Easy stove improvements

IFRC-SRU Conference

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Structure:

- Current Solution & Context statement
- Coal stove / Metallic box
- Two options & comparisons
- Open question
### Current solution statement

<table>
<thead>
<tr>
<th></th>
<th>Std. Family Tent</th>
<th>Winter-kit</th>
</tr>
</thead>
<tbody>
<tr>
<td>annual cons</td>
<td></td>
<td></td>
</tr>
<tr>
<td>kerosene lit</td>
<td>1773</td>
<td>1415</td>
</tr>
<tr>
<td>fuel cost</td>
<td>479</td>
<td>382</td>
</tr>
<tr>
<td>total heating hours</td>
<td>6056</td>
<td>5907</td>
</tr>
<tr>
<td>heating days</td>
<td>252</td>
<td>246</td>
</tr>
<tr>
<td>average power</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>max power</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td><strong>Balance cost 1 year:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tent</td>
<td>425</td>
<td>425</td>
</tr>
<tr>
<td>winter option</td>
<td></td>
<td>325</td>
</tr>
<tr>
<td>fuel cost</td>
<td>479</td>
<td>382</td>
</tr>
<tr>
<td>total</td>
<td>904</td>
<td>1132</td>
</tr>
</tbody>
</table>

#### Bar Chart

- **sdt tent**: 53%
- **winterkit**: 40%

<table>
<thead>
<tr>
<th>Power</th>
<th>Price</th>
<th>USD</th>
</tr>
</thead>
<tbody>
<tr>
<td>8KW</td>
<td>125</td>
<td>100</td>
</tr>
<tr>
<td>7.5KW</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Current solution statement

Emergency items catalogue

Volume 1

Search criteria for tent

[Search, Date range, Advanced search]

Volume 2

Search criteria for stove

[Search, Date range, Advanced search]

Volume 3

Search criteria for other items

[Search, Date range, Advanced search]

Shelter Research Unit

An initiative of the Benelex Red Cross Societies
Current solution statement

[Bar chart showing efficiency and price comparison for different fuels and heating methods, including Wood, Oil, Natural Gas, Kerosene, Paraffin Extra, Kerosene, Natural Gas, Gas, Propane, Gas/Electric, Kerosene, Kerosene, Kerosene, Kerosene, Kerosene, Kerosene, Kerosene, Gas, Gas, Gas/Electric, Propane, Propane, Propane, Propane, Propane, Wood.]
Metallic box / coal stove

- Common used coal stove in UB

<table>
<thead>
<tr>
<th>Component</th>
<th>Price</th>
<th>Volume</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metallic grid</td>
<td>30 USD per unit based</td>
<td>Height: 0.50cm</td>
<td>Weight: 20kg per unit without pipes</td>
</tr>
<tr>
<td>Box for ashes</td>
<td>in 10 units (immediate availability)</td>
<td>Width: 0.65m</td>
<td></td>
</tr>
<tr>
<td>Top door</td>
<td></td>
<td>Deep: 0.75m</td>
<td></td>
</tr>
<tr>
<td>Front door (ventilation)</td>
<td></td>
<td>Vol.: 0.24 m³</td>
<td></td>
</tr>
<tr>
<td>Metallic pipes</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Without modifications

- Stove with 8 kg one charge
Without modifications

Max. Interior temperature
31ºC after 45min

Min. Exterior temperature
-20ºC

Without modifications
Metallic stove

8kg coal
8kg coal 1 time

Stove no modification - comparison at h=0.50m

Temperature

05/02/2015 06/02/2015

Tent 3
Tent 8
Tent 9
Tent 10
Ext Temp

05/02/2015
06/02/2015
First option

- **Stove with bricks outside 8kg**
First option

With brick outside

More inertia

Bricks outside the stove

Max. Interior temperature

15°C after 90min

Min. Exterior temperature

-23°C

8kg coal

8kg coal 1 times

Temperature

Tent 10 at 0.50

Tent 9 at 0.50

Ext temp
Second option

- Stove with brick inside 4kg/4h
Second option

- More inertia
- Bricks inside the chamber
- Max. Interior temperature: 22°C after 80 min
- Min. Exterior temperature: -23°C

With brick inside:

- 8 kg coal
- 4 kg coal 2 times

Graph showing temperature variations with and without bricks in the chamber.
Recap options for the tent 10

Summary of the 3 options for tent 10

- 22°C after 45min
- 15°C after 90min
- 18°C after 60min

Summary

Temperature

- Ext.Temp.
- Brick inside
- Brick outside
- Without brick

8kg coal
1 time

4kg coal
2 times
Easy local solution to have better and effective results
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