Impact

Air emissions from MHM incinerators are not currently well monitored by equipment manufacturers, owners, or operators, but air emissions are receiving increased scrutiny in India across all market sectors.

## Incinerator Standards

The Bureau of Indian Standards is preparing draft standards for sanitary pads and small-scale incinerators that address both safe operation and environmental emissions.

# Focus of this Report

This report examines **MHM incinerators**, products designed for the decentralized incineration of menstrual hygiene products (MHPs). MHM incinerators are one of many options for the disposal of MHPs. They are the focus of this report due to their **quickly expanding presence** in the Indian market.

**India and South Africa** are the focus of this report due to their large sanitation needs and emerging strong commitment to address sanitation conditions.<sup>1</sup> This report aims to **provide MHM incinerator developers** targeting these countries **with information to inform** the development of **safe, appropriate, and sustainable MHM incinerator products**.

This report contains an overview of the **MHM incinerator market** in both countries—including the total market opportunity, key market segments, and the likelihood of key segments to adopt MHM incinerators. For India, the report also includes insights from **interviews with seven incumbent MHM incinerator** manufacturers. Incumbent product features, target markets, price points, sales channels, and after-sales servicing are discussed.

The report is **focused on decentralized MHM incinerators** and **does not include** discussion about the **relative advantages and disadvantages of incinerators compared to other MHM disposal methods**, such as the provision and regular emptying of disposal bins.

## This report IS...

- Designed to **inform companies about the market opportunity** for MHM incinerators.
- An estimation of the **total market size for MHM incinerators in India and South Africa**.
- A **source of insights from users, decision makers, and producers** of MHM incinerators in India.

## This report IS NOT...

- A **thorough background on the status of MHM in India or South Africa**.
- A **discussion of the relative advantages and disadvantages of incinerators compared with other options for MHM disposal**.
- A **comprehensive analysis of all incumbent MHM incinerator solutions available on the market**.

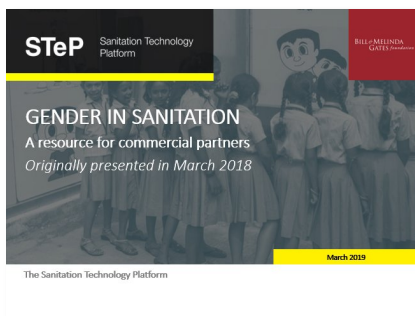
# Although this report focuses on incinerators, broader systems change is required to improve gender equity in sanitation.

This report focuses on MHM incinerators, one type of product available to improve MHM disposal. However, the narrow focus of the report should not be taken to imply that narrowly-focused solutions are sufficient for improving gender equity in sanitation.

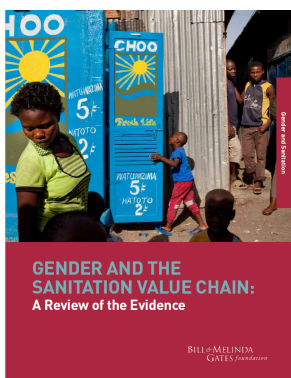
Although it is not the focus of this report, systems change is required to meaningfully improve gender equity in sanitation. MHM disposal is only one aspect of the sanitation value chain; systems change must be broader than a narrow focus on MHM disposal.

## *Additional resources to help inform system change strategies to improve gender equity in sanitation*

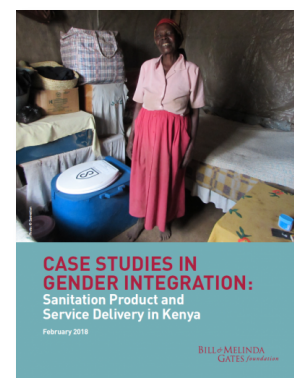
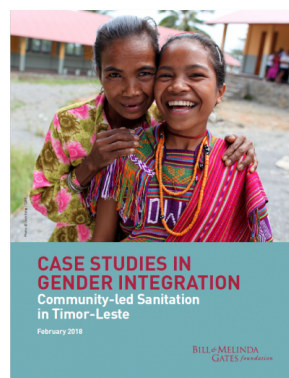
### Gender in Sanitation



### Gender and the Sanitation Value Chain



### Three Case Studies in Gender Integration



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# Market Sizing and Segmentation – Methodology

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# Richer information about Indian MHM incinerators allowed us to provide more detail in India than South Africa.

Same methods in both countries



## Market Segmentation and Sizing

### India AND South Africa

- Defined segments based on use-case and consumer type
- Sized segments through secondary research

More detailed approach in India, where more information is available



## Qualitative Market Segment Profiling

### India-specific

- User and decision maker interviews inform profiles of each market segment
- Secondary research provides incinerator adoption evidence

### South Africa-specific

- Interviews provide overviews of key segments



## Landscape of Incumbent MHM Incinerators

### India-specific

- Identified 59 incumbent MHM incinerators and interviewed 7
- Compiled insights related to technologies, markets, and customer feedback

### South Africa-specific

- No incumbent technologies identified

# We segmented the market in India and South Africa by ownership type and use-case.

- 21 market segments in India and 17 market segments in South Africa are analyzed.
- In each segment, the **population of menstruating females using disposable sanitary napkins** is estimated.
- The **population estimate is converted to MHM incinerator units** based on a set of assumptions **specific to each segment**.\*
- The market opportunity is **projected for 2020, 2025, and 2030** based on segment-specific trends.

| Market segments used for both India and South Africa |     |         |     |                             |
|------------------------------------------------------|-----|---------|-----|-----------------------------|
| Ownership Type                                       |     |         |     | Use-Case                    |
| Government                                           |     | Private |     |                             |
| India                                                | RSA | India   | RSA |                             |
|                                                      |     |         |     | Slums, Informal Settlements |
|                                                      |     |         |     | Railway Stations            |
|                                                      |     |         |     | Bus Terminals               |
|                                                      |     |         |     | International Airports      |
|                                                      |     |         |     | Domestic Airports           |
|                                                      |     |         |     | Tourist Destinations        |
|                                                      |     |         |     | Cinemas                     |
|                                                      |     |         |     | Offices                     |
|                                                      |     |         |     | Factories                   |
|                                                      |     |         |     | Hospitals                   |
|                                                      |     |         |     | Schools                     |
|                                                      |     |         |     | Colleges/Universities       |
|                                                      |     |         |     | Restaurants                 |
|                                                      |     |         |     | Malls                       |
|                                                      |     |         |     | Hotels                      |

|  |                          |
|--|--------------------------|
|  | Analyzed                 |
|  | Not included in analysis |

# Public and Community Toilets span multiple use cases and are underestimated in this market sizing approach.

- 6 use cases for public and community toilets are **included** in these market sizing estimates
- **Type 3** and **some Type 4** toilets are a viable potential market opportunity for MHM incinerators, but they are **excluded from market sizing** because number and placement are decided at the municipal level (no standards exist)
- **Type 5** toilets also represent a viable market opportunity for MHM incinerators, but they are **excluded from market sizing** because they are viewed as temporary installations

*Types of Public Toilets Defined for Cities in Andhra Pradesh<sup>1</sup>*

| Type of toilet/<br>nomenclature         | Use cases included<br>in this study's<br>market sizing                                  | Use cases omitted<br>from this study's<br>market sizing                      |
|-----------------------------------------|-----------------------------------------------------------------------------------------|------------------------------------------------------------------------------|
| Type 1 Transit<br>Area toilets          | Bus Terminals,<br>Railway Stations,<br>Airports                                         |                                                                              |
| Type 2<br>Institutional<br>Area Toilets | Hospitals,<br>Government<br>Offices, Religious<br>Places, Markets<br>(organized retail) | Markets<br>(temporary,<br>informal)                                          |
| Type 3 Public<br>Space Toilets          |                                                                                         | Parks,<br>Playgrounds,<br>Recreational<br>Areas, Bus Stops,<br>Parking Areas |
| Type 4<br>Community<br>Toilets          | Slums                                                                                   | Low Income<br>Areas, Residential<br>Areas                                    |
| Type 5 Event<br>Linked Toilets          |                                                                                         | Functions, Fairs,<br>Exhibitions                                             |

# Segment-specific assumptions drove the market size estimation in each segment.

Unique methods were developed for each segment to facilitate market size estimation. Key assumptions in each segment included:

- Urban and rural populations in the segment
- Age of the segment's female population\*
- Sanitary napkin utilization rate (varying for urban/rural settings)\*\*

*\*Age range varies by segment but is generally between 15 and 46. This may underrepresent the market opportunity by omitting some younger and older users.*

*\*\*We did not account for a difference in pad utilization rate by age, although at least one study suggests there is an age-related difference in India.<sup>1</sup>*

**Example:**  
Methods and sources for estimating the MHM incinerator market opportunity in government and private sector offices in India.

## Segment 9 (Govt.-Controlled) & 10 (Private controlled): Offices

$$\text{Total Demand} = \frac{A \times C \times D \times 10^6 \times B_j}{G} \times \sum_i E_i \times F_i$$

Where,

*A = Total workforce in service industry, in millions (Govt. of India Database)*

*C = % female population of India (Census 2011)*

*D = female population of India in 18-46 age group expressed as % female population of India in working age, i.e. 18-60 years (Census 2011)*

*i = rural or urban*

*j = govt. controlled or private controlled*

*B<sub>j</sub> = % workforce in service sector controlled by owner type 'j' (Govt. of India Database)*

*E<sub>i</sub> = % workforce in service sector in region 'i' (Govt. of India Database)*

*F<sub>i</sub> = % females using sanitary napkins in region 'i' (National Family Health Survey)*

*G = No. of females catered by each S.H.E. unit*

*Trend for variations in 'A', 'C', 'B<sub>j</sub>', 'D' and 'E<sub>i</sub>' are calculated*

# Indian market segments were characterized qualitatively for MHM incinerator fitment after interviews and research.

- Each market segment is characterized by **two key stakeholders, users** (who use MHM incinerators) **and decision makers** (who decide which incinerator, if any, to install).
- Interviews** with users and decision makers in each segment **informed STeP's grading** of key criteria for each segment.

| <i>Five criteria on which each stakeholder was evaluated</i>                                                             |                                                                                                                 |
|--------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| <i>Users</i>                                                                                                             | <i>Decision Makers</i>                                                                                          |
| 1. <b>Awareness of Sanitary Waste Management (SWM)</b>                                                                   | 1. <b>Priority for implementing MHM solutions</b>                                                               |
| 2. <b>Self-perceived decision maker influence</b> ; conviction of the user that their voice will be heard and acted upon | 2. <b>Influence on regulations and policies</b> on selection of the solution**                                  |
| 3. <b>Sensitivity to smoke and dust</b> emission during use*                                                             | 3. <b>Sensitivity to non-financial resource requirements</b> , like safety considerations and space limitations |
| 4. <b>Sensitivity to cost</b> per use                                                                                    | 4. <b>Sensitivity to financial resource requirement</b> (CapEx, OpEx)                                           |
| 5. <b>Sensitivity to social stigma</b> associated with public usage of solution                                          | 5. <b>Sensitivity towards socio-environment impact</b> of solution and impact on brand                          |

| <i>Grading system used to evaluate key stakeholders</i> |   |                                                                                                      |
|---------------------------------------------------------|---|------------------------------------------------------------------------------------------------------|
| <i>Grade</i>                                            |   | <i>Rationale</i>                                                                                     |
| Very High                                               | 5 | <b>Near unanimous</b> number of stakeholders <b>possess</b> the characteristic                       |
| High                                                    | 4 | <b>Most</b> stakeholders <b>possess</b> the characteristic                                           |
| Moderate                                                | 3 | Number of stakeholders possessing the characteristic <b>varies substantially across the segments</b> |
| Low                                                     | 2 | <b>Most</b> stakeholders <b>do not possess</b> the characteristic                                    |
| Very Low                                                | 1 | <b>Near unanimous</b> number of stakeholders <b>do not possess</b> the characteristic                |

\*As a near unanimous number of users across all segments are sensitive towards smoke and dust emission during usage, all market segments would get the same "very high" grading. Therefore, this characteristic was avoided while assigning comparative ranks to various segment.

\*\*Per Gas Cylinder Rules 2004 (Ministry of Petroleum and Natural Gas) the max storage for commercial use of LPG without license is 100 kg with one commercial cylinder unit weighing 19 kg. This influences the selection of the gas-based MHM incinerators in segments not usually licensed to store LPG.

# Interview results and secondary research informed market segment profiles for all 21 market segments in India.

- Segment profiles, such as the example shown below, provide qualitative scoring, evidence of incinerator utilization (when available), and projected segment size.
- The full set of segment profiles are found in the appendix ([go to appendix](#)).

## Example: Segment profile for the government schools segment.

### Segment 15: Schools (G)

- Demand at government schools is growing with a **CAGR of 2.29%**

| User                             |          | Decision Maker                                        |             |
|----------------------------------|----------|-------------------------------------------------------|-------------|
| Characteristic                   | Grading  | Characteristic                                        | Grading     |
| Awareness about the need for SWM | Low      | Priority for MHM Solutions                            | Moderate    |
| Influence on the decision maker  | Low      | Regulation- LPG Storage                               | Influential |
| Financial resource sensitivity   | Very Low | Financial resource sensitivity                        | Very High   |
|                                  |          | Non-financial resource sensitivity                    | Moderate    |
| Social stigma                    | Moderate | Socio-Environment sensitivity and Brand consciousness | Very Low    |

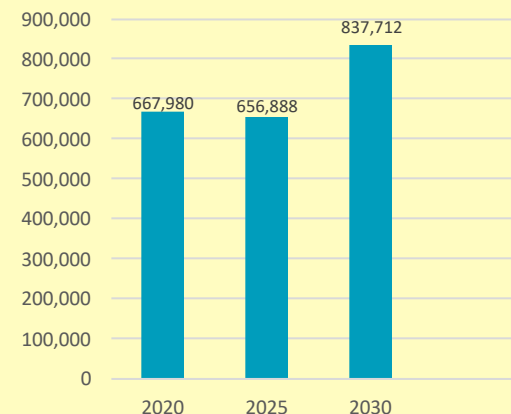
- Documented use of MHM incinerators in:

<sup>14</sup>Chennai government schools (1136 units installed)

<sup>15</sup>Private and government schools in Kerala (1845 units in private & govt schools planned)

<sup>16</sup>Government schools in Sabarkantha, Gujarat (number of units planned not mentioned)

Growth in demand at government schools



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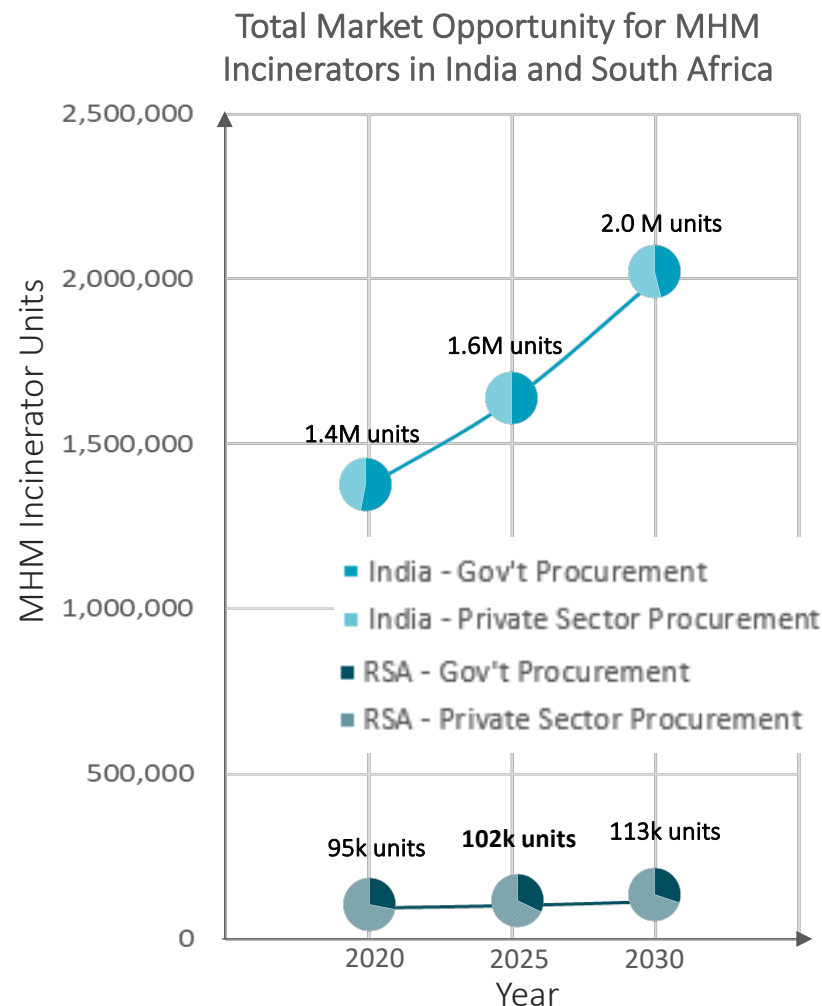
## Market Sizing and Segmentation – Findings

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# The total market opportunity for MHM incinerators is larger and growing faster in India compared to South Africa.

- In India, government is projected as the primary (54%) procurement pathway in 2020. This is **projected to flip** to the private sector (54%) in 2030 due to population trends observed in key segments, like offices and factories, where the private sector is growing faster than the government sector.
- In South Africa, the private sector is projected to dominate procurement (68–72% market share from 2020 to 2030).
- Higher projected growth rates in India are due to the combination of population growth trends and pad utilization rates.

| Country      | % of females using sanitary pads in |             |
|--------------|-------------------------------------|-------------|
|              | Urban areas                         | Rural areas |
| India        | 78%                                 | 48%         |
| South Africa | 71%                                 | 37%         |



# In both countries, offices are the largest potential market segment in 2020.

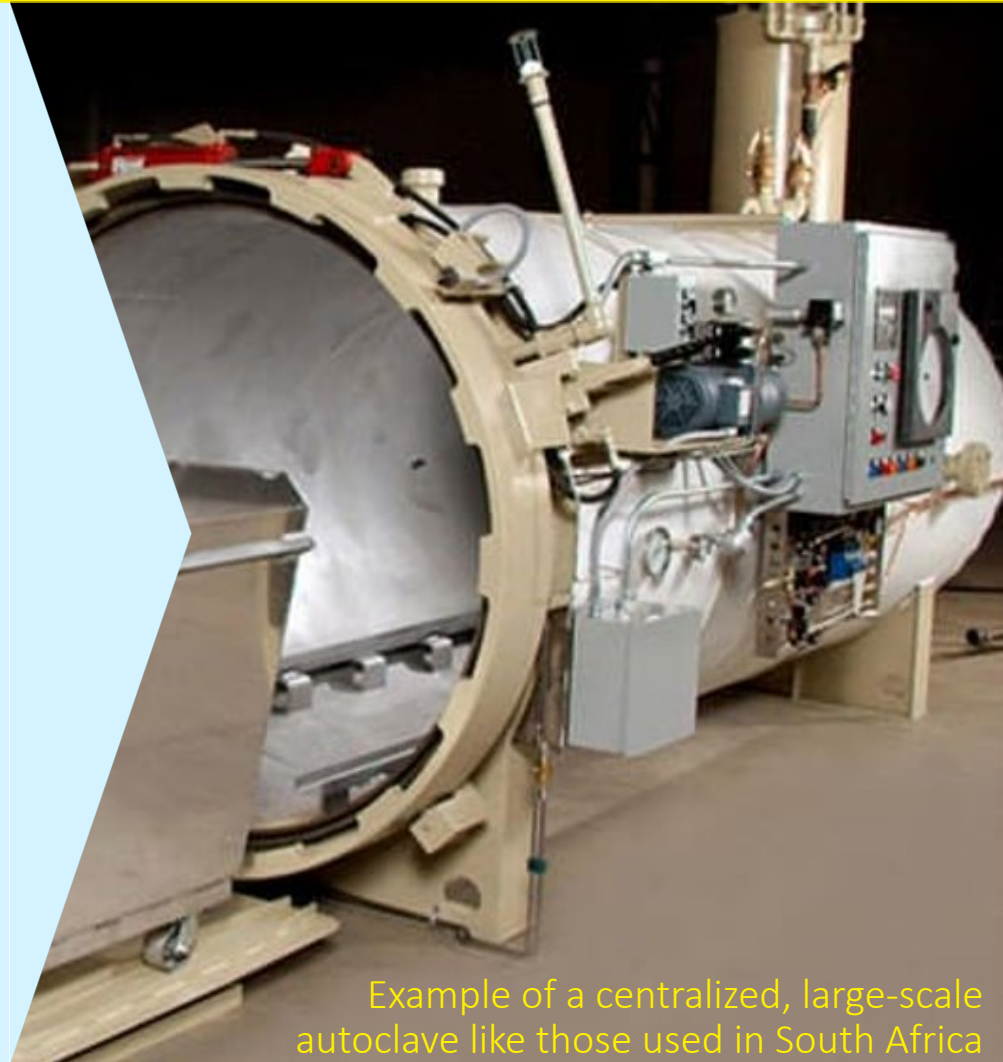
- Offices and schools are the only market segments to be ranked in the top four segments, in terms of total market opportunity size, for both countries.
- Full market opportunity estimates for each segment in 2020, 2025, and 2030 are available in the appendix.
  - [Jump to India appendix](#)
  - [Jump to South Africa appendix](#)

| MHM Incinerator Market Opportunity in 2020, India |              |              |                |
|---------------------------------------------------|--------------|--------------|----------------|
| Market Opportunity                                |              | Use-Case     | Procurement    |
| [units]                                           | [% of total] |              |                |
| 220,938                                           | 16%          | Offices      | Government     |
| 197,185                                           | 14%          | Factories    | Government     |
| 168,166                                           | 12%          | Offices      | Private Sector |
| 151,022                                           | 11%          | Factories    | Private Sector |
| 144,717                                           | 11%          | Schools      | Private Sector |
| 634,579                                           | 36%          | Other        | Mixed          |
| <b>1,371,890</b>                                  | <b>100%</b>  | <b>TOTAL</b> | <b>Mixed</b>   |

| MHM Incinerator Market Opportunity in 2020, South Africa |              |                      |                |
|----------------------------------------------------------|--------------|----------------------|----------------|
| Market Opportunity                                       |              | Use-Case             | Procurement    |
| [units]                                                  | [% of total] |                      |                |
| 29,999                                                   | 31%          | Offices              | Private Sector |
| 20,368                                                   | 21%          | Schools              | Private Sector |
| 17,417                                                   | 18%          | Schools              | Government     |
| 10,004                                                   | 11%          | Informal Settlements | Government     |
| 17,478                                                   | 18%          | Other                | Mixed          |
| <b>95,266</b>                                            | <b>100%</b>  | <b>TOTAL</b>         | <b>Mixed</b>   |

# In South Africa, there is little evidence of the adoption of decentralized MHM incinerators.

- Some Indian incinerator manufacturers **market** products to South Africa, but recorded **sales could not be confirmed**.
  - For example, Bangalore-based InnovoSoft Technologies claims they have supplied units to South Africa, Bhutan, Sri Lanka, and Philippines.
- **Healthcare waste** is often **autoclaved and shredded** in South Africa.
- Although we **cannot characterize the volume of autoclaved disposable MHPs** in South Africa, qualitative interviews suggest that facilities management firms serving **offices may also use autoclaving/shredding** for disposal of used MHPs.
  - Offices typically contract with waste management firms for bathroom maintenance.
  - The firms regularly collect waste, including used MHPs, and move them offsite for autoclaving and shredding.



Example of a centralized, large-scale autoclave like those used in South Africa

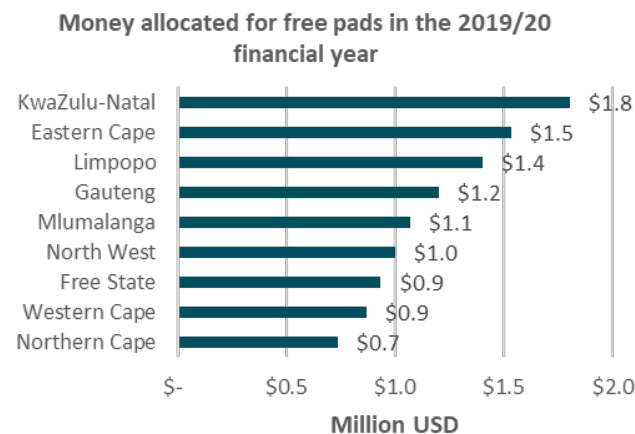
# In South Africa, recent government MHM efforts have focused on the provision of MHPs, especially in schools.

## Removal of 15% tax sanitary products

- As of **April 2019**, South Africa **removed the 15% tax** on sanitary pad and tampon sales across the country.<sup>1</sup>
- Per Finance Minister Tito Mboweni, the move “targets low-income households and restores the dignity of our people.”

## Free sanitary pads in poorer schools

- The **Department of Women’s Sanitary Dignity Program**, launched in April 2019<sup>2</sup>, coordinates the distribution of sanitary products to indigent girls and women.
- The program will increase pad access in schools, but **interviews suggest** some early **challenges** in the **storage and distribution** of pads.



<sup>1</sup>Adepoju, P. "African activists seek universal access to sanitary products." 2019. <https://www.devex.com/news/african-activists-seek-universal-access-to-sanitary-products-95248>

<sup>2</sup>Pilane, P. "#FreeToBleed: Zero-rating and free pads to start in South Africa." 2019. <https://health-e.org.za/2019/04/01/freetobleed-zero-rating-and-free-pads-to-start-in-south-africa/>

# New policies focused on disposal could expand the MHM incinerator market in rural schools and informal settlements.

Both rural schools and informal settlement housing face MHP disposal challenges, with pads ending up in latrines, making the removal of waste difficult. In contrast, interviews suggest urban schools and offices manage MHP disposal relatively well, although some used napkins are flushed.

A soon to be released study by the Water Research Commission in South Africa examined the impact of the provision and regular maintenance of bins (as well as other activities) to improve MHM at rural schools. The intervention was successful but plans to scale are not clear currently.



In India, a 2016 regulation change by the Ministry of Environment, Forest and Climate Change required manufacturers, brand owners, or marketing companies of sanitary napkins to, among other things:

- Provide necessary financial assistance to local authorities for the establishment of a waste management system
- Provide wrappers for used sanitary napkins
- Educate the public about the importance of safe disposal

If similar policies are enacted in South Africa, they could spur the adoption of MHM incinerators or competing solutions in those market segments with the most need, like rural schools and informal settlements.

In India, examples of demand already exist for MHM incinerators in some of the largest market segments.



### Offices & Airports

**3 units installed** at the Supreme Court of India, and **funds sanctioned for 288 units** at the Central Reserve Police Force. Additional units were installed in Western Railway Headquarters offices.

**3 units for government airports** tendered, at least **5 more units** have been installed at **private airports**.

### Public Schools & HEIs

**Government schools installed 1,136 units** in Chennai. **Plans to install** non-specific quantities at **1,069 schools** in Gujarat and **1,845 schools** in Kerala (combination of **public and private**) were announced.

**Government HEIs planned** units at 3 colleges.

### Private Schools & HEIs

**Private schools** installed units at **two locations** in Hyderabad.

**Private HEIs** installed at **least 1 unit** at schools in **Ranchi** and **Hyderabad** and announced plans for installing units at **300 inter colleges** in Uttar Pradesh.

# Interview results in India allow for a qualitative comparison of market segments' likelihood to adopt MHM incinerators.

- Market segments that do not currently store LPG on-site, like schools and offices, felt the fuel source (electric or gas) for an MHM incinerator would be influential in their procurement decision. As a result, to provide market insights to companies pursuing **both electrical and LPG-fired** incinerator development pathways, two different analyses were conducted:

Scoring method #1 accounts for the impact of gas regulation in segment scoring. In #1, the numerator is multiplied by 2 in segments where decision makers are not influenced by MHM incinerator fuel source during procurement. These segments are typically those already using LPG on-site for other purposes.

$$\text{\#1} = \frac{A \times B \times E \times I \times (1 \text{ or } 2 \text{ based on } F)}{C \times D \times G \times H}$$

In scoring method #2, the potential influence of MHM incinerator fuel source on procurement is not accounted for in the scoring process.

$$\text{\#2} = \frac{A \times B \times E \times I}{C \times D \times G \times H}$$

| Sector | User Criteria    |                             |                       |               | Decision Maker Criteria |                          |                       |                           |                   |
|--------|------------------|-----------------------------|-----------------------|---------------|-------------------------|--------------------------|-----------------------|---------------------------|-------------------|
|        | A                | B                           | C                     | D             | E                       | F                        | G                     | H                         | I                 |
|        | Awareness of SWM | Influence on Decision Maker | Financial Sensitivity | Social Stigma | Prioritizing MHM        | Regulation - Gas Storage | Financial Sensitivity | Non-financial Sensitivity | Socio-Env + Brand |

- In this analysis, **each criteria** was **weighted evenly** as shown above. In future analysis, the **relative weightings** of each criteria **could be tweaked** to prioritize certain factors, like financial sensitivity.

Most of the highest qualitatively-ranked segments are private sector, with government airports as the exception.

| Sector                     | User Criteria       |                                   |                          |                  | Decision Maker Criteria |                             |                          |                              |                      | #1                                     | #2                                   |
|----------------------------|---------------------|-----------------------------------|--------------------------|------------------|-------------------------|-----------------------------|--------------------------|------------------------------|----------------------|----------------------------------------|--------------------------------------|
|                            | A                   | B                                 | C                        | D                | E                       | F                           | G                        | H                            | I                    | Qual Score<br>(with LPG<br>multiplier) | Qual Score<br>(no LPG<br>multiplier) |
|                            | Awareness<br>of SWM | Influence on<br>Decision<br>Maker | Financial<br>Sensitivity | Social<br>Stigma | Prioritizing<br>MHM     | Regulation - Gas<br>Storage | Financial<br>Sensitivity | Non-financial<br>Sensitivity | Socio-Env +<br>Brand |                                        |                                      |
| Hotels (P)                 | Very High           | Very High                         | Very Low                 | Very Low         | Very High               | Non-influential             | Very Low                 | Low                          | Very High            | 625.0                                  | 312.5                                |
| International Airport (P)  | Very High           | High                              | Very Low                 | Very Low         | Very High               | Non-influential             | Very Low                 | Low                          | High                 | 400.0                                  | 200.0                                |
| Hospitals (P)              | High                | High                              | Very Low                 | Low              | Very High               | Non-influential             | Low                      | Moderate                     | Very High            | 66.7                                   | 33.3                                 |
| Offices (P)                | Very High           | Very High                         | Low                      | Very Low         | High                    | Influential                 | Very Low                 | High                         | High                 | 50.0                                   | 50.0                                 |
| International Airport (G)  | Very High           | Moderate                          | Very Low                 | Very Low         | High                    | Non-influential             | Very High                | Low                          | High                 | 48.0                                   | 24.0                                 |
| Colleges/ Universities (P) | High                | High                              | Very Low                 | Low              | High                    | Influential                 | Low                      | Low                          | High                 | 32.0                                   | 32.0                                 |
| Domestic Airport (G)       | Very High           | Moderate                          | Very Low                 | Low              | High                    | Non-influential             | Very High                | Low                          | High                 | 24.0                                   | 12.0                                 |
| Schools (P)                | High                | High                              | Very Low                 | Low              | High                    | Influential                 | Low                      | Moderate                     | High                 | 21.3                                   | 21.3                                 |
| Factories (P)              | Moderate            | High                              | Low                      | Moderate         | Moderate                | Non-influential             | Low                      | Low                          | Moderate             | 9.0                                    | 4.5                                  |
| Malls (P)                  | High                | High                              | Low                      | Low              | Moderate                | Influential                 | Low                      | High                         | High                 | 6.0                                    | 6.0                                  |
| Colleges/Universities (G)  | Very High           | High                              | Very Low                 | Low              | Moderate                | Influential                 | Very High                | Low                          | Low                  | 6.0                                    | 6.0                                  |
| Restaurants (P)            | Moderate            | High                              | Low                      | Low              | Moderate                | Influential                 | High                     | High                         | Moderate             | 1.7                                    | 1.7                                  |
| Offices (G)                | Moderate            | Moderate                          | Low                      | Low              | Moderate                | Influential                 | Very High                | Moderate                     | Moderate             | 1.4                                    | 1.4                                  |
| Hospitals (G)              | Low                 | Low                               | Very Low                 | High             | Very High               | Non-influential             | Very High                | Moderate                     | Low                  | 1.3                                    | 0.7                                  |
| Factories (G)              | Moderate            | Moderate                          | Low                      | Moderate         | Low                     | Non-influential             | Very High                | Low                          | Low                  | 1.2                                    | 0.6                                  |
| Cinemas (P)                | Moderate            | Moderate                          | Moderate                 | Low              | Low                     | Influential                 | Moderate                 | Moderate                     | Moderate             | 1.0                                    | 1.0                                  |
| Schools (G)                | Low                 | Low                               | Very Low                 | Moderate         | Moderate                | Influential                 | Very High                | Moderate                     | Very Low             | 0.3                                    | 0.3                                  |
| Tourist Destinations (G)   | Moderate            | Low                               | Moderate                 | High             | Low                     | Influential                 | Very High                | Moderate                     | Low                  | 0.1                                    | 0.1                                  |
| Bus Terminal (G)           | Moderate            | Very Low                          | High                     | High             | Low                     | Non-influential             | Very High                | Moderate                     | Very Low             | 0.1                                    | 0.0                                  |
| Railway Station (G)        | Moderate            | Very Low                          | High                     | High             | Low                     | Influential                 | Very High                | Moderate                     | Very Low             | 0.0                                    | 0.0                                  |
| Slums (G)                  | Low                 | Very Low                          | Very High                | High             | Very Low                | Influential                 | Very High                | Moderate                     | Very Low             | 0.0                                    | 0.0                                  |

## Of the highly-ranked qualitative segments, only private sector offices also led in the quantitative market size.

- Interviews suggest that **private offices** are starting to **follow the trend of government offices** ensuring safe sanitary waste disposal for staff by **installing MHM solutions** that adhere to laws and regulations.
- Initial discussions with **potential customers** and **incumbent technology providers** suggest **LPG usage at service sector offices is limited** and that they may **not wish to increase their LPG storage** to avoid legal processes with respect to LPG guidelines. Offices at more **industrial, manufacturing locations** are part of the “Factories” segment and may be **more open to LPG**.

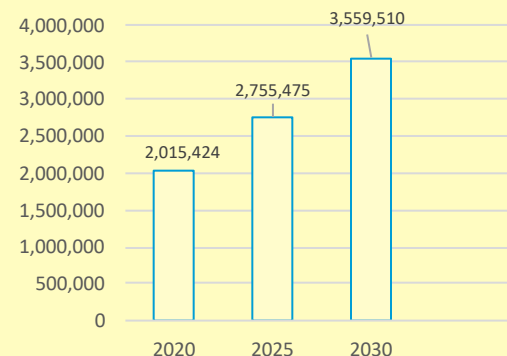
**Example:** Segment profiles for the private offices subsegment.

### Segment 10: Offices (P)

- The MHM incinerator demand at private offices is growing with a **CAGR of 5.85%***

| User                             |           | Decision Maker                                        |             |
|----------------------------------|-----------|-------------------------------------------------------|-------------|
| Characteristic                   | Grading   | Characteristic                                        | Grading     |
| Awareness about the need for SWM | Very High | Priority for MHM Solutions                            | High        |
| Influence on the decision maker  | Very High | Regulation- LPG Storage                               | Influential |
| Financial resource sensitivity   | Low       | Financial resource sensitivity                        | Very Low    |
|                                  |           | Non-financial resource sensitivity                    | High        |
| Social stigma                    | Very Low  | Socio-Environment sensitivity and Brand consciousness | High        |

**Growth in demand at private offices**



# Considering the size of market segments in the context of their qualitative ranking can inform market entry strategy.

Only relatively small MHM incinerator segments use LPG today

- Of the 9 segments we categorized as “not likely to be influenced by LPG” during MHM incinerator procurement, all ranked in the bottom half of quantitative market size.
- These segments include hospitals and airports, where MHM incinerators have already been installed.

Private sector may drive the MHM incinerator opportunity in schools

- Public and private schools and HEIs all rank highly in the quantitative market assessment, but a 50/50 weighting of qualitative/quantitative rankings places **only private** schools and HEIs in the top five most attractive segments.
- This trend is **driven in part** by private sector schools and HEIs appearing to be less price sensitive.

[See the appendix](#) for the top-five segments that result from combining the relative weight of quantitative market segment sizes and qualitative evaluations at weightings of: 25/75, 50/50, and 75/25.

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## Landscape of Incumbent MHM Incinerators – India

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# STeP interviewed 7 of the 59 companies identified as selling MHM incinerators in India.

- STeP reached out to all 59 companies and **interviewed the 7 companies that responded** to requests for interviews.
- **Most** of the firms produce **electricity-fueled** incinerators, with **two** producing LPG-fueled units.
- **Most** of the companies are small, with less than \$1M in annual self-reported revenues (India Mart).
- Of the companies identified, **65% were formed in or after 2010.**

*Focus categories for interview with incumbents*



*Note: STeP has not attempted to validate statements made by incumbent manufacturers during interviews, and the limited sample size (7 of 59 identified manufacturers) means responses are not necessarily generalizable across the market.*

# Interview responses allowed for an initial understanding of the relative position of these companies in the market.

- HEIs are the **dominant customer segment** across firms that responded, **followed by offices**.
- **Average cost** for an **electric MHM incinerator** with processing capacity <100 pads/hour was **~\$265**.
- One manufacturer of gas incinerators responded (MKR Enterprise), but their system is a larger-scale unit better suited to centralized waste incineration (e.g. at a hospital) than to deployment in bathrooms.
- **Patents were not common** in the space, with only Sowbal Aerothermics associated with a patent application from 2018.

*Overview of interviewed MHM incinerator producers*

| Fuel Type | MHM incinerator producer          | Founding year | Annual revenue*** | Annual sales | Capacity for mean MHM incinerator models | Capex for mean MHM incinerator | Market segment addressed                     | CAGR of units sold |
|-----------|-----------------------------------|---------------|-------------------|--------------|------------------------------------------|--------------------------------|----------------------------------------------|--------------------|
|           | [ ]                               | [ ]           | [USD]             | [units]      | [pads/hour]                              | [USD/unit]                     | [%]                                          | [%]                |
| Electric  | Bharti Sales                      | 2011          | ~\$190,000        | 750          | 10                                       | \$257                          | HEIs – 75%<br>Offices – 25%                  | 109%               |
|           | The Indo Medical Healthcare       | 2015          | ~\$100,000        | 800          | 10                                       | \$128                          | HEIs – 80%<br>Offices – 20%                  | 281%               |
|           | Sara Equipment                    | 2013          | ~\$290,000        | 1200         | 10                                       | \$243                          | HEIs – 75%<br>Offices – 25%                  | 226%               |
|           | Sowbal Aerothermics               | 2018          | ~\$62,000         | 150          | 40                                       | \$414                          | HEIs – 89%<br>Hospitals – 3%<br>Offices – 8% | 1125%              |
|           | Rashitech Vending Systems Limited | 2005          | ~\$450,000        | 1,500        | 100                                      | \$297                          | HEIs – 95%<br>Offices – 5%                   | 63%                |
|           | Zuci Fem Care Solutions*          | 2017          | ~\$4,700,000      | 2,000        | 1,500                                    | \$2,371**                      | HEIs – 100%                                  | 1160%              |
| Gas       | MKR Enterprise*                   | 1994          | ~\$7,000          | 6            | 80                                       | \$1,142**                      | HEIs – 90%<br>Offices – 10%                  | 7%                 |

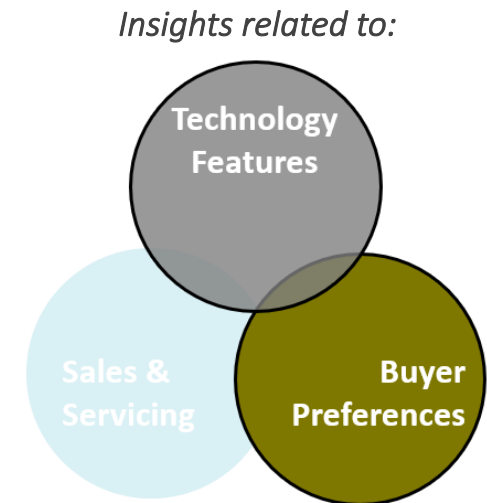
\*These two companies registered their products with the Pollution Control Board (PCB)

\*\*Excluded from average cost calculation due to high processing capacity or large size better suited to deployment as a centralized incinerator rather than in-bathroom installation.

\*\*\*Converted from INR at 70:1 INR:USD. Revenue numbers are based on company claims during interviews. They could not be independently verified. Interviews suggest a significant number of sales may occur in unrecorded cash payments.

# In interviews, incumbents said their customers prefer smoke-free, small-footprint, and low-cost incinerators.

- **Smoke-free operation** is claimed as standard.
  - Customers value this feature as it **ensures a clean operating environment** (especially in premium segments like offices) and **reduces the triggering of fire alarms**.
  - Multiple manufacturers reported **slum dwellers poured water on MHM incinerators when they saw smoke** coming from the machine, rendering the unit dysfunctional and beyond repair.
- Customers value **compactness over processing capacity**.
  - Incumbents' **customers install products indoors**, where **space comes at a premium**. This has led to a push towards compact designs as small as Sowbal Aerothermics' 2.5kg hanging unit.
- **Lower-cost units** are preferred.
  - Incumbents stated electric incinerators are currently lower cost.
  - MKR Enterprises has made a large, LPG-fired incinerator since 1994. Their sales volume has been **shrinking by double digits year-over-year** since electric incinerators hit the market at half the price in 2014-2015, **forcing them to diversify** their business to segments where larger and more expensive units are used for **community/industrial scale operation** and LPG is more common.



# Incumbents are planning innovations in emission control, remote monitoring, and feedstock expansion.

## Sowbal Aerothermics

- Experimenting with self monitoring and temperature regulation systems for their future incinerators.

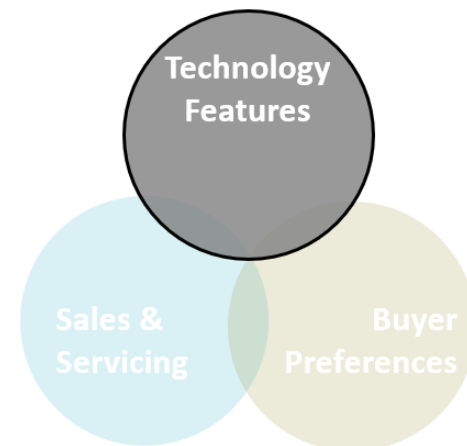
## Rashitech Vending Systems Limited

- Working to add a **filtration** system to their incinerators to **further minimize emissions**.
- Also experimenting with features like self-timers.

## Zuci Fem Care Solutions

- Working on incinerator machines that can **process sanitary napkins and diapers** at the same time.

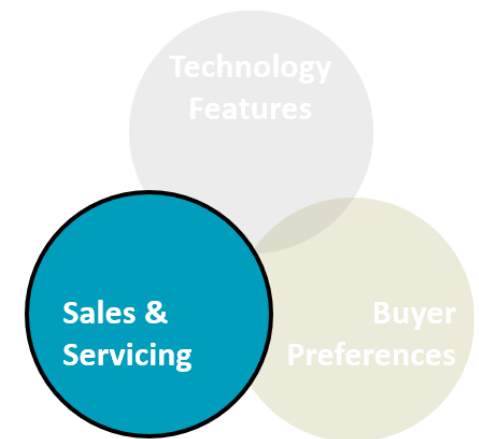
*Insights related to:*



# Incumbents sell through multiple channels without offering financing and typically outsource after-sales support.

- Sales are made through a combination of **online sales platforms** and **brick-and-mortar** distribution chains.
  - Financing or licensing options were not offered by interviewed firms, who believed the upfront payments were not prohibitive for their customers
- **12-month warranties** offering comprehensive coverage are **typical**.
- **3rd-party technicians perform after-sales service**, with calls typically managed by an outsourced helpdesk.
  - Growth in the white goods sector has allowed small, after-sales technical service companies to proliferate, **removing the need for in-house maintenance personnel**.
  - Incumbents **contract these companies, train them** to conduct **product-specific repairs**, and **pay** them on a **per-repair-call basis** during the warranty period.

*Insights related to:*





STeP accelerates innovations in sanitation by connecting partners, facilitating field testing, and supporting commercialization.

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## Appendix A – India Market Sizing

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# Assumptions were made to convert from population to MHM incinerator units.

- We quantified the number of women in the 13–46 age bracket and using “disposable” sanitary napkins as target customers.
- We converted this population to number of MHM incinerator units in each market segment with the equation below, which includes key assumptions about the MHM incinerator unit specifications, menstruating women in India, and time spent in each segment.

$$\text{Assumed number of females catered by MHM incinerator unit} = \sqrt{\frac{30 \times A \times B \times \eta}{C \times D \times E_i}}$$

Where,

$A$  = No. of sanitary napkins incinerated per batch by each MHM incinerator unit = 25

$B$  = Maximum no. of operational batches per day per MHM incinerator unit = 48 (considering a 30-minute batch time)

$C$  = Average length of periods in India, in days per month per female = 4.77 days

$D$  = Average per female daily requirement of sanitary napkins during periods in India = 2.29

$E_i$  = % hours per day spent by a person at ‘ $i$ ’ (Estimated for each segment separately)

$\eta$  = Capacity Utilization Factor for MHM incinerator = 80% (estimated at 80% assuming for preventive maintenance and other down times)

# Total market opportunity for MHM incinerators in India is shown in order of largest 2030 demand.

| Sr No. | Sector<br>(G=Government, P=Private)      | Demand           |                  |                  | CAGR         |
|--------|------------------------------------------|------------------|------------------|------------------|--------------|
|        |                                          | 2020             | 2025             | 2030             |              |
| 11     | Factories (G)                            | 197,185          | 269,334          | 349,230          | 5.88%        |
| 10     | Offices (P)                              | 168,166          | 229,025          | 291,107          | 5.64%        |
| 12     | Factories (P)                            | 151,022          | 210,838          | 314,380          | 7.61%        |
| 9      | Offices (G)                              | 220,938          | 203,231          | 175,136          | -2.30%       |
| 16     | Schools (P)                              | 144,717          | 145,398          | 183,473          | 2.40%        |
| 1      | Slums (G)                                | 142,196          | 158,001          | 176,020          | 2.16%        |
| 18     | Colleges/Universities (P)                | 131,186          | 156,250          | 173,204          | 2.82%        |
| 15     | Schools (G)                              | 88,546           | 88,963           | 112,260          | 2.40%        |
| 19     | Restaurants (P)                          | 26,079           | 45,212           | 77,473           | 11.50%       |
| 2      | Railway Station (G)                      | 21,075           | 38,567           | 42,858           | 7.36%        |
| 17     | Colleges/Universities (G)                | 33,883           | 32,578           | 29,152           | -1.49%       |
| 13     | Hospitals (G)                            | 23,767           | 26,093           | 31,632           | 2.90%        |
| 14     | Hospitals (P)                            | 11,561           | 13,189           | 17,191           | 4.05%        |
| 20     | Malls (P)                                | 4,668            | 7,669            | 12,479           | 10.33%       |
| 6      | Domestic Airport (G)                     | 1,838            | 3,758            | 7,609            | 15.27%       |
| 3      | Bus Terminal (G)                         | 3,000            | 3,355            | 3,677            | 2.06%        |
| 8      | Cinemas (P)                              | 1,107            | 1,085            | 1,073            | -0.31%       |
| 21     | Hotels (P)                               | 369              | 435              | 500              | 3.08%        |
| 4      | International Airport (G)                | 325              | 461              | 632              | 6.88%        |
| 7      | Tourist Destinations (G)                 | 148              | 174              | 202              | 3.16%        |
| 5      | International Airport (P)                | 114              | 162              | 221              | 6.84%        |
|        | <b>MHM Incinerator Demand</b>            | <b>1,371,890</b> | <b>1,633,778</b> | <b>1,999,509</b> | <b>3.84%</b> |
|        | MHM Incinerator Demand (Govt. ownership) | 732,901          | 824,515          | 928,408          | 2.39%        |
|        | MHM Incinerator (Pvt. ownership)         | 638,989          | 809,263          | 1,071,101        | 5.30%        |

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## Appendix B – South African Market Sizing

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# Assumptions were made to convert from population to MHM incinerator units.

- We quantified the number of women in 13–46 age bracket and using “disposable” sanitary napkins as target customers.
- We converted this population to number of MHM incinerator units in each market segment with the equation below, which includes key assumptions about MHM incinerator unit specifications, menstruating women in India, and time spent in each segment.

$$\text{No. of females catered by each S.H.E. unit} = \sqrt{\frac{30 \times A \times B \times \eta}{C \times D \times E_i}}$$

Where,

A = No. of sanitary napkins incinerated per batch by each MHM incinerator unit = 25

B = Maximum no. of operational batches per day per MHM incinerator unit = 48 (considering a 30-minute batch time)

C = Average length of periods in India, in days per month per female = 4.77 days

D = Average per female daily requirement of sanitary napkins during periods in South Africa = 2.06

E<sub>i</sub> = % hours per day spent by a person at 'i' (Estimated for each segment separately)

η = Capacity Utilization Factor for MHM incinerator = 80% (estimated at 80% assuming for preventive maintenance and other down times)

Not specific to  
South Africa

# Total market opportunity for MHM incinerators in South Africa in order of largest 2030 demand.

| Sr No. | Sector                                   | Demand        |                |                | CAGR         |
|--------|------------------------------------------|---------------|----------------|----------------|--------------|
|        |                                          | 2020          | 2025           | 2030           |              |
| 7      | Offices (P)                              | 29,999        | 33,123         | 38,842         | 2.62%        |
| 11     | Schools (P)                              | 20,368        | 21,519         | 23,708         | 1.53%        |
| 12     | Schools (G)                              | 17,417        | 18,401         | 20,273         | 1.53%        |
| 1      | Informal Settlements (G)                 | 10,004        | 9,279          | 8,274          | -1.88%       |
| 17     | Malls (P)                                | 5,956         | 7,556          | 8,487          | 3.60%        |
| 13     | HEIs (G)                                 | 5,354         | 5,813          | 6,671          | 2.22%        |
| 6      | Factories (P)                            | 2,701         | 2,801          | 3,101          | 1.39%        |
| 14     | HEIs (P)                                 | 2,025         | 2,198          | 2,523          | 2.22%        |
| 15     | Railway Stations (G)                     | 788           | 746            | 680            | -1.46%       |
| 9      | Hospitals (P)                            | 168           | 198            | 224            | 2.92%        |
| 16     | Hotels (P)                               | 135           | 142            | 142            | 0.51%        |
| 10     | Hospitals (G)                            | 129           | 114            | 97             | -2.81%       |
| 3      | Domestic Airports (G)                    | 80            | 79             | 74             | -0.78%       |
| 2      | International Airports (G)               | 65            | 63             | 58             | -1.13%       |
| 5      | Tourism (G)                              | 41            | 45             | 46             | 1.16%        |
| 4      | Regional Airports (G)                    | 33            | 33             | 33             | 0.00%        |
| 8      | Cinema (P)                               | 3             | 3              | 2              | -3.97%       |
|        | <b>MHM Incinerator Demand</b>            | <b>95,266</b> | <b>102,113</b> | <b>113,235</b> | <b>1.74%</b> |
|        | MHM Incinerator Demand (Govt. Ownership) | 33,911        | 34,573         | 36,206         | 0.66%        |
|        | MHM Incinerator Demand (Pvt. Ownership)  | 61,355        | 67,540         | 77,029         | 2.30%        |

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## Appendix C – India Market Segment Profiles

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# Profiling Market Segments

## Other Segments

### Segment 1: Slums (G)

- The MHM incinerator demand at slums is growing with a **CAGR of 2.16%**

| User                             |           | Decision Maker                                        |             |
|----------------------------------|-----------|-------------------------------------------------------|-------------|
| Characteristic                   | Grading   | Characteristic                                        | Grading     |
| Awareness about the need for SWM | Low       | Priority for MHM Solutions                            | Very Low    |
| Influence on the decision maker  | Very Low  | Regulation- LPG Storage                               | Influential |
| Financial resource sensitivity   | Very High | Financial resource sensitivity                        | Very High   |
|                                  |           | Non-financial resource sensitivity                    | Moderate    |
| Social stigma                    | High      | Socio-Environment sensitivity and Brand consciousness | Very Low    |

- Documented use of MHM incinerators in:  
<sup>1</sup>Mumbai slums at Mankhurd and Bhandup (1 unit at each slum installed)

Growth in MHM incinerator demand at slums



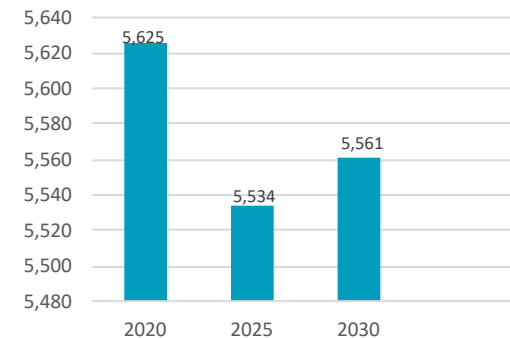
### Segment 2: Cinemas (P)

- The MHM incinerator demand at cinemas is growing with a **CAGR of -0.11%**

| User                             |          | Decision Maker                                        |             |
|----------------------------------|----------|-------------------------------------------------------|-------------|
| Characteristic                   | Grading  | Characteristic                                        | Grading     |
| Awareness about the need for SWM | Moderate | Priority for MHM Solutions                            | Low         |
| Influence on the decision maker  | Moderate | Regulation- LPG Storage                               | Influential |
| Financial resource sensitivity   | Moderate | Financial resource sensitivity                        | Moderate    |
|                                  |          | Non-financial resource sensitivity                    | Moderate    |
| Social stigma                    | Low      | Socio-Environment sensitivity and Brand consciousness | Moderate    |

- No documented use of MHM incinerators

Growth in MHM incinerator demand at cinemas



# Profiling Market Segments

## Other Segments

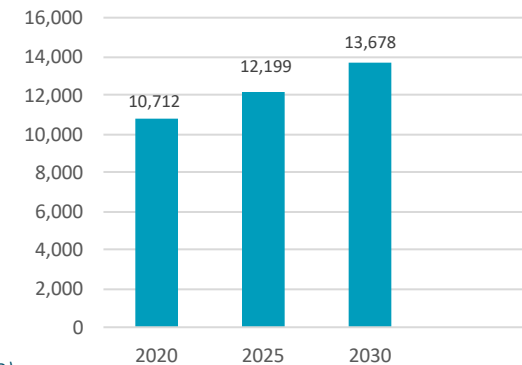
### Segment 3: Railway Stations (G)

- The MHM incinerator demand at railway stations is growing with a CAGR of 2.47%

| User                             |          | Decision Maker                                        |             |
|----------------------------------|----------|-------------------------------------------------------|-------------|
| Characteristic                   | Grading  | Characteristic                                        | Grading     |
| Awareness about the need for SWM | Moderate | Priority for MHM Solutions                            | Low         |
| Influence on the decision maker  | Very Low | Regulation- LPG Storage                               | Influential |
| Financial resource sensitivity   | High     | Financial resource sensitivity                        | Very High   |
|                                  |          | Non-financial resource sensitivity                    | Moderate    |
| Social stigma                    | High     | Socio-Environment sensitivity and Brand consciousness | Very Low    |

- Documented use of MHM incinerators in:
  - <sup>2</sup>Chennai Central railway station (1 unit installed)
  - <sup>3</sup>New Delhi & Bhopal Railway Junction (number of units installed not mentioned)
  - <sup>3</sup>200 Major railway stations (number of units not mentioned; installation was planned by 8 March 2018)

Growth in MHM incinerator demand at railway stations



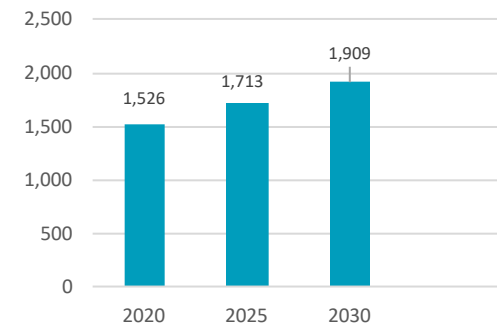
### Segment 4: Bus Terminals (G)

- The MHM incinerator demand at bus terminals is growing with a CAGR of 2.26%

| User                             |          | Decision Maker                                        |                 |
|----------------------------------|----------|-------------------------------------------------------|-----------------|
| Characteristic                   | Grading  | Characteristic                                        | Grading         |
| Awareness about the need for SWM | Moderate | Priority for MHM Solutions                            | Low             |
| Influence on the decision maker  | Very Low | Regulation- LPG Storage                               | Non-influential |
| Financial resource sensitivity   | High     | Financial resource sensitivity                        | Very High       |
|                                  |          | Non-financial resource sensitivity                    | Moderate        |
| Social stigma                    | High     | Socio-Environment sensitivity and Brand consciousness | Very Low        |

- No documented use of MHM incinerators

Growth in MHM incinerator demand at bus terminals



# Profiling Market Segments

## Other Segments

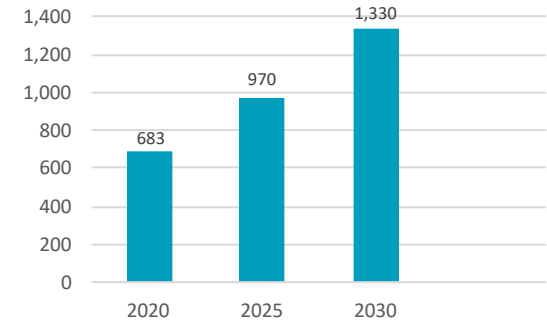
### Segment 5: International Airports (P)

- The MHM incinerator demand at private controlled International Airports is growing with a CAGR of 6.89%

| User                             |           | Decision Maker                                        |                 |
|----------------------------------|-----------|-------------------------------------------------------|-----------------|
| Characteristic                   | Grading   | Characteristic                                        | Grading         |
| Awareness about the need for SWM | Very High | Priority for MHM Solutions                            | Very High       |
| Influence on the decision maker  | High      | Regulation- LPG Storage                               | Non-influential |
| Financial resource sensitivity   | Very Low  | Financial resource sensitivity                        | Very Low        |
|                                  |           | Non-financial resource sensitivity                    | Low             |
| Social stigma                    | Very Low  | Socio-Environment sensitivity and Brand consciousness | High            |

- Documented use of MHM incinerators in:
  - <sup>4</sup>Hyderabad International Airport (1 unit installed)
  - <sup>5</sup>Chandigarh International Airport (4 units installed)

Growth in MHM incinerator demand at international airports (private)



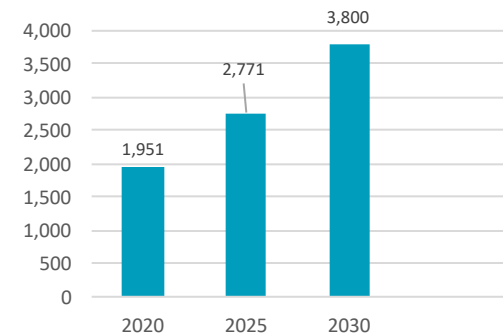
### Segment 6: International Airports (G)

- The MHM incinerator demand at govt.-controlled International Airports is growing with a CAGR of 6.89%

| User                             |           | Decision Maker                                        |                 |
|----------------------------------|-----------|-------------------------------------------------------|-----------------|
| Characteristic                   | Grading   | Characteristic                                        | Grading         |
| Awareness about the need for SWM | Very High | Priority for MHM Solutions                            | High            |
| Influence on the decision maker  | Moderate  | Regulation- LPG Storage                               | Non-influential |
| Financial resource sensitivity   | Very Low  | Financial resource sensitivity                        | Very High       |
|                                  |           | Non-financial resource sensitivity                    | Low             |
| Social stigma                    | Very Low  | Socio-Environment sensitivity and Brand consciousness | High            |

- Documented use of MHM incinerators in:
  - <sup>6</sup>Madurai International Airport (1 unit tender floated by Airports Authority of India)
  - <sup>7</sup>Trichy International Airport (1 unit tender floated by Airports Authority of India)

Growth in MHM incinerator demand at international airports (under government)



# Profiling Market Segments

## Other Segments

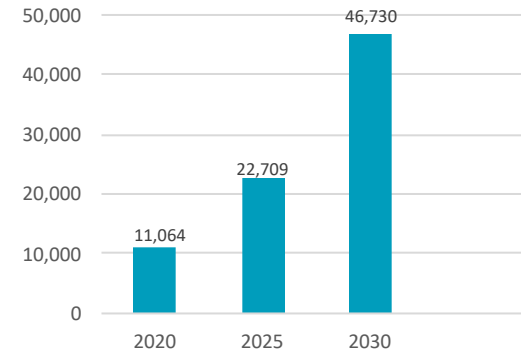
### Segment 7: Domestic Airports (G)

- The MHM incinerator demand at International Airports (under AAI) is growing with a **CAGR of 15.5%**

| User                             |           | Decision Maker                                        |                 |
|----------------------------------|-----------|-------------------------------------------------------|-----------------|
| Characteristic                   | Grading   | Characteristic                                        | Grading         |
| Awareness about the need for SWM | Very High | Priority for MHM Solutions                            | High            |
| Influence on the decision maker  | Moderate  | Regulation- LPG Storage                               | Non-influential |
| Financial resource sensitivity   | Very Low  | Financial resource sensitivity                        | Very High       |
|                                  |           | Non-financial resource sensitivity                    | Low             |
| Social stigma                    | Low       | Socio-Environment sensitivity and Brand consciousness | High            |

- Documented use of MHM incinerators in:  
<sup>8</sup>Bhuj Airport (1 unit tender floated by Airports Authority of India)

Growth in MHM incinerator demand at domestic airports (government)



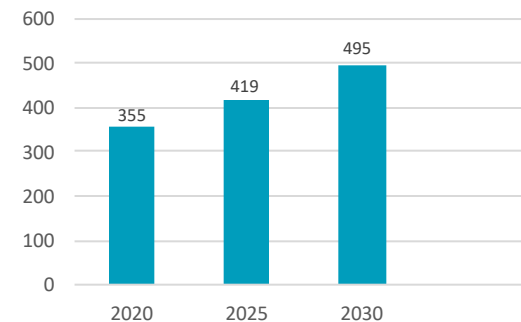
### Segment 8: Tourist Destinations (G)

- The MHM incinerator demand at tourist locations is growing with a **CAGR of 3.36%**

| User                             |          | Decision Maker                                        |             |
|----------------------------------|----------|-------------------------------------------------------|-------------|
| Characteristic                   | Grading  | Characteristic                                        | Grading     |
| Awareness about the need for SWM | Moderate | Priority for MHM Solutions                            | Low         |
| Influence on the decision maker  | Low      | Regulation- LPG Storage                               | Influential |
| Financial resource sensitivity   | Moderate | Financial resource sensitivity                        | Very High   |
|                                  |          | Non-financial resource sensitivity                    | Moderate    |
| Social stigma                    | High     | Socio-Environment sensitivity and Brand consciousness | Low         |

- No documented use of MHM incinerators

Growth in MHM incinerator demand at tourist centers



# Profiling Market Segments

## Other Segments

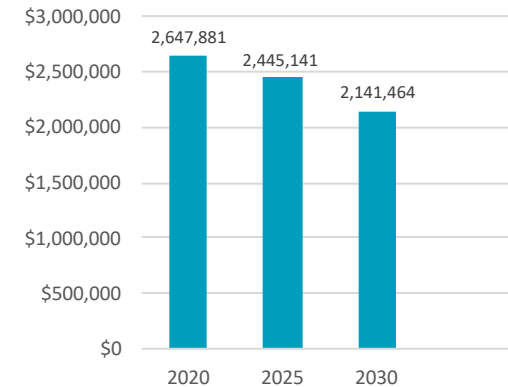
### Segment 9: Offices (G)

- The MHM incinerator demand at Government offices is growing with a CAGR of -2.10%

| User                             |          | Decision Maker                                        |             |
|----------------------------------|----------|-------------------------------------------------------|-------------|
| Characteristic                   | Grading  | Characteristic                                        | Grading     |
| Awareness about the need for SWM | Moderate | Priority for MHM Solutions                            | Moderate    |
| Influence on the decision maker  | Moderate | Regulation- LPG Storage                               | Influential |
| Financial resource sensitivity   | Low      | Financial resource sensitivity                        | Very High   |
|                                  |          | Non-financial resource sensitivity                    | Moderate    |
| Social stigma                    | Low      | Socio-Environment sensitivity and Brand consciousness | Moderate    |

- Documented use of MHM incinerators in:
  - <sup>9</sup>Supreme Court of India (installation of 3 units was planned by March 2018)
  - <sup>10</sup>Central Reserve Police Force (funds were sanctioned for 288 units)
  - <sup>11</sup>Western Railway Headquarters (number of installed units at major offices is not clear)

Trend in MHM incinerator demand at government offices



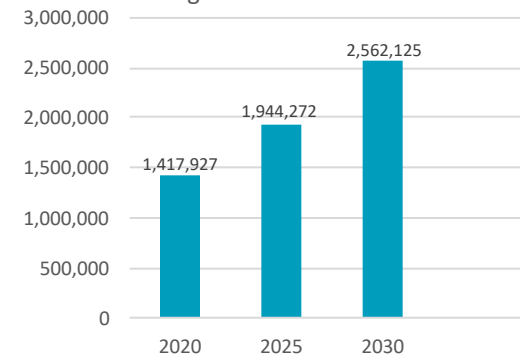
### Segment 11: Factories (G)

- The MHM incinerator demand at Government factories is growing with a CAGR of 6.09%

| User                             |          | Decision Maker                                        |                 |
|----------------------------------|----------|-------------------------------------------------------|-----------------|
| Characteristic                   | Grading  | Characteristic                                        | Grading         |
| Awareness about the need for SWM | Moderate | Priority for MHM Solutions                            | Low             |
| Influence on the decision maker  | Moderate | Regulation- LPG Storage                               | Non-influential |
| Financial resource sensitivity   | Low      | Financial resource sensitivity                        | Very High       |
|                                  |          | Non-financial resource sensitivity                    | Low             |
| Social stigma                    | Moderate | Socio-Environment sensitivity and Brand consciousness | Low             |

- No documented use of MHM incinerators

Growth in MHM incinerator demand at government factories



# Profiling Market Segments

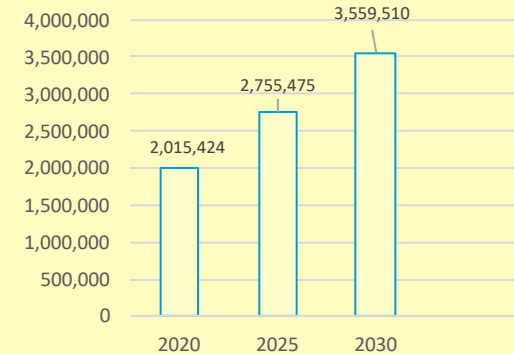
*Of segments which score high on qualitative aspects, 'Office' is the only segment leads quantitatively as well*

## Segment 10: Offices (P)

- The MHM incinerator demand at private offices is growing with a CAGR of 5.85%

| User                             |           | Decision Maker                                        |             |
|----------------------------------|-----------|-------------------------------------------------------|-------------|
| Characteristic                   | Grading   | Characteristic                                        | Grading     |
| Awareness about the need for SWM | Very High | Priority for MHM Solutions                            | High        |
| Influence on the decision maker  | Very High | Regulation- LPG Storage                               | Influential |
| Financial resource sensitivity   | Low       | Financial resource sensitivity                        | Very Low    |
|                                  |           | Non-financial resource sensitivity                    | High        |
| Social stigma                    | Very Low  | Socio-Environment sensitivity and Brand consciousness | High        |

Growth in demand at private offices



- With government offices setting up incinerators for its staff to ensure safe sanitary waste disposal the private sector is following the trend.
- As the corporate world is getting more sensitive towards the needs of women employees the need for menstrual hygiene management is becoming a priority. Most private offices ensure healthy and safe atmosphere for its staff and are willing to install MHM solutions that adhere to laws and regulations.
- Feedback from incumbent and interviews with sample customers showed that showed that the LPG usage at offices is limited, and they are not willing to increase their LPG storages to avoid legal processes with respect to LPG guidelines.

# Profiling Market Segments

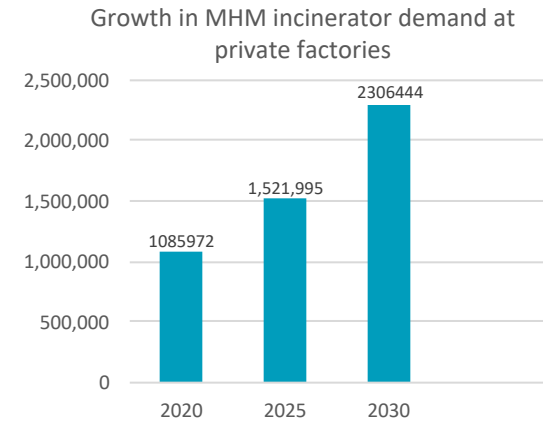
## Other Segments

### Segment 12: Factories (P)

- The MHM incinerator demand at privately owned factories is growing with a CAGR of 7.82%

| User                             |          | Decision Maker                                        |                 |
|----------------------------------|----------|-------------------------------------------------------|-----------------|
| Characteristic                   | Grading  | Characteristic                                        | Grading         |
| Awareness about the need for SWM | Moderate | Priority for MHM Solutions                            | Moderate        |
| Influence on the decision maker  | High     | Regulation- LPG Storage                               | Non-influential |
| Financial resource sensitivity   | Low      | Financial resource sensitivity                        | Low             |
|                                  |          | Non-financial resource sensitivity                    | Low             |
| Social stigma                    | Moderate | Socio-Environment sensitivity and Brand consciousness | Moderate        |

- No documented use of MHM incinerators



### Segment 13: Hospitals (G)

- The MHM incinerator demand at Government hospitals is growing with a CAGR of 1.02%

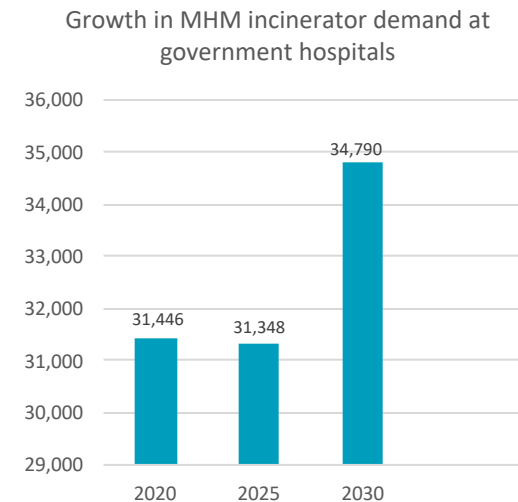
| User                             |          | Decision Maker                                        |                 |
|----------------------------------|----------|-------------------------------------------------------|-----------------|
| Characteristic                   | Grading  | Characteristic                                        | Grading         |
| Awareness about the need for SWM | Low      | Priority for MHM Solutions                            | Very High       |
| Influence on the decision maker  | Low      | Regulation- LPG Storage                               | Non-influential |
| Financial resource sensitivity   | Very Low | Financial resource sensitivity                        | Very High       |
|                                  |          | Non-financial resource sensitivity                    | Moderate        |
| Social stigma                    | High     | Socio-Environment sensitivity and Brand consciousness | Low             |

- Documented use of MHM incinerators in:

<sup>12</sup>I.G.I.M.S, Patna (1 unit installed)

<sup>13</sup>Goa Medical Hospital (1 unit installed)

Military hospital Golkonda (number of installed units not mentioned)



# Profiling Market Segments

## Other Segments

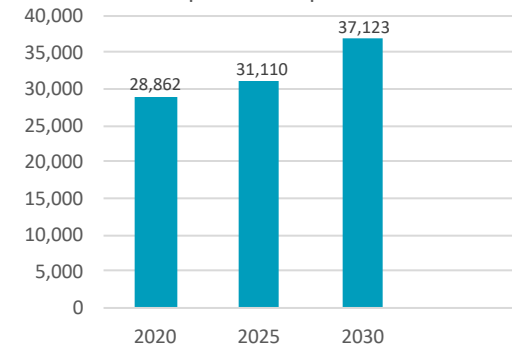
### Segment 14: Hospitals (P)

- The MHM incinerator demand at private hospitals is growing with a **CAGR of 2.55%**

| User                             |          | Decision Maker                                        |                 |
|----------------------------------|----------|-------------------------------------------------------|-----------------|
| Characteristic                   | Grading  | Characteristic                                        | Grading         |
| Awareness about the need for SWM | High     | Priority for MHM Solutions                            | Very High       |
| Influence on the decision maker  | High     | Regulation- LPG Storage                               | Non-influential |
| Financial resource sensitivity   | Very Low | Financial resource sensitivity                        | Low             |
|                                  |          | Non-financial resource sensitivity                    | Moderate        |
| Social stigma                    | Low      | Socio-Environment sensitivity and Brand consciousness | Very High       |

- No documented use of MHM incinerators

Growth in MHM incinerator demand at private hospitals



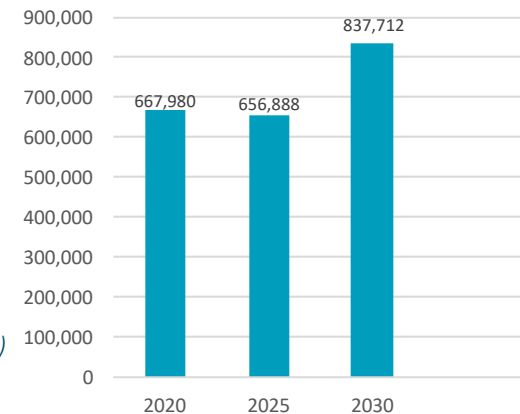
### Segment 15: Schools (G)

- The MHM incinerator demand at Government schools is growing with a **CAGR of 2.29%**

| User                             |          | Decision Maker                                        |             |
|----------------------------------|----------|-------------------------------------------------------|-------------|
| Characteristic                   | Grading  | Characteristic                                        | Grading     |
| Awareness about the need for SWM | Low      | Priority for MHM Solutions                            | Moderate    |
| Influence on the decision maker  | Low      | Regulation- LPG Storage                               | Influential |
| Financial resource sensitivity   | Very Low | Financial resource sensitivity                        | Very High   |
|                                  |          | Non-financial resource sensitivity                    | Moderate    |
| Social stigma                    | Moderate | Socio-Environment sensitivity and Brand consciousness | Very Low    |

- Documented use of MHM incinerators in:
  - <sup>14</sup>Chennai government schools (1136 unit installed)
  - <sup>15</sup>1845 private & govt schools in Kerala (installation planned; number of units per school not mentioned)
  - <sup>16</sup>1069 govt schools in Gujarat (installation planned; number of units per school not mentioned)

Growth in MHM incinerator demand at government schools



# Profiling Market Segments

## Other Segments

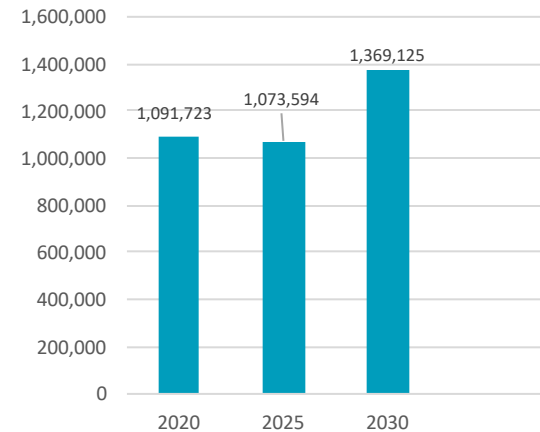
### Segment 16: Schools (P)

- The MHM incinerator demand at private schools is growing at a **CAGR of 2.29%**

| User                             |          | Decision Maker (Private)                              |             |
|----------------------------------|----------|-------------------------------------------------------|-------------|
| Characteristic                   | Grading  | Characteristic                                        | Grading     |
| Awareness about the need for SWM | High     | Priority for MHM Solutions                            | High        |
| Influence on the decision maker  | High     | Regulation- LPG Storage                               | Influential |
| Financial resource sensitivity   | Very Low | Financial resource sensitivity                        | Low         |
|                                  |          | Non-financial resource sensitivity                    | Moderate    |
| Social stigma                    | Low      | Socio-Environment sensitivity and Brand consciousness | High        |

- Documented use of MHM incinerators in:  
<sup>15</sup>**Entity:** 1845 private & govt schools in Kerala (installation planned; units per school not mentioned)  
 St. Joseph's High School, Hyderabad (number of installed units not mentioned)  
 Abhudaya High School, Hyderabad (number of installed units not mentioned)

Growth in MHM incinerator demand users at schools



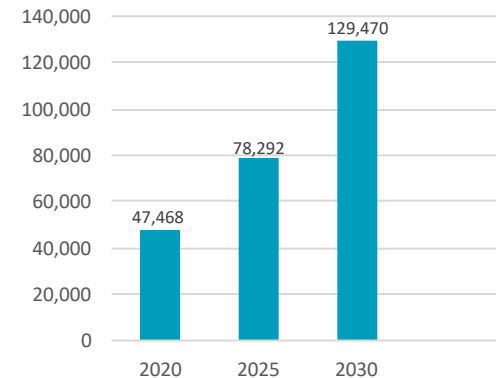
### Segment 17: Malls (P)

- The MHM incinerator demand at malls is growing with a **CAGR of 10.55%**

| User                             |         | Decision Maker                                        |             |
|----------------------------------|---------|-------------------------------------------------------|-------------|
| Characteristic                   | Grading | Characteristic                                        | Grading     |
| Awareness about the need for SWM | High    | Priority for MHM Solutions                            | Moderate    |
| Influence on the decision maker  | High    | Regulation- LPG Storage                               | Influential |
| Financial resource sensitivity   | Low     | Financial resource sensitivity                        | Low         |
|                                  |         | Non-financial resource sensitivity                    | High        |
| Social stigma                    | Low     | Socio-Environment sensitivity and Brand consciousness | High        |

- No documented use of MHM incinerators

Growth in MHM incinerator demand users at malls



# Profiling Market Segments

## Other Segments

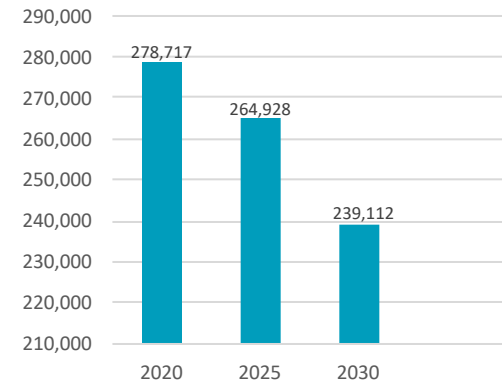
### Segment 18: HEIs (G)

- The MHM incinerator demand at Government HEIs is growing with a **CAGR of -1.52%**

| User                             |           | Decision Maker                                        |             |
|----------------------------------|-----------|-------------------------------------------------------|-------------|
| Characteristic                   | Grading   | Characteristic                                        | Grading     |
| Awareness about the need for SWM | Very High | Priority of MHM Solutions                             | Moderate    |
| Influence on the decision maker  | High      | Regulation- LPG Storage                               | Influential |
| Financial resource sensitivity   | Very Low  | Financial resource sensitivity                        | Very High   |
|                                  |           | Non-financial resource sensitivity                    | Low         |
| Social stigma                    | Low       | Socio-Environment sensitivity and brand consciousness | Low         |

- Documented use of MHM incinerators in:
  - <sup>17</sup>Maharaja's College, Ernakulam (number of installed units not mentioned)
  - <sup>18</sup>Ranchi Women's College (number of installed units not mentioned)
  - JNTU Hyderabad (number of installed units not mentioned)

Trend in MHM incinerator demand at government colleges



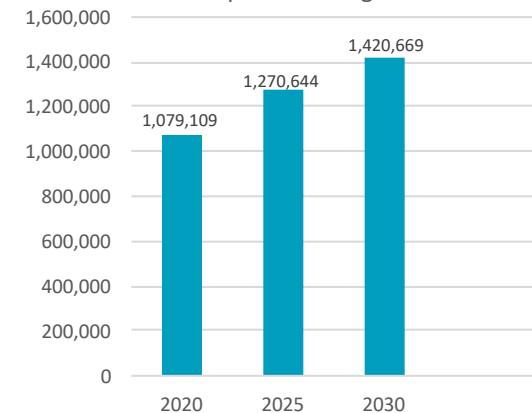
### Segment 19: HEIs (P)

- The MHM incinerator demand at Private HEIs is growing with a **CAGR of 2.79%**

| User                             |          | Decision Maker                                        |             |
|----------------------------------|----------|-------------------------------------------------------|-------------|
| Characteristic                   | Grading  | Characteristic                                        | Grading     |
| Awareness about the need for SWM | High     | Priority for MHM Solutions                            | High        |
| Influence on the decision maker  | High     | Regulation- LPG Storage                               | Influential |
| Financial resource sensitivity   | Very Low | Financial resource sensitivity                        | Low         |
|                                  |          | Non-financial resource sensitivity                    | Low         |
| Social stigma                    | Low      | Socio-Environment sensitivity and Brand consciousness | High        |

- Documented use:
  - <sup>18</sup>Nirmala College Ranchi (1 unit installed)
  - <sup>19</sup>300 inter colleges in Uttar Pradesh (number of planned units not mentioned)
  - HITAM university Hyderabad (number of installed units not mentioned)

Growth in MHM incinerator demand at private colleges



# Profiling Market Segments

## Other Segments

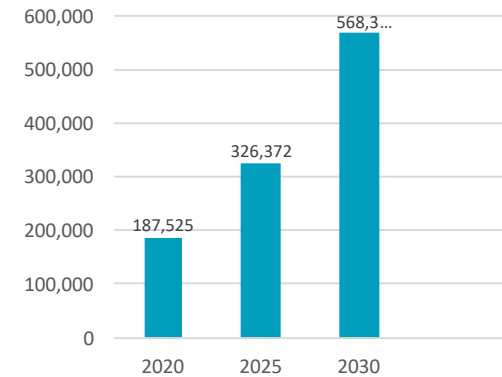
### Segment 20: Restaurants (P)

- The MHM incinerator demand at restaurants is growing with a CAGR of 11.73%

| User                             |          | Decision Maker (Government)                           |             |
|----------------------------------|----------|-------------------------------------------------------|-------------|
| Characteristic                   | Grading  | Characteristic                                        | Grading     |
| Awareness about the need for SWM | Moderate | Priority for MHM Solutions                            | Moderate    |
| Influence on the decision maker  | High     | Regulation- LPG Storage                               | Influential |
| Financial resource sensitivity   | Low      | Financial resource sensitivity                        | High        |
|                                  |          | Non-financial resource sensitivity                    | High        |
| Social stigma                    | Low      | Socio-Environment sensitivity and Brand consciousness | Moderate    |

- No documented use of MHM incinerators

Growth in MHM incinerator demand at restaurants



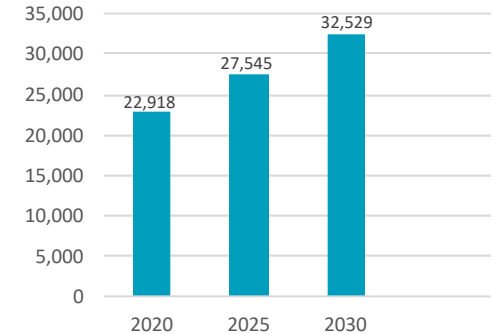
### Segment 21: Hotels (P)

- The MHM incinerator demand at hotels is growing with a CAGR of 3.56%

| User                             |           | Decision Maker (Government)                           |                 |
|----------------------------------|-----------|-------------------------------------------------------|-----------------|
| Characteristic                   | Grading   | Characteristic                                        | Grading         |
| Awareness about the need for SWM | Very High | Priority for MHM Solutions                            | Very High       |
| Influence on the decision maker  | Very High | Regulation- LPG Storage                               | Non-influential |
| Financial resource sensitivity   | Very Low  | Financial resource sensitivity                        | Very Low        |
|                                  |           | Non-financial resource sensitivity                    | Low             |
| Social stigma                    | Very Low  | Socio-Environment sensitivity and Brand consciousness | Very High       |

- No documented use of MHM incinerators

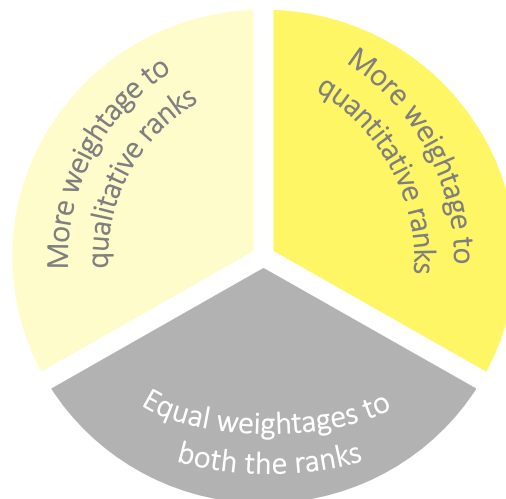
Growth in MHM incinerator demand at hotels



# Considering the market size analysis with qualitative scoring can inform market entry strategy.

Results based on weighting 75% on qualitative rankings and 25% on quantitative rankings.

| Sector                           | Rank |
|----------------------------------|------|
| Offices (Private)                | 1    |
| Hotels (Private)                 | 2    |
| Hospitals (Private)              | 3    |
| HEIs (Private)                   | 4    |
| International airports (Private) | 5    |



Results based on weighting 25% on qualitative rankings and 75% on quantitative rankings.

| Sector                 | Rank |
|------------------------|------|
| Offices (Private)      | 1    |
| Factories (Private)    | 2    |
| Factories (Government) | 3    |
| Schools (Private)      | 4    |
| Offices (Government)   | 5    |

Results based on weighting 50% on qualitative rankings and 50% on quantitative rankings.

| Sector                 | Rank |
|------------------------|------|
| Offices (Private)      | 1    |
| Factories (Private)    | 2    |
| Schools (Private)      | 3    |
| HEIs (Private)         | 4    |
| Factories (Government) | 5    |

# References for market segment profiles

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