Marketing Clean Cookstove

In Peri-Urban Area of Central Java

Voravate “Tig” Tuntivate
Outline

- Market Segment of Biomass Stove/Fuel
- Characteristics of Consumers
- Biomass Stove Market
- Preferred Characteristics and Design Feature of Stove
Map of the Market Survey Area
Covering Bantul and Sleman District
(10 KM Outside the Ring Road)
In the Survey Area Three Mutually Exclusive Market Segments Can be Formed

- Biomass Users 25%
- Biomass and LPG Users (48%)
- LPG Users (27%)
Source of Biomass Fuel Used in the Household

- More than Three Quarter (78 percent) of the Household Collect Biomass Fuel, and
- Another 12 Percent Collect and Purchase Biomass Fuel
Average Household Monthly Income by Market Segment

Household Monthly Income

- All Biomass: $1,454,027
- Biomass Only: $1,411,581
- All LPG: $3,094,771
- LPG Only: $2,406,188
- All LPG & Biomass: $2,534,415
- LPG & Biomass Only: $2,015,638
Household Monthly Spending (in IDR) on Cooking Fuels

<table>
<thead>
<tr>
<th>Expenditure on Cooking Fuels</th>
<th>Biomass Users Only</th>
<th>LPG Users Only</th>
<th>LPG &amp; Biomass Users</th>
<th>All Users</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>61,086</td>
<td>62,391</td>
<td>58,239</td>
<td>59,817</td>
</tr>
</tbody>
</table>

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Who Use Biomass Cookstove?

Average Age of Cook in the Household

- Biomass Users 48 Years Old
- Biomass and LPG Users 45 Years Old
- LPG Users 41 Years Old

Exclude Male Cook Which Accounts for only 4 percent
Biomass Stove Market is Still Relatively Large

- Each Household Owns two or more Biomass Stoves,
- “Keren” Stove accounts for 63%
- One/Two Potholes Fixed Stove accounts for 31%
- Stove made of Stone 7%
- Three/Five Stones 4%
Average Cost of Biomass Cookstove

Note: Cost reflects recollection of cost paid by the household at the time of purchase.
Average Household Monthly Income by Type of Biomass Cookstove Owned

<table>
<thead>
<tr>
<th>Cookstove Type</th>
<th>Household Monthly Income (in IDR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keren Stove</td>
<td>2,264,212</td>
</tr>
<tr>
<td>Fixed (Mud &amp; Brick)</td>
<td>2,140,186</td>
</tr>
<tr>
<td>Fixed (Brick &amp; Cement)</td>
<td>2,907,446</td>
</tr>
<tr>
<td>1/2 Pot Holes Stone Stove</td>
<td>1,893,768</td>
</tr>
<tr>
<td>Anglo Stove</td>
<td>2,717,267</td>
</tr>
<tr>
<td>3/5 Stones Stove</td>
<td>2,109,548</td>
</tr>
</tbody>
</table>
Currently, households spend more on pots than stoves.

Attitude Toward Cost of Stoves and Pots

- **Pots are more expensive than stove**
  - Strongly Agree: 2%
  - Agree: 84%
  - No Opinion: 6%
  - Disagree: 9%
  - Strongly Disagree: 0%

- **I am willing to pay more on pots than on stove**
  - Strongly Agree: 35%
  - Agree: 9%
  - No Opinion: 9%
  - Disagree: 54%
  - Strongly Disagree: 0%

- **I prefer to buy nice looking pots**
  - Strongly Agree: 35%
  - Agree: 9%
  - No Opinion: 9%
  - Disagree: 55%
  - Strongly Disagree: 0%

- **I am willing to pay double for biomass stove that last at least 2 yrs**
  - Strongly Agree: 28%
  - Agree: 19%
  - No Opinion: 6%
  - Disagree: 54%
  - Strongly Disagree: 0%
Attitude toward Firewood

- Food tastes good when cooking with FW
- Cooking with FW is not convenient
- Preparing FW is a burden for my family
- FW is getting harder to find
- FW is expensive for cooking
- FW is hard to obtain in the market

Strongly Agree | Agree | No Opinion | Disagree | Strongly Disagree
---|---|---|---|---
Food tastes good when cooking with FW: 9% | 71% | 9% | 14%
Cooking with FW is not convenient: 37% | 4% | 58%
Preparing FW is a burden for my family: 19% | 11% | 70%
FW is getting harder to find: 18% | 7% | 74%
FW is expensive for cooking: 11% | 9% | 79%
FW is hard to obtain in the market: 9% | 24% | 67%

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Majority of Households in the Survey Area only do One Major Cooking in a Day

Average Total Time (in Minutes) Spent on Cooking
Cooking and Reheating Activity in the Morning

- **Boil water**: 97% (Cooking), 96% (Reheating)
- **Deep fried**: 75% (Cooking), 75% (Reheating)
- **Stir fried**: 58% (Cooking), 34% (Reheating)
- **Grill food**: 13% (Cooking), 13% (Reheating)
- **Cook/Reheating rice**: 46% (Reheating)
- **Making soup**: 0.1% (Cooking), 0.6% (Reheating)
- **Steam/Boil**: 0.2% (Cooking), 0.8% (Reheating)
Cooking and Reheating Activity in the Evening

- **Boil water**: 60%
- **Cook/Reheating rice**: 30%
- **Deep fried**: 11%
- **Making/Reheating soup**: 8%
- **Stir fried**: 8%
- **Steam/Boil**: 5%
- **Grill food**: 0.50%
- **Making/Reheating soup**: 2%
- **Stir fried**: 0.70%
- **Steam/Boil**: 0%
- **Cook/Reheating rice**: 14%
- **Grill food**: 40%

**Cooking and Reheating Activities**

- **Boil water**: 60%
- **Cook/Reheating rice**: 30%
- **Deep fried**: 11%
- **Making/Reheating soup**: 8%
- **Stir fried**: 8%
- **Steam/Boil**: 5%
- **Grill food**: 0.50%
- **Making/Reheating soup**: 2%
- **Stir fried**: 0.70%
- **Steam/Boil**: 0%
- **Cook/Reheating rice**: 14%
- **Grill food**: 40%
Water Boiling is One of the Most Important Activities Carried Out in the Kitchen

- Almost Every Households Boil Water in the Morning for Drinking, and
- Close to Two Third of the Households Boil Water Again in the Evening.
- Biomass Stove is the Preferred Stove Used to Boil Water.
- There is a Good Potential for Marketing Biomass Stove to Specifically Used for Boiling Water.
Boiling Water Yesterday

- To drink, 46%
- To drink & bath/wash, 53%
- Do not boil water, 1%
Type of Stove Used to Boil Water

- **Biomass Stove**
  - Drink, 29%
  - Drink & Bath/Wash, 31%
  - Bath/Wash, 9%

- **LPG Stove**
  - Drink, 30%
  - Drink & Bath/Wash, 13%
  - Bath/Wash, 0.9%
What are the preferred characteristics and design features of stove?
Important Design Features of Cookstove (1)

- Can use different size – diameter of firewood
- Can use any type of biomass fuels i.e., FW,
- Can promptly reduce or increase heat
- Emits less smoke
- Can easily remove and/or add fuel
- Convenient and easy to operate
- Use less fuel
- Give high heat/Cook fast
- Durable
- Start fire quickly

<table>
<thead>
<tr>
<th>Feature</th>
<th>Very important</th>
<th>Important</th>
<th>Not so important</th>
<th>Do not know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can use different size – diameter of firewood</td>
<td>39%</td>
<td>61%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Can use any type of biomass fuels i.e., FW,</td>
<td>32%</td>
<td>67%</td>
<td>0%</td>
<td>1%</td>
</tr>
<tr>
<td>Can promptly reduce or increase heat</td>
<td>36%</td>
<td>63%</td>
<td>1%</td>
<td>0%</td>
</tr>
<tr>
<td>Emits less smoke</td>
<td>27%</td>
<td>70%</td>
<td>2%</td>
<td>0%</td>
</tr>
<tr>
<td>Can easily remove and/or add fuel</td>
<td>6%</td>
<td>92%</td>
<td>1%</td>
<td>0%</td>
</tr>
<tr>
<td>Convenient and easy to operate</td>
<td>4%</td>
<td>91%</td>
<td>5%</td>
<td>1%</td>
</tr>
<tr>
<td>Use less fuel</td>
<td>7%</td>
<td>84%</td>
<td>6%</td>
<td>2%</td>
</tr>
<tr>
<td>Give high heat/Cook fast</td>
<td>8%</td>
<td>82%</td>
<td>8%</td>
<td>0%</td>
</tr>
<tr>
<td>Durable</td>
<td>6%</td>
<td>84%</td>
<td>10%</td>
<td>0%</td>
</tr>
<tr>
<td>Start fire quickly</td>
<td>5%</td>
<td>82%</td>
<td>12%</td>
<td>0%</td>
</tr>
</tbody>
</table>

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Important Design Features of Cookstove (2)

- Start fire quickly: 39% Very important, 61% Important, 0% Not so important, 0% Do not know
- Durable: 32% Very important, 67% Important, 1% Not so important, 0% Do not know
- Give high heat/Cook fast: 36% Very important, 63% Important, 1% Not so important, 0% Do not know
- Use less fuel: 27% Very important, 70% Important, 2% Not so important, 0% Do not know
- Convenient and easy to operate: 6% Very important, 92% Important, 1% Not so important, 0% Do not know
- Can easily remove and/or add fuel: 4% Very important, 91% Important, 5% Not so important, 0% Do not know
Preferred Cooking Position

Implication on Height of Stove
Preferred Cooking Position

- **Biomass Users**: 94% Sitting, 5% Standing, 1% Squatting
- **LPG Users**: 75% Sitting, 24% Standing, 1% Squatting
- **Biomass & LPG Users**: 54% Sitting, 40% Standing, 6% Squatting
Height of Seating While Cooking

- Sitting slightly above ground level, 89%
- Sitting at typical chair level, 9%
- Squatting and Other, 2%
Majority of the households surveyed have strong desire to change cooking environment.

- Households’ desire to change are not based on health threat of smoke from cooking
- Households’ desire to change is based on soot deposits on the wall and ceiling of the kitchen, pots, and pans
- In general, households are not aware of health threat of smoke from cooking, but they do not like smoke and would like to see less smoke in the kitchen
- Buying new stove is low on the list of desire to change cooking environment
- Switching to LPG is also low on the list
Households Desire to Change Cooking Environment (Kitchen)

- Cleaner Kitchen Overall
  - First priority: 76%
  - Second priority: 8%
  - Third priority: 4%
  - No need to change: 12%
  - No opinion: 0%

- Kitchen Area to be more airy, brighter.
  - First priority: 57%
  - Second priority: 13%
  - Third priority: 5%
  - No need to change: 24%
  - No opinion: 1%

- Have concrete/cement floor
  - First priority: 39%
  - Second priority: 8%
  - Third priority: 9%
  - No need to change: 41%
  - No opinion: 4%

- More Space For The Cooking Area
  - First priority: 27%
  - Second priority: 16%
  - Third priority: 10%
  - No need to change: 47%
  - No opinion: 0%
Households Desire to Change Cooking Environment (Smoke & Soot)

- First priority
- Second priority
- Third priority
- No need to change
- No opinion

<table>
<thead>
<tr>
<th>Requirement</th>
<th>First priority</th>
<th>Second priority</th>
<th>Third priority</th>
<th>No need to change</th>
<th>No opinion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less Soot on ceilings &amp; Wall</td>
<td>54%</td>
<td>19%</td>
<td>10%</td>
<td>15%</td>
<td>2%</td>
</tr>
<tr>
<td>Less Smoke While Cooking</td>
<td>54%</td>
<td>24%</td>
<td>7%</td>
<td>14%</td>
<td>2%</td>
</tr>
<tr>
<td>Less Smoke When Starting Fire</td>
<td>53%</td>
<td>23%</td>
<td>7%</td>
<td>14%</td>
<td>3%</td>
</tr>
<tr>
<td>Less Soot on Pots and Pans</td>
<td>48%</td>
<td>27%</td>
<td>9%</td>
<td>14%</td>
<td></td>
</tr>
</tbody>
</table>
Households Desire to Change Cooking Environment (Stove & Fuel)

- **Switch to Charcoal**: 1%
- **Switch to LPG**: 8%
- **Buy New Stove**: 17%
- **Time Spent Collecting Firewood**: 30%

- First priority
- Second priority
- Third priority
- No need to change
- No opinion
Women of the households are the persons who decide to buy new stove.

- For lower cost of stove women can independently decide to buy a new one
- To purchase more expensive stove women have to consult with and/or make joint decision with the husband
- Household decision to purchase new stove reflects typical decision making process to buy small home appliance
Decision to Replace Old Stove

![Bar chart showing decision to replace old stove by material and household decision making pattern.

- Keren: 87% (Wife: 6%, Wife & Husband: 10%, Husband: 5%, Other: 15%)
- Mud & Brick: 38% (Wife: 42%, Wife & Husband: 3%, Husband: 42%, Other: 20%)
- Brick & Cement: 36% (Wife: 37%, Wife & Husband: 22%, Husband: 36%, Other: 31%)
- 1&2 Pot Holes: 20% (Wife: 34%, Wife & Husband: 31%, Husband: 20%, Other: 20%)
Decision to Purchase Home Appliance Costs less than Rp. 50,000

<table>
<thead>
<tr>
<th>Percent of Households</th>
<th>Husband</th>
<th>Wife</th>
<th>Husband &amp; Wife</th>
<th>Other Person</th>
</tr>
</thead>
<tbody>
<tr>
<td>All income</td>
<td>26%</td>
<td>20%</td>
<td>16%</td>
<td>19%</td>
</tr>
<tr>
<td>&lt; 1,041,668 Rp</td>
<td>48%</td>
<td>59%</td>
<td>57%</td>
<td>61%</td>
</tr>
<tr>
<td>1,041,668 - 1,499,999 Rp</td>
<td>26%</td>
<td>18%</td>
<td>72%</td>
<td>61%</td>
</tr>
<tr>
<td>1,500,000 - 2,024,999 Rp</td>
<td>21%</td>
<td>17%</td>
<td>16%</td>
<td>20%</td>
</tr>
<tr>
<td>2,025,000 - 3,199,999 Rp</td>
<td>25%</td>
<td>21%</td>
<td>11%</td>
<td>16%</td>
</tr>
<tr>
<td>&gt;3,200,000 Rp</td>
<td>20%</td>
<td>57%</td>
<td>26%</td>
<td>20%</td>
</tr>
</tbody>
</table>
Decision to Purchase Home Appliance Costs Rp. 50,000-200,000

Percent of Households

<table>
<thead>
<tr>
<th>Income Range</th>
<th>Husband</th>
<th>Wife</th>
<th>Husband &amp; Wife</th>
<th>Other Person</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rp 0-1,041,668</td>
<td>23%</td>
<td>18%</td>
<td>14%</td>
<td>17%</td>
</tr>
<tr>
<td>Rp 1,041,668-1,499,999</td>
<td>22%</td>
<td>14%</td>
<td>17%</td>
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</tr>
<tr>
<td>Rp 1,500,000-2,024,999</td>
<td>29%</td>
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</tr>
<tr>
<td>Rp 2,025,000-3,199,999</td>
<td>52%</td>
<td>52%</td>
<td>52%</td>
<td>52%</td>
</tr>
<tr>
<td>Rp &gt;3,200,000</td>
<td>2%</td>
<td>2%</td>
<td>2%</td>
<td>2%</td>
</tr>
<tr>
<td>All Income</td>
<td>54%</td>
<td>60%</td>
<td>54%</td>
<td>52%</td>
</tr>
</tbody>
</table>

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Thank You