

**STeP**

Sanitation Technology  
Platform

# Market Insights for the Reinvented Toilet, India

Brandy Salmon, Chandrima Das,  
James Jones, Rishi Agarwal

February 2017



REIMAGINING SOCIAL CHANGE



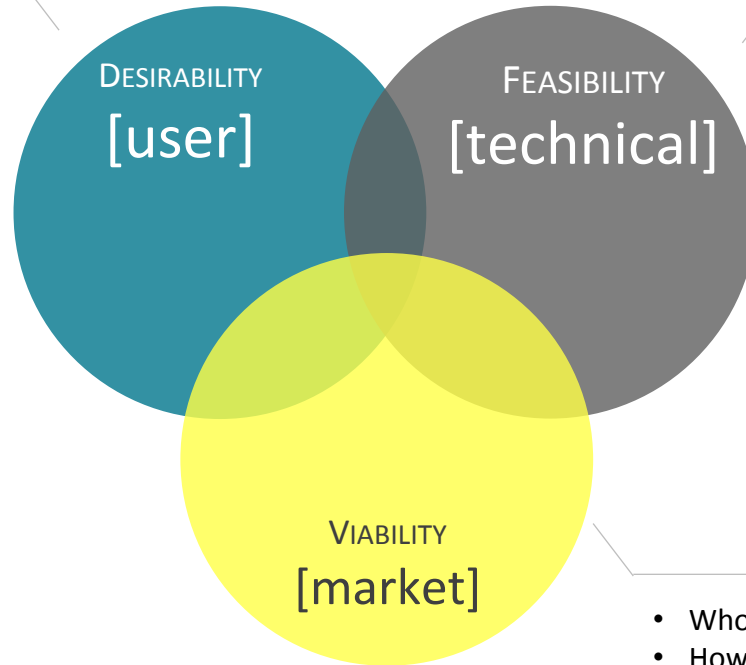
# STeP accelerates innovations in sanitation by:

- Connecting partners
- Enabling field testing
- Supporting commercialization



# Fusing market, technical, and user insights informs technology design in concert with business planning.

- What are the perceived and real benefits for the users? For the customers? For patients?
- What drives purchase decisions?
- What drives adoption?



- What are the physical, biological, contextual and environmental requirements of an innovation?
- Is it possible to deliver on those requirements?
- What enabling technologies and products are available to support your efforts?
- With what will you be competing?

- Who is the customer?
- How might the solution benefit them?
- What is their willingness to pay?
- How big is the opportunity?
- What is the unique advantage over competitors?

# The STeP six is a suite of services designed to address all facets of technology testing and commercialization.



## FIELD TESTING

Field test with local partners in target markets to inform design and development.



## USER INSIGHTS

Gain user insights to data-driven decisions and inform design.



## LOGISTICS & MANAGEMENT

Develop and execute a concrete plan covering all logistics and management.



## MARKET INTELLIGENCE

Design a strong business plan for your idea using market intelligence.



## RULES & REGULATIONS

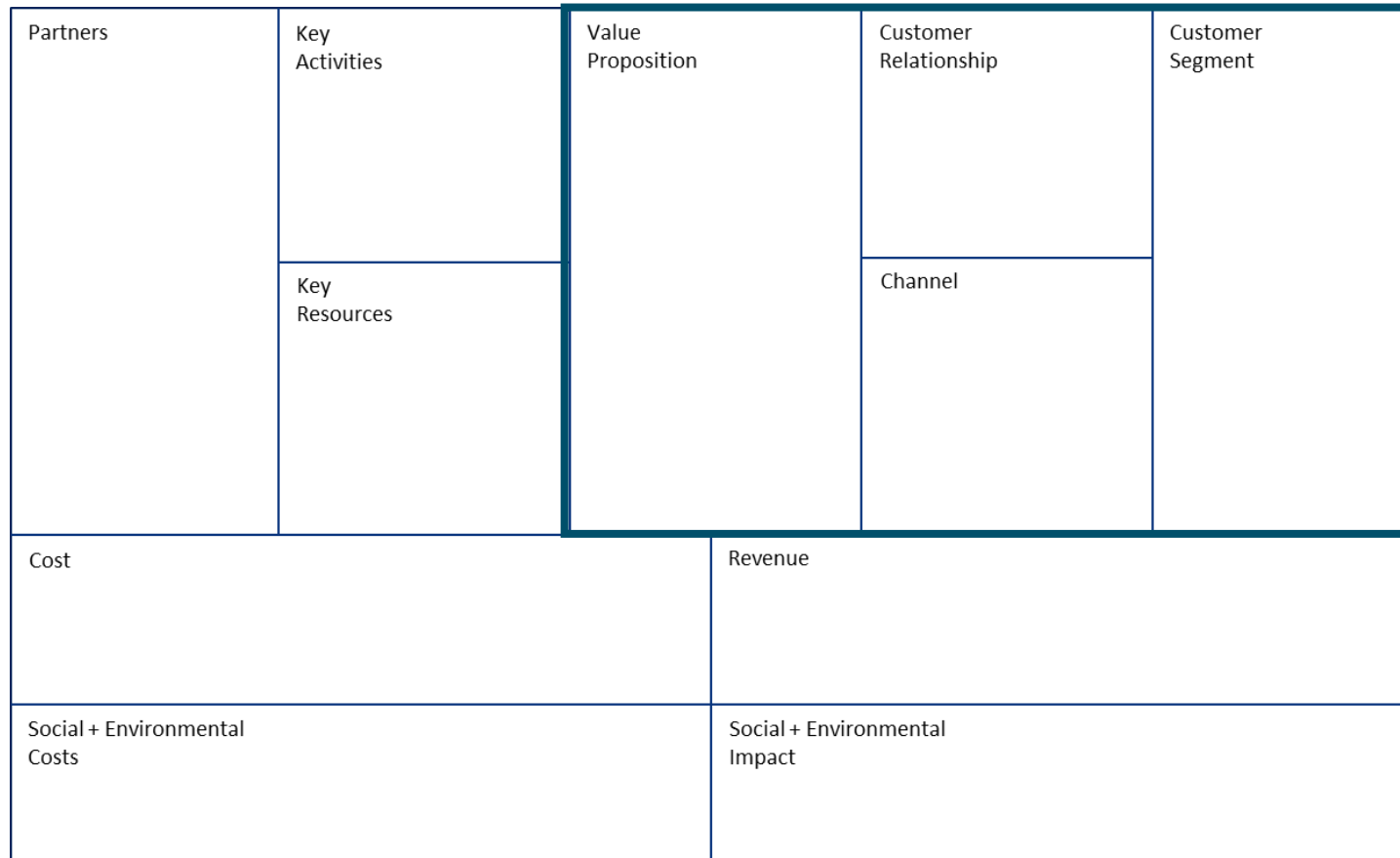
Adhere to rules & regulations to gain permissions for testing and support standards.



## TECHNOLOGY TRANSFER

Make critical connections to support technology transfer and business launch.

# The Business Model Canvas guides the approach, sequence and prioritization of research.





Together, with leading organizations, universities, and experts around the world, STeP delivers expertise and support to partners.



To frame market insights, the product categories have been defined as SURT & MURT.

### Single Unit RT (SURT)

A system that treats waste for a single-unit (< 10 users).

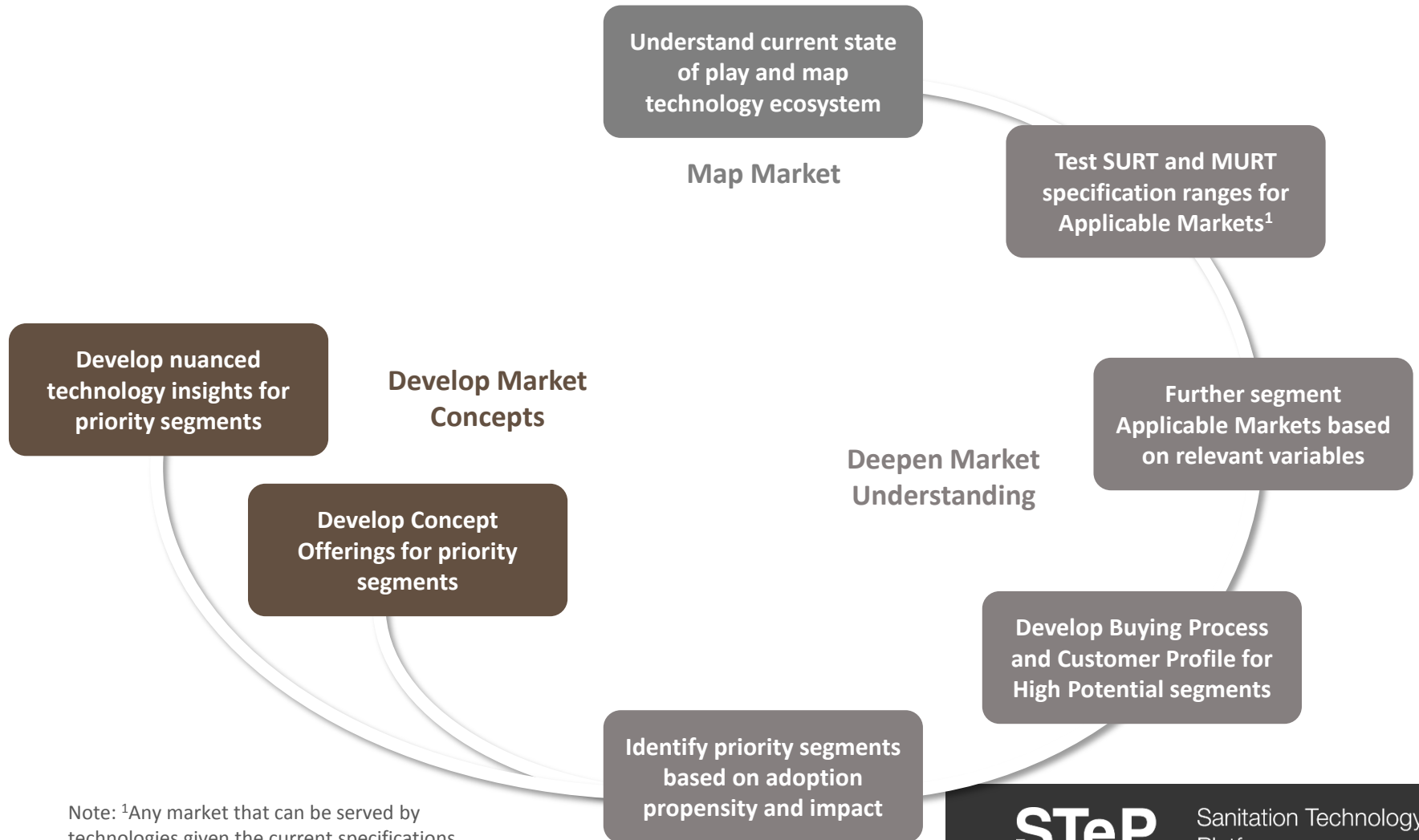
### Multi Unit RT (MURT)

A system that treats waste for multiple units (10-100 users).



# Analytical Design

## To develop Market Concepts for SURT and MURT

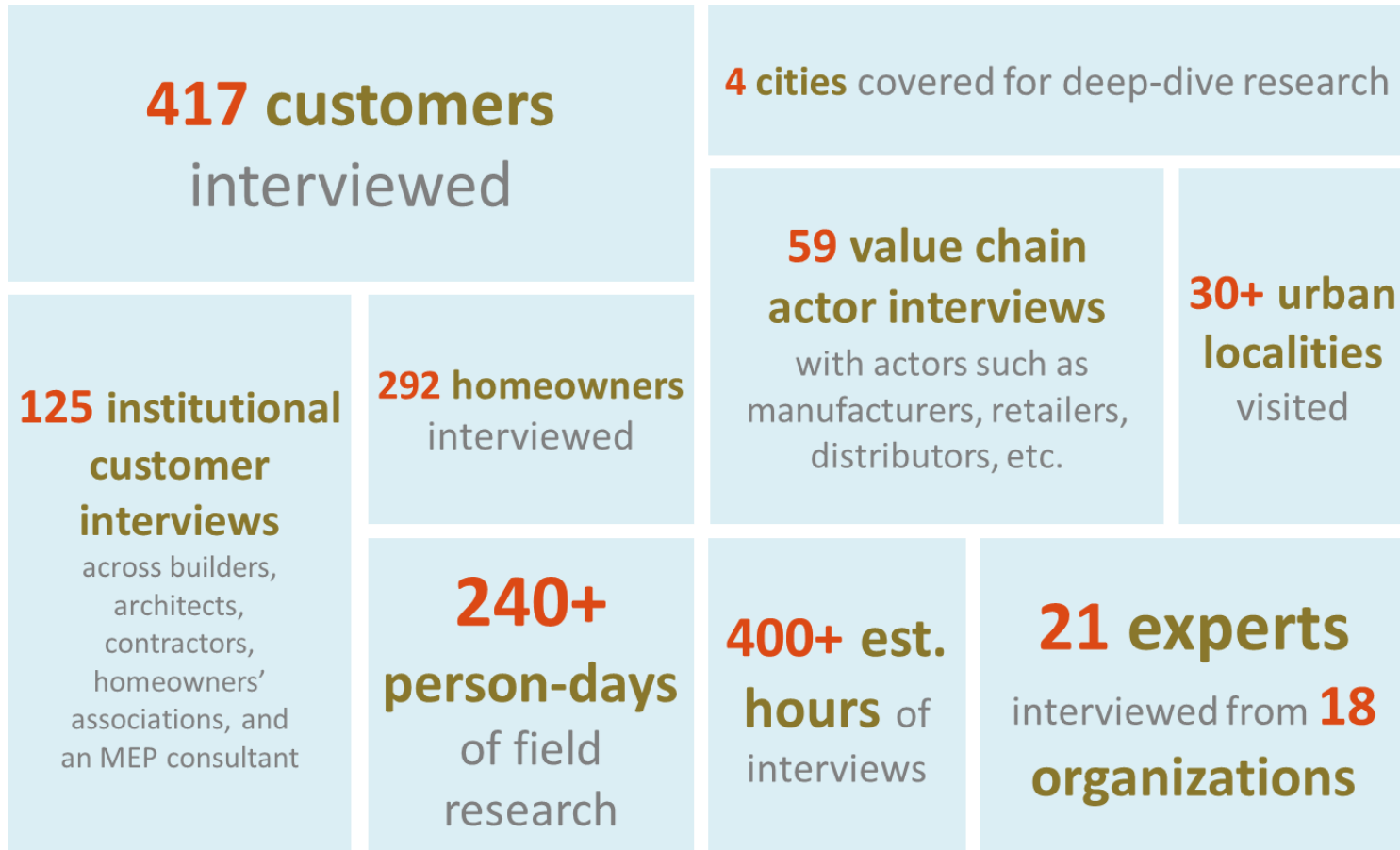


Note: <sup>1</sup>Any market that can be served by technologies given the current specifications



# Data Gathering

## Insights driven by Qualitative Primary Research



Source: FSG primary research














































# Single Unit RT Segmentation Frame

<i>Age of construction (a)</i>		New construction (<1 year)		Existing construction (>1 year)			
<i>Toilet ownership</i>				No toilet		Toilet	
<i>Drain availability</i>		No drain	Drain			Old (>10yrs.)	
<i>Age of construction (b)</i>				No drain	Drain		
<i>Occupation of Chief Wage Earner</i>	<i>Highest education achieved in family</i>						
Skilled labor and small business owners							
Salaried	Some college education						
	No college education						
Unskilled labor							

# Single Unit RT Segmentation Map

Age of construction (a)		New construction (<1 year)		Existing construction (>1 year)					
Toilet ownership				No toilet		Toilet			
Drain availability		No drain	Drain			Old (>10yrs.)		Recent(<10yrs.)	No drain
Age of construction (b)									
Occupation of Chief Wage Earner	Highest education achieved in family	[Hatched]		[Hatched]		[Hatched]		[Hatched]	
Skilled labor and small business owners		1	3	4	5	6	8		
Salaried	Some college education								
	No college education	2					7	9	
Unskilled labor									

# Single Unit RT Segment Descriptors | By-products

Age of construction (a)		New construction (<1 year)		Existing construction (>1 year)						
				No toilet		Toilet				
Toilet ownership		No drain		Drain		No drain		Drain		
Drain availability										
Age of construction (b)		No drain		Drain		Old (>10 yrs.)		Recent (<10 yrs.)		
Occupation of Chief Wage Earner										Highest education achieved in family
Skilled labor and small business owners		1  	3  	4  	5  	6  	8  			
Salaried	Some college education	  	  	  	  	  	  			
	No college education	2  					7  	9  		
Unskilled labor		  					  	  		

## Utility for by-products

### By-product type

Electricity      Biogas      Water      Ash      Fertilizer



### Utility color coding


Negative      Neutral      Medium      High



Value for By-products was evaluated on a relative basis., and as 'stated value'. This does not imply absolute lack of value and HHs may use by-products evaluated as 'neutral' with behavior change and education.

# Multi Unit RT Segmentation Map

Age of construction		New construction		Existing construction	
Usage type		Residential	Commercial/ Institutional	Residential	Commercial/ Institutional
Primary price/ ULB land categorization	Average hours of electricity supply				
Premium & Luxury		①	⑤		⑧
Mid-segment	Low electricity (≤80% hours)	②	⑤	⑥	⑧
	High electricity (>80% hours)	③		⑦	
Affordable		④		⑦	

 Segment not observed

Source: FSG primary research; FSG analysis

# Multi Unit RT Segment Descriptors | By-products

Age of construction		New construction		Existing construction	
Usage type		Residential	Commercial/ Institutional	Residential	Commercial/ Institutional
Primary price/ ULB land categorization	Average hours of electricity supply				
Premium & Luxury		①	⑤		⑧
Mid-segment	Low electricity (≤80% hours)	②		⑥	
	High electricity (>80% hours)	③			
Affordable		④		⑦	

By-product type



Utility color coding



**Value for By-products was evaluated on a relative basis., and as 'stated value'. This does not imply absolute lack of value and HHs may use by-products evaluated as 'neutral' with behavior change and education.**


Note: For biogas, commercial / institutional segments do not have any consumption usage and find the odour of the waste gas undesirable

Source: FSG primary research; FSG analysis




# Content of Detailed Segment Profiles

**1** **Segment 1 | Key Statistics**




**Key Statistics**  
 Overview of key quantitative information regarding the segment, including household descriptors, assets and education, and infrastructure

**5** **Segment 1 | Benefit Pyramid**




**Benefit Pyramid**  
 Desired hierarchy of benefits for the segment

**2** **Segment 1 | Segment Story**



**Customer Story**  
 Narrative form that illustrates the insights gained translated into real-life situations

**6** **Segment 1 | Demonstrated Spend**



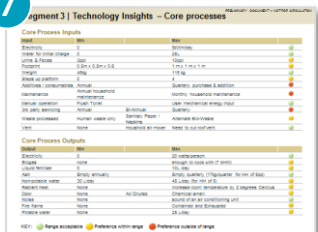
**Demonstrated Spend**  
 Overview of key spending patterns for the segment, including sanitation, assets and utilities

**3** **Segment 1 | Customer Profile**



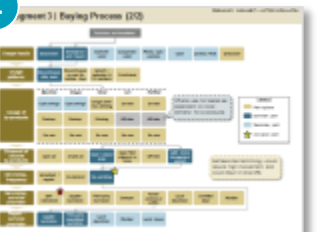
**Customer Profile**  
 Insights into context, ask, and mental model for the segment

**7** **Segment 1 | Technology Insights - Core processes**



**Considerations for Tech. Design**  
 Applicability of black-box technology parameters for the segment

**4** **Segment 1 | Buying Process (D3)**



**Buying Process**  
 Buying behavior and leverage points for the segment

# Testing Technology Parameters

## Using Building Blocks



Noise



Processing unit



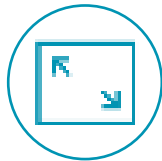
Maintenance



Placement and  
Footprint



Fire Flame



Water tank on Roof



Ash



On-going Spend



Radiant heat



Cost of infrastructure



Water Production  
and Disposal



Elevation of Pedestal

# Testing Technology Parameters

## Illustrative Cards and Probes

*Building Blocks exercise for Footprint*

Which of these options would be acceptable to you?

<p><b>Footprint</b></p> <p><i>Placement</i></p> <p>Processing unit outside house separate from plate / pedestal</p>	<p><b>Footprint</b></p> <p><i>Placement</i></p> <p>Processing unit outside house directly under plate / pedestal</p>	<p><b>Footprint</b></p> <p><i>Placement</i></p> <p>Processing unit inside house separate from plate / pedestal</p>	<p><b>Footprint</b></p> <p><i>Placement</i></p> <p>Processing unit inside house directly under plate / pedestal</p>
<p><b>Footprint</b></p> <p><i>Surface</i></p> <p>0.4m x 0.4m</p>	<p><b>Footprint</b></p> <p><i>Surface</i></p> <p>0.6m x 0.6m</p>	<p><b>Footprint</b></p> <p><i>Surface</i></p> <p>0.8m x 0.8m</p>	<p><b>Footprint</b></p> <p><i>Surface</i></p> <p>1m x 1m</p>
<p><b>Footprint</b></p> <p><i>Depth</i></p> <p>0.4m</p>	<p><b>Footprint</b></p> <p><i>Depth</i></p> <p>0.6m</p>	<p><b>Footprint</b></p> <p><i>Depth</i></p> <p>0.8m</p>	<p><b>Footprint</b></p> <p><i>Depth</i></p> <p>1m</p>

*Probes following exercise*

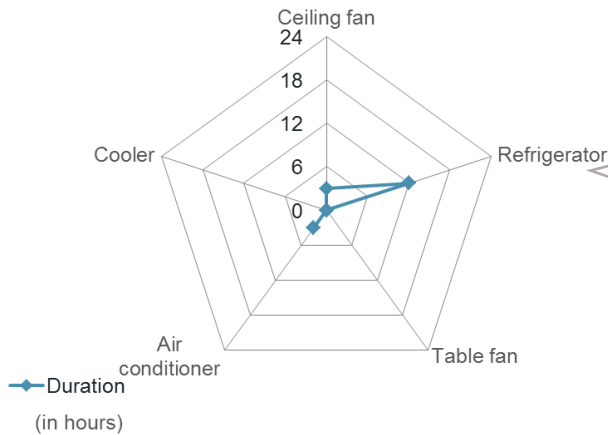
- Verification of understanding: *Was there any variable you did not understand the meaning of?*
- Rationale for choice(s): *Why have you selected this/ these option(s)?*
- Rationale for exclusion: *Why have you excluded the other option(s)?*
- Acceptability of additional option(s): *What are the conditions under which you would be willing to consider the other option(s)?*
- Tradeoffs: *What variable(s) would you not be willing to make compromises on? What variable(s) would you be most flexible making compromises on?*

# Detailed Technology Insights

Outputs for parameters, for each focus segment

## Tradeoffs – Representation

### Acceptable Envelope



Acceptable envelope represented as a radar chart

Stated Choice

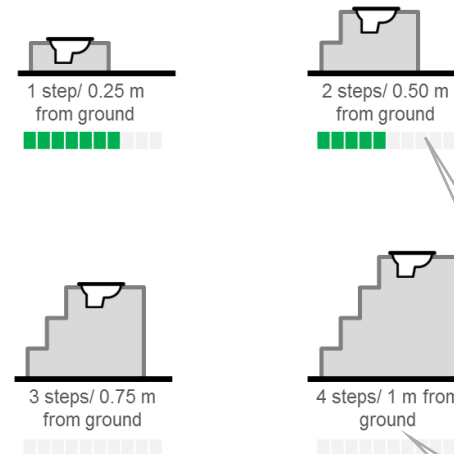
Intensity	Air conditioner
Duration	3 hours a day

Stated (or most preferred) choice represented in table form

## Independent Parameters – Representation

### Acceptable Envelope

#### Number of Steps



Equalizers for each option represent degree of acceptability

# Top Takeaways from the Approach

- A **disaggregated view of the market** provides more robust insights on the specific needs of different customer segments
- **Different stakeholders may be best placed to serve different parts of the market** – a commercial player may be interested in a more commercially viable segment, while an impact player may want to serve the segments with highest impact potential
- **Technology development requires testing with customers at different stages** – concept development, prototype and commercialization
- **A human-centered design approach** is essential to generating technology insights at the concept development stage

# Top Takeaways for the SURT

- **Building characteristics** such as age of construction, toilet ownership and drain availability **predict customer's tendency to value a solution** that does not store and completely treats fecal waste
- **Demographic characteristics** such as the occupation of the chief wage earner of the household and the highest education achieved in the family meaningfully **affect involvement in sanitation as a category and the purchase of new technology**
- **Construction of a new home, or the desire to install a toilet** in a setting where current technologies do not allow for one, were strong drivers for the adoption of the RT
- While **electricity production, and to some extent biogas, were valued** by customers, water, ash and liquid fertilizers are not viewed as by-products but as waste products for disposal by most segments
- **Flexible and modular** design that can be adapted to the settings of the individual home – placement inside/ outside the home, adjustable size
- Design **self-maintenance processes as non-technical, simplified tasks** that can be carried out by household members



# Top Takeaways for the MURT

- **Building and site characteristics** such as age of construction, primary price, ULB land categorization meaningfully **affect propensity to install septage management solutions and value for solutions that enable complete treatment** of fecal waste
- **Usage type (commercial / residential) and availability of electricity** meaningfully affect propensity to install value adding amenities and tendency to value by-products
- **Construction of a new project** – especially for residential purposes – is a **strong driver for adoption**
- While **electricity production, and to some extent biogas, was valued by customers**, ash and liquid fertilizers are viewed as waste products for disposal by most segments. **Non-potable water found useful in certain segments**
- Design for minimum operation time, and minimum noise
- Design that enables **flexible placement** depending on building layout and space available on the ground floor, **underground placement**
- Design **simple maintenance process requiring minimal actions** from residents or part-time building workforce, and does not require technical expertise

# STeP

Sanitation Technology  
Platform

# THANK YOU!

February 2017



REIMAGINING SOCIAL CHANGE

