Kerala State Energy Conservation Sensitisation Programme
Malabar Breweries
Who we are:

About SABMiller PLC:

• We are UK based MNC and are the Second Largest Brewer in the world.

• SABMiller is in the beer and soft drinks business, bringing refreshment and sociability to millions of people all over the world who enjoy our drinks. **We do business in a way that improves livelihoods and helps build communities.**
Where we operate:

- SABMiller is a FTSE-20 company, with shares trading on the London Stock Exchange, and a secondary listing on the Johannesburg Stock Exchange. We have around **69,000 employees** in more than **80 countries**, from Australia to Zambia, Colombia to the Czech Republic and South Africa to the USA.
About SABMiller India Ltd:

- SABMiller entered the Indian market in the year 2000 by acquiring Narang breweries and has since acquired several breweries and brands.
- Our brands are Peroni, Indus Pride, Miller High life, Fosters, Haywards 5000, KO, Royal challenge.
- Our Sustainability development programme is **Prosper**. This has five shared imperatives:
  - A Thriving World
  - A Sociable World
  - A Resilient World
  - A Clean World
  - A Productive World
We understand that our profitability depends on healthy communities, growing economies and the responsible use of scarce natural resources. We integrate these issues into our business through our five shared imperatives.
A Thriving World: Accelerating growth and social development in our value chains

- Saanjhi Unnati
- Malt Barley Development Programme.
- Project Humsafar

A Sociable World: We want a sociable world where our beers are developed, marketed, sold, and consumed with high regard for individual and community wellbeing. Make beer the natural choice for the moderate and responsible drinker

- Respect the Road – Don't drink & Drive Campaign
- Traffic Tau – Road Safety Mascot
A Clean World: Create value through reducing waste and carbon emissions.

- By 2020, our target is to:
- Reduce the carbon footprint per litre of beer across our value chain by 25%* including:
  - 50% reduction within our breweries
  - 25% reduction in packaging carbon footprint
  - 25% reduction in refrigeration carbon footprint

🌟 Has reduced 35% on the same by 2015!!!!!!!!!!!!!!
A Productive World: We want a productive world where land is used responsibly, food supply is secure, biodiversity is protected and our crops can be accessed at reasonable prices.

- Ensure the sourcing of brewing crops measurably improves both food security and resource productivity:
  - Improve the barley grown per hectare, while reducing inputs such as water, energy and fertilizer, in key growing areas
- Improve productivity of other key brewing crops where we have influence
- Improve food security for small-scale farmers who supply us in emerging markets by helping them increase their incomes and food production
About Malabar Breweries:

- The Malabar unit had commenced its operation on September 2003 with a view to cater the Kerala Market.

- The unit has a manufacturing capacity of 14040KL of bottled beer per year.

- Received 2nd, 3rd and 3rd place in State pollution Control Awards (Large scale industries) from Kerala State Pollution control board for making substantial and sustained efforts in pollution control activities from the year 2008, 2012 & 2015 respectively.

- Received Certification of merit under Medium Scale Category for the Kerala State energy Conservation Award-2013-14.
BREWING PROCESS

Grist Case

Adjuncts-Rice / Maize added

Mash Kettle – Mashing

Brewing water

Mash

Adjuncts-Sugar & Hops added

Lauter Tun – Lautering

Wort Kettle – Wort Boiling

Wort

Whirl Pool - Boiled wort rested

Hot Wort

Clear Hot Wort

Filtration Unit

Fermenter – Fermentation / Maturation

Green / Matured Beer

Yeast + Air

Bright Beer Tank

Trap Filter

Carbonation

Bright Beer to Bottling

Wort Cooler – Wort Cooling

Cold Wort

Yeast Collect or off.
PACKAGING PROCESS

Trucks → Empty Bottle Store (Yard) → Transfer to Packaging Hall → Bottle Washing

The journey of bottle in plant

Washed Bottle Inspection → Pasteurization → Filled Bottle Inspection

Filled Bottle Inspection → Filling & Crowning → BBTs

Labeling → Label Inspection

Label Inspection → Caser → Palletizing → Trucks
BEER MANUFACTURING PROCESS

BREWING PROCESS
- Steam @ 1.5 Bar
- Treated Water
- Refrigeration
- Air Supply
- Electric Power

PACKAGING
- Steam @ 2 bar
- Treated Water
- Air Supply
- Electric Power
- Refrigeration
Steam:

How we can generate:
1. Electrical Energy.
2. Using Petroleum product (Diesel, Furnace Oil).
3. Coal and other Fossil Fuel.

Other Alternative – Non Fossil fuel….
1. Wooden Waste.
2. Agro Waste and
3. By product of certain industries…
### Business Case: To replace oil fire Boiler to Solid Fuel Boiler:

#### Financial comparison - 6 TPH FO VS Solid fuel Fired Boiler

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Description</th>
<th>Unit</th>
<th>Solid fuel</th>
<th>FO Fired</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Boiler &amp; Acessories</td>
<td>Rs</td>
<td>96263014.71</td>
<td>28034640.23</td>
</tr>
<tr>
<td>2</td>
<td>Civil, Electrical &amp; Piping Cost</td>
<td>Rs</td>
<td>28500000</td>
<td>12500000</td>
</tr>
<tr>
<td>3</td>
<td>Total Capital Cost</td>
<td>Rs</td>
<td>124763014.7</td>
<td>40534640.23</td>
</tr>
<tr>
<td>4</td>
<td>Total Capital Cost</td>
<td>US$</td>
<td>2079383.6</td>
<td>675577.3</td>
</tr>
</tbody>
</table>

#### Fuel Cost

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Description</th>
<th>Unit</th>
<th>Solid fuel</th>
<th>FO Fired</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Average Steam Load</td>
<td>kg/h</td>
<td>10500</td>
<td>10500</td>
</tr>
<tr>
<td>6</td>
<td>Efficiency of Boiler</td>
<td>%</td>
<td>70%</td>
<td>87%</td>
</tr>
<tr>
<td>7</td>
<td>Annual Operating Hours</td>
<td>hours</td>
<td>7200</td>
<td>7200</td>
</tr>
<tr>
<td>8</td>
<td>Fuel Consumption</td>
<td>kg/h</td>
<td>2733</td>
<td>753</td>
</tr>
<tr>
<td>9</td>
<td>Cost of fuel</td>
<td>Rs. /kg</td>
<td>6</td>
<td>55</td>
</tr>
<tr>
<td>10</td>
<td>Total Cost of Fuel</td>
<td>US$/Yr.</td>
<td>1967625</td>
<td>4966734</td>
</tr>
</tbody>
</table>

#### Operating Cost

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Description</th>
<th>Unit</th>
<th>Solid fuel</th>
<th>FO Fired</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Electricity Consumption</td>
<td>Kwh/hr</td>
<td>89</td>
<td>32</td>
</tr>
<tr>
<td>12</td>
<td>Cost of Steam utilised for heating FO</td>
<td>US$/Yr.</td>
<td>0.00</td>
<td>9138.46</td>
</tr>
<tr>
<td>13</td>
<td>Annual Power Cost</td>
<td>US$/Yr.</td>
<td>64080</td>
<td>23192</td>
</tr>
<tr>
<td>14</td>
<td>Annual man power cost</td>
<td>US$/Yr.</td>
<td>54400</td>
<td>19200</td>
</tr>
<tr>
<td>15</td>
<td>Annual Maintenance &amp; Ash Handling Cost</td>
<td>US$/Yr.</td>
<td>68000</td>
<td>19000</td>
</tr>
</tbody>
</table>

Cost saving per Annum  US$/Yr.  2874021.59  ROI Less than a Year
Case Study1.

Installation and Commissioning of 6TPH SCADA based Biomass Boiler.

Category: Up gradation/New Technology

Make: Thermax Ltd

Cap: 6 TPH @10.5 kg/cm² MCR

Investment: Rs 591 lacs

Features:

- Fully Automated with SCADA.
- Fully Automated Combustion Control System with interlocking with O2 analyzer.
- All fans and Feed water Pumps provided with VFDs.
- Auto blowdown Control mechanism.
- Fitted with Economizer for improved efficiencies.
- Auto feed water Level Controls
Boiler P & ID
## Specific Energy Consumption - Last 4 Years

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total annual Manufacturing Cost in Rs. (lakhs)</td>
<td>1691</td>
<td>1894</td>
<td>2253</td>
<td>2405</td>
</tr>
<tr>
<td>Total Annual Energy Cost in Rs. (lakhs)</td>
<td>397.27</td>
<td>412.47</td>
<td>330.07</td>
<td>172.68</td>
</tr>
<tr>
<td>Energy Cost as % of Production cost</td>
<td>23.4</td>
<td>21.7</td>
<td>14.64</td>
<td>7.18</td>
</tr>
<tr>
<td>Total Energy MJ/HL</td>
<td>318</td>
<td>315</td>
<td>306</td>
<td>300.5</td>
</tr>
</tbody>
</table>

### Financial Benefits

- Energy Cost Reduced to 47% even on increase in the Manufacturing.
## Financial Benefits

### Return on Investment: Commercial /Financial Returns

<table>
<thead>
<tr>
<th>Year</th>
<th>FO(Ltrs)</th>
<th>FO Per Ltr Cost</th>
<th>FO Total Cost</th>
<th>HSD(Ltrs)</th>
<th>HSD Per Ltr Cost</th>
<th>HSD Total Cost</th>
<th>Briquette(Kgs)</th>
<th>Briquette Cost/Kg</th>
<th>Briquette Total Cost</th>
<th>Total Cost(Rs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011-12</td>
<td>575280</td>
<td>38</td>
<td>21860640</td>
<td>0</td>
<td>44.5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>21860640</td>
</tr>
<tr>
<td>2012-13</td>
<td>232992</td>
<td>53</td>
<td>12348576</td>
<td>315627</td>
<td>44.5</td>
<td>14045402</td>
<td>0</td>
<td>12348576</td>
<td>0</td>
<td>26393978</td>
</tr>
<tr>
<td>2013-14</td>
<td>257074</td>
<td>53</td>
<td>13624922</td>
<td>0</td>
<td>53.4</td>
<td>0</td>
<td>969049</td>
<td>6</td>
<td>5426674</td>
<td>19051596</td>
</tr>
</tbody>
</table>

**Graph:**
- **2011-12:** 218.6
- **2012-13:** 263.9
- **2013-14:** 190.5

### Total Cost for Steam Generation

- **2011**: Rs 21860640
- **2012**: Rs 26393978
- **2013**: Rs 19051596
### Return on Investment: Commercial /Financial Returns

#### After Installation and Stabilization:

#### Fuel Consumed for Steam Generation

<table>
<thead>
<tr>
<th>Year</th>
<th>FO (Ltrs)</th>
<th>FO Per Ltr Cost</th>
<th>FO Total Cost</th>
<th>HSD (Ltrs)</th>
<th>HSD Per Ltr Cost</th>
<th>HSD Total Cost</th>
<th>Briquette (Kgs)</th>
<th>Briquette Cost/Kg</th>
<th>Briquette Total Cost</th>
<th>Total Cost for Steam Generation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014-15</td>
<td>1766</td>
<td>48</td>
<td>84768</td>
<td>0</td>
<td>48</td>
<td>0</td>
<td>118360.8</td>
<td>5.6</td>
<td>6628170.08</td>
<td>6712938</td>
</tr>
</tbody>
</table>

#### Total Cost for Steam Generation

**Rs Lacs**

- **2011-12**: 218.6
- **2012-13**: 263.9
- **2013-14**: 190.5
- **2014-15**: 67.1

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**Financial Benefits**
Return on Investment: Environmental Aspects - Redn in Carbon Emissions

### Carbon Emissions for Steam Generation

<table>
<thead>
<tr>
<th>Year</th>
<th>FO(Ltrs)</th>
<th>Energy MJ/lt @9200 Kcal/Ltr</th>
<th>Total Energy on FO</th>
<th>Carbon Emissions @0.0738 Kg Co2E /MJ</th>
<th>HSD(Ltrs)</th>
<th>Energy MJ/lt @8800 Kcal/Ltr</th>
<th>Total Energy on HSD</th>
<th>Carbon Emissions @0.0740 Kg Co2E /MJ</th>
<th>Carbon Emissions KG CO2 E</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011-12</td>
<td>575280</td>
<td>38.64</td>
<td>22228819</td>
<td>1640487</td>
<td>0</td>
<td>36.54</td>
<td>0</td>
<td>0</td>
<td>1640487</td>
</tr>
<tr>
<td>2012-13</td>
<td>232992</td>
<td>38.64</td>
<td>9002811</td>
<td>664407</td>
<td>315627</td>
<td>36.54</td>
<td>11533011</td>
<td>853443</td>
<td>1517850</td>
</tr>
<tr>
<td>2013-14</td>
<td>257074</td>
<td>38.64</td>
<td>9933339</td>
<td>733080</td>
<td>0</td>
<td>36.54</td>
<td>0</td>
<td>0</td>
<td>733080</td>
</tr>
<tr>
<td>2014-15</td>
<td>1766</td>
<td>38.64</td>
<td>68238</td>
<td>5036</td>
<td>0</td>
<td>36.54</td>
<td>0</td>
<td>0</td>
<td>5036</td>
</tr>
</tbody>
</table>

### Financial Benefits

**Emissions ~ NIL**

✓ In line with our Sustainable Development initiatives.

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**Co2 E (Lac Kgs)**

- 2011-12: 164.0
- 2012-13: 152.0
- 2013-14: 7.3
- 2014-15: 0.1
Case Study 2: Installation of Heat Exchanger in Pasteurizer and Re-modification of Condensate Recovery System.

Category: Innovation

- Make- HRS Process Systems
- Investment Cost: Rs 7.08 Lacs

Design Philosophy of Tunnel Pasteurizer: Pasteurizer is an equipment in packaging used to Pasteurize Beer Bottles (i.e. increasing temp gradually from 8 deg to 62 deg and then cooling it down to ambient).

The medium of heating is Direct Steam Injection by use of Steam injectors.

Design Issues:

- No arrangement of Condensate recovery, hence energy loss.
- No accurate temp control of Bottles, resulting in higher bottle breakage.
Innovation Done:

- Modified the Steam line so as to accommodate Heat Exchanger in all the steam heating zones.
- Better temp Control since the Heat Exchanger Steam valve controller is controlled by the water temp not steam temperature.
Financial Returns:

1. On account of savings in Fuel Cost: Rs 2.56 Lacs PA

<table>
<thead>
<tr>
<th></th>
<th>Before Modification</th>
<th>After Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Condensate Recovery % age</td>
<td>69.3</td>
<td>92.3</td>
</tr>
<tr>
<td>Average Feed Water Temp Deg C</td>
<td>68.6</td>
<td>83.2</td>
</tr>
<tr>
<td>Avg per day Fuel(Briquette) Consumption Kgs</td>
<td>6100</td>
<td>5948</td>
</tr>
</tbody>
</table>

Savings in Fuel 151.6 Kgs
For 300 days 45478.13 Kgs PA
At Rs 5.65/kg 256951 Rs 2.56 Lacs PA

2. On account of savings in reduced Bottle Loss due to accurate Temp Profile
   ✓ PY Bottle Loss: 1.2 % After Modification: 0.8 %
   ✓ Savings of Rs 2.5 lacs (@ 13.05 Lacs Cases and Rs 4 Avg. Bottle Cost)
Unit: Malabar Breweries
Major Energy Conservation Activities
3. Provision of a Air Blower for transferring Spent Malt to eliminate Compressed Air usage.

- Make- USHA
- Investment Cost: Rs 3.37 Lacs
- Eliminated the usage of Compressed Air @ 6 bar (37 KW to 18.75 KW for 3 Hrs., i.e. ~56 KWH/day)
- Savings of 56 KWH/day, about 16800 Units Annually for 300 working days.(0.17 MU/Rs 0.95 Lacs)

4. Replacement of 25 Nos. Streetlight fittings from 250 W to 85 W CFL and 50 Nos. Tube fittings of 40W/36W to 28W T5

- Investment Cost: Rs 2 Lacs
- Savings :0.014 MU (Rs 0.83 Lacs)
Utilization of Methane gas generated from Bioreactor in ETP to Boiler Steam Generation.

- **Phase 1st**: Revamping of the ETP with installation of more efficient Bioreactor (Membrane Type).
  - Investment Cost: Rs 93 Lacs
  - Approx. 700 NM3/day gas generation is envisaged on peak production volumes.

- **Phase IIInd**: Provision for the Methane Generated in UASB to Boiler as secondary fuel.
  - OEM- M/s Thermax preparing the feasibility study for the mechanism of burning the gas, either by Burners or through nozzles.
  - Based on the study, the project shall be undertaken from the HO-Engineering.
# Unit: Malabar Breweries
## Major Energy Conservation Activities - Last 3 Years

<table>
<thead>
<tr>
<th>Sno</th>
<th>Project Initiatives</th>
<th>Project Cost Rs Lacs</th>
<th>Energy Savings</th>
<th>Cost Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Fuel</td>
<td>Electricity</td>
</tr>
<tr>
<td>-----</td>
<td>---------------------</td>
<td>----------------------</td>
<td>----------------</td>
<td>-------------</td>
</tr>
<tr>
<td>2013-14</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Installation on new 6 TPH Briquette Boiler with SCADA based PLC operation.</td>
<td>591.11</td>
<td>500000 Ltrs of FO PA</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Installation of Heat Exchanger at 45 Deg Zone Pasteurizer and re-modification of Condensate Recovery Line.</td>
<td>7.08</td>
<td>45000 Kg of Briquette PA</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Provision of Air Blower for Spent Grain Pushing to eliminate compressed air usage from Air Compressors.</td>
<td>3.37</td>
<td>0.017 MU</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Changing of Street light fitting from 250W to 85W CFL and 40W/36W tube light to 28W T5 fitting</td>
<td>2.00</td>
<td>0.014 MU</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOTAL INVESTMENT</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sno</th>
<th>Project Initiatives</th>
<th>Project Cost Rs Lacs</th>
<th>Energy Savings</th>
<th>Cost Savings</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Fuel</td>
<td>Electricity</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2012-13</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Additional Insulation for Washer and Pasteurizer with 19 MM thk Nitrile Rubber.</td>
<td>2.01</td>
<td>6372 Ltrs of FO PA</td>
<td></td>
</tr>
</tbody>
</table>
SABMiller follows **Manufacturing Way (M-WAY)** for World Class Management

- We practice 10 foundation practices such as 5S, Team Work, Visual Performance Management, Focused Improvement, Autonomous Maintenance, Asset Management, Quality Management, Manufacturing Flexibility, Health Safety Management, Environment Management
- Under the Foundation Practice FI we have My idea scheme.
- “My Idea” scheme runs to capture ideas and suggestions from employee in the plant. Idea can be submitted by anyone in the plant including contract employees.
- Rewards and recognition for those who submits the ideas and monthly best ideas.
- Yearly 3 best idea selected nationally and rewarded in annual technical conference.
<table>
<thead>
<tr>
<th>Sl no</th>
<th>My Idea</th>
<th>Submitted by</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>To provide on valve at the entry of air line of brew house. So when brew is not happening can close the same and will avoid air loss</td>
<td>Ramkumar</td>
</tr>
<tr>
<td>2</td>
<td>To connect the pipe line of secondary and primary glycol tanks. This will ensure the same level in both the tanks and thus avoid air pick up by motor</td>
<td>Renjith K.R</td>
</tr>
<tr>
<td>3</td>
<td>To use the Dust generated from Malt milling and barley milling in Briquetter boiler as biomass fuel</td>
<td>Sumit Suresh</td>
</tr>
<tr>
<td>4</td>
<td>Reduce the air compressor setting from current 6.6 / 6 bar to 6 / 5.5 bar for process and packaging in the existing condition. Further when only one process is operating change the setting to 5 / 4.5 bar</td>
<td>Raju V.K</td>
</tr>
<tr>
<td>5</td>
<td>To reduce the Co2 counter pressure 1.25 Kg/cm2 to 0.8 kg/cm2 from filler to BBT for beer pushing</td>
<td>Jayan K.N</td>
</tr>
<tr>
<td>6</td>
<td>Extend the glycol return line from hot well to cold well to maintain a common tank. This will help to maintain the glycol level and will get sufficient suction pressure. We can run VFD controlled 40 HP pump</td>
<td>Reghu M.G</td>
</tr>
<tr>
<td>7</td>
<td>To provide change over switch to 40 HP spare motor in glycol line to reduce the power consumption</td>
<td>Reghu</td>
</tr>
<tr>
<td>8</td>
<td>To provide a line from PSF tank outlet line to overhead tank outlet line directly so we can avoid the running of filter water feed pump. Existing filter water pump is 37 M head and PSF feed pump is 50 M head</td>
<td>Praveen</td>
</tr>
<tr>
<td>9</td>
<td>To provide a timer for the ETP roots blower and it can automatically cut off and we can save 18.50 kw per hour as per the DO meter</td>
<td>Raju V.K</td>
</tr>
</tbody>
</table>
# My Idea Sheet - Malabar

My idea is To extend the glycol return line from hot well to cold well to maintain a single tank, which would enable to maintain a sufficient glycol level and help us to run the VFD operated glycol pump.

<table>
<thead>
<tr>
<th>BEFORE</th>
<th>AFTER</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2 nos Primary Glycol Pump and 2 nos secondary glycol pumps were being operated with a combined operating load of 11 Kw x 2 nos and 7.5 x 2 nos = 29.6 Kwh.</strong></td>
<td><strong>After VFD operated Glycol pump, only one pump with 30 Kw, i.e. 25.5 KWH is being used. Hence savings of 208 Units/day.</strong></td>
</tr>
</tbody>
</table>

**Benefit:**
- **Power Consm at Before integration of Ht & Cold well:** 473 Kw/h/day
- **After Integration:** 265 Kw/h/day
- **Savings:** 208 Kw/h/day
- **For 300 working days:** 62400 Kwh
- **Savings in MJ:** 19094400 MJ Anually
- **Savings in Cost @ Rs 5.6/Kwh:** 349440 Rs Anually

**Brewery award winning idea**

**Start Date:** 25/7/2014

**Finish Date:** 18/8/14

**Name:** K N Raju

**Affordability**

**Availability**

**Admirable**
Innovative Ideas and Suggestions – FIP

Sibil with Technical Director – Mr. Martin and Supply chain Director – Mr. K.S. Pande
Training Programme in Energy Conservation for Staff

- Internal Training Imparted for Boiler Operation Control to Boiler Associates.
- Internal training for SIC(Short Interval Control) in Refrigeration Process to Refrigeration Associates and Utility Executives by HO-Engineering.
- On Job training by KSPC.
Benefits from these Project

- **Social well being:** The project activity will generate additional source of income for the farmers/ small scale suppliers selling biomass residues in the region.

- **Economic well being:** With this project being implemented other brewery units in the country will be encouraged to explore energy efficiency technology leading to conservation of energy and new investment.

- **Environmental well being:** The implementation of the project activity will reduce pollution load in the locality from substitution of FO and flaring of biogas.

- **Technological well being:** The project activity is going for technology change compared to the conventional technology. Hence the project activity will lead to enhancement of technical skills of the employees and their ability to learn about new technologies.