CIRCULAR ECONOMY @ AB-INBEV

Recube Circular Solution Pvt Ltd
www.recube.co.in

Summary

> Upgrade the use of brewer's spent grain (BSG) by adapting it to make high value durable products relevant for the beer industry

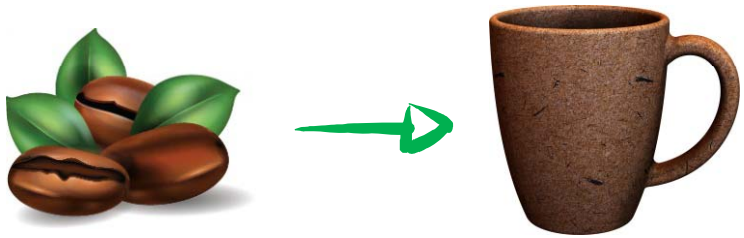
Barley Spent Grain (BSG) is a large by product from brewing. There are multiple ways of consuming this like cattle feed and for making fertilizer products. However the resulting end-product is a "down grade" to the inherent natural properties of BSG.

We experimented by "polymerizing" dry barley husk and successfully made durable products like beer buckets and glasses. BSG's inhrent lignocellulosic properties give it an earthy appearance and natural fibres give it good oxidation and thermal properties.

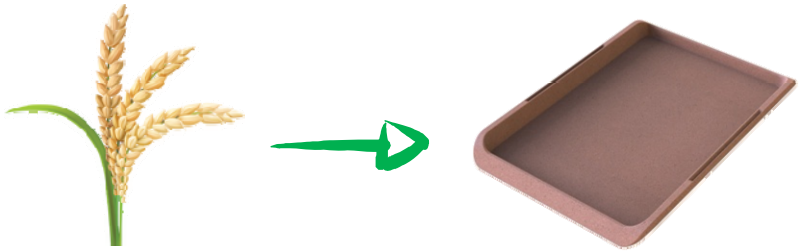
Our process is scaleable to consume more than few thousand tonnes per annum and produces a range of value added products relevant to the beer industry. Purchasing BSG from ABInbev at the tendering rate we can recoup all costs through multiple items required in ABInbev's supply chain.

We specialize in using agro waste to make durable products

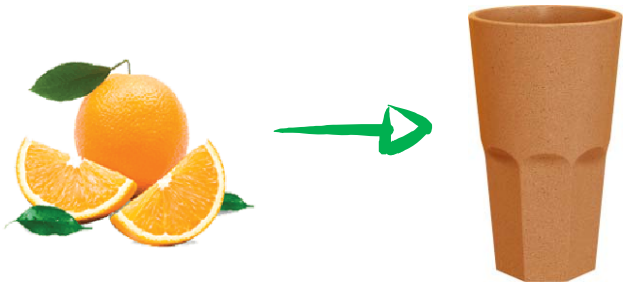
Actual Products



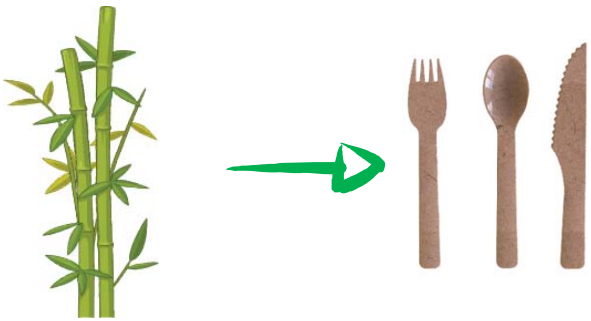
Coffee husk to make coffee mugs



Rice husk to make F&B serving trays



Orange peels to make lemonade glasses



Bamboo fibres to make cutlery

Barley Spent Grain is a huge by product of brewing

1 litre beer

→ **200gms BSG**

Of which 70% to 80% is water

BSG is mostly used as a fertilizer for crops, fodder for cattle, fuel for furnaces and sometimes a filler for paper pulp making

Barley Husk as well as Barley Spent Grain have inherently good properties

Husk

BSG

Natural Appearance

Lignocellulosic nature makes products look natural and environment friendly

Antioxidant properties

Inhibits oxidation due to presence phenolic and free radical scavenging compounds.

Thermal properties

Presence of natural phenolic compounds helps make products more stable at higher temperatures.

Our process can utilize both barley husk and spent grain

1

Barley Husk

→ **Husk**

1 ton per day

2

BSG Small

AB InBev → **BSG**

500 kg per day*

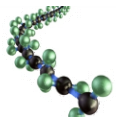
3

BSG Large

AB InBev → **BSG**

20 ton per day*

Ground Waste



Compound Making

Molding

Cheers

* Output of Dried BSG. Input would be approx 4 times of output

Polymerization has multiple advantages over other forms of handling BSG

01

Upgrading Waste
More than just
fodder or fertilizer

02

Scalable
Can easily consume
over 3000 Tons

03

PR Mileage
Strong sustainability
story along with
carbon sequestration

04

Brand Building
Revenue Generation
capabilities

05

Wide Application
Use in core areas of
own supply chain

BSG will be used to make relevant products for the beer industry

No. of pieces per 1 Ton of BSG

Drinking Glasses*
Confirms to EU norms for food safety, Washable and reusable
60000 pcs

Bottle Crates for pints
Washable and reusable, Branded as per requirements
15000 pcs

Pallets for barrels - 120
Sturdy strong pallets to transport beer drums
120 pcs

Bottle Chillers*
Washable and reusable, Branded as per requirements
6000 pcs

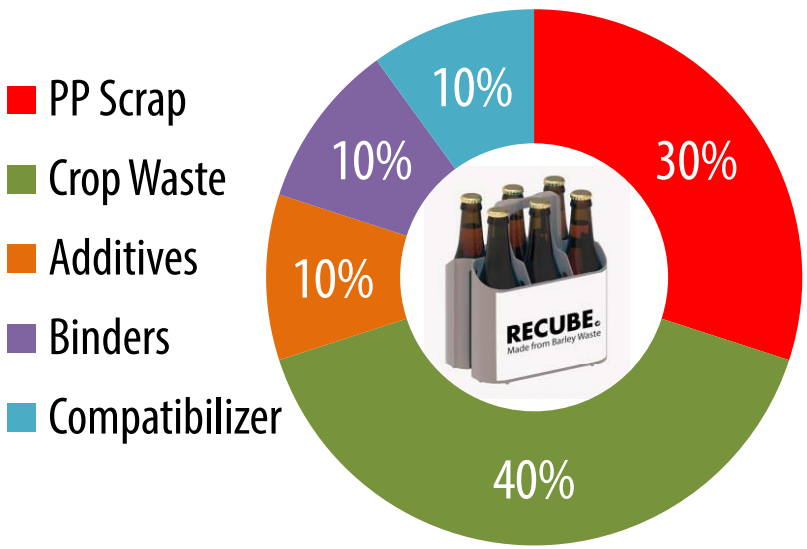
Large Crates
Washable and reusable, Branded as per requirements
1500 pcs

Cutlery*
Confirms to EU norms for food safety, Compostable as per ISO 17088
3 lakh

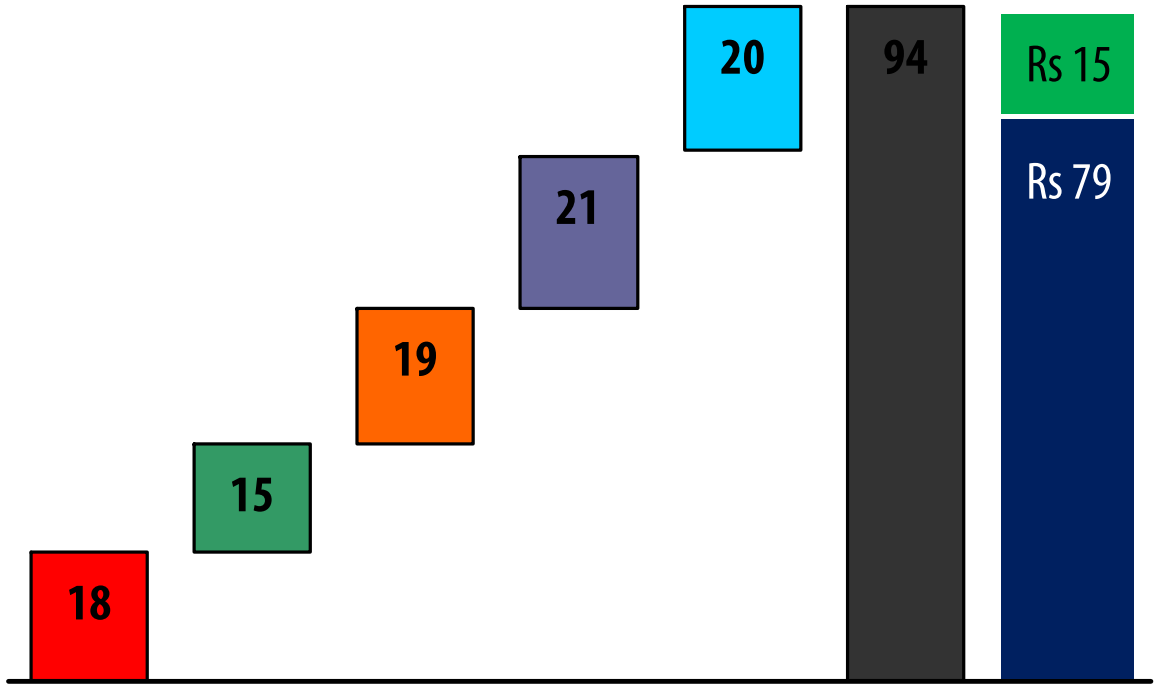
***Actual Products**

Using Abi's own BSG will reduce the cost of basic raw material

% by weight



Rs per kg, Cost Breakup



Made from packaged water bottle cap waste and BSG, Weight of crate – 1000gms for calculation

Using Abi's own BSG for events helps cost savings of Rs 3.0 lakh per event

Selling Price at Event	**Rs 50**
Recube Price to Agency	**Rs 30**
Using BSG from ABI	**Rs 3**
+ Partnership Saving	**Rs 3**
Savings per cup	**Rs 6**
Saving per event	**Rs 3lakh**

Material Cost-70%, Conversion Cost-30%,
Recyclable PP - 4.00, Crop Waste - 3.00, Additives - 4.00, Binders - 5.00, Compatibilizer - 5.00, Conversion cost - 9, Total Cost - 30.00

Rice husk based glasses for U2 Concert in Mumbai

Case Example 1

Crop Waste:

Rice Husk

Project:

100000 tumblers made from crop waste sourced from farmers in Maharashtra for a concert to be held in Mumbai

Impact:

The project not only helped cut out single use plastic but also helped prevent a farmer from burning few tones of rice waste

Compostable Cutlery for an F&B client in India

Case Example 2

Crop Waste:

Wheat Ground

Project:

Cutlery made from wheat ground from the same vendor who makes the clients bread

Impact:

A complete circular economy implementation where crop waste is again used inside the F&B outlet

Approved for compost ability as per ISO 17088

Crop waste material
As a home ware retail brand

Case Example 3

Crop Waste:

Multiple Sources



Project:

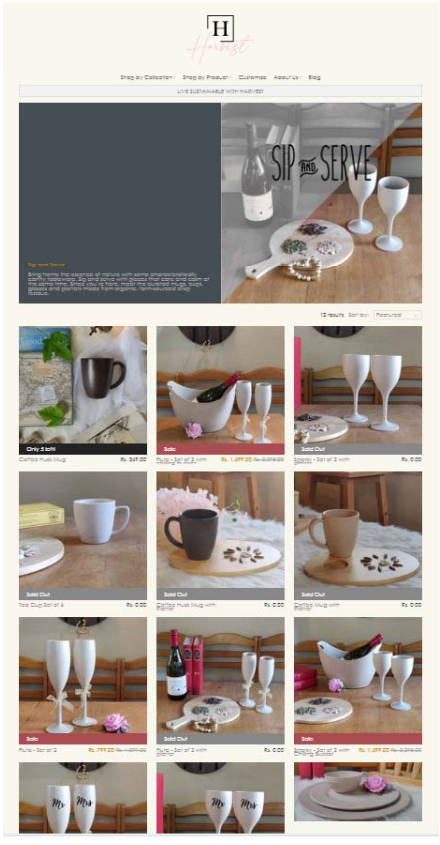
Our online retail store for home ware products which has products made from multiple crop wastes

Impact:

Establishes direct contact with farmers to make sustainable products available to Indian consumers at affordable prices

Harvest

www.theharvest.store



Taking it forward

Step 1:

Aug 1st week

Use barley from farmers near AbInbev brewery in Karnataka

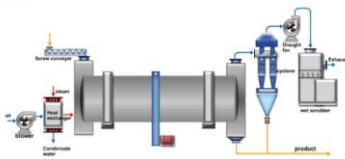
Step 2:

Aug 2nd week

Use BSG from AbInbev brewery in Mysore. Analyze for BSG dryer and make samples.

Step 3:

Aug 3rd week



Based on results in step 2, decide on configuration of BSG dryer, location and downstream equipment details.

Our Team

High on food and more ;)

Purav, 23
Refill Solutions

Lokesh, 23
Large Events Marketing

Beer Drinker

Nishith, 36
Manufacturing

Rahul, 26
F&B Marketing

Does not like
Eating out

Likes Eating Out

Mahadev, 45
Raw Material Expert

Anu, 34
Marketing and PR

Non Beer Drinker

Annexure

Crop waste works well with hot coffee, cold beverages, alcohol and also in dishwashers

ACTUAL PRODUCTS TESTED

Cold Beverages

Tested @ 4 Deg C for 4 hours

Hot Beverages

Tested @ 100 Deg C for 4 hours

Alcohol

Tested with Ethanol @ 100 Dec C for 4 hours

Dishwasher

Tested for 50 cycles

Biodegrability

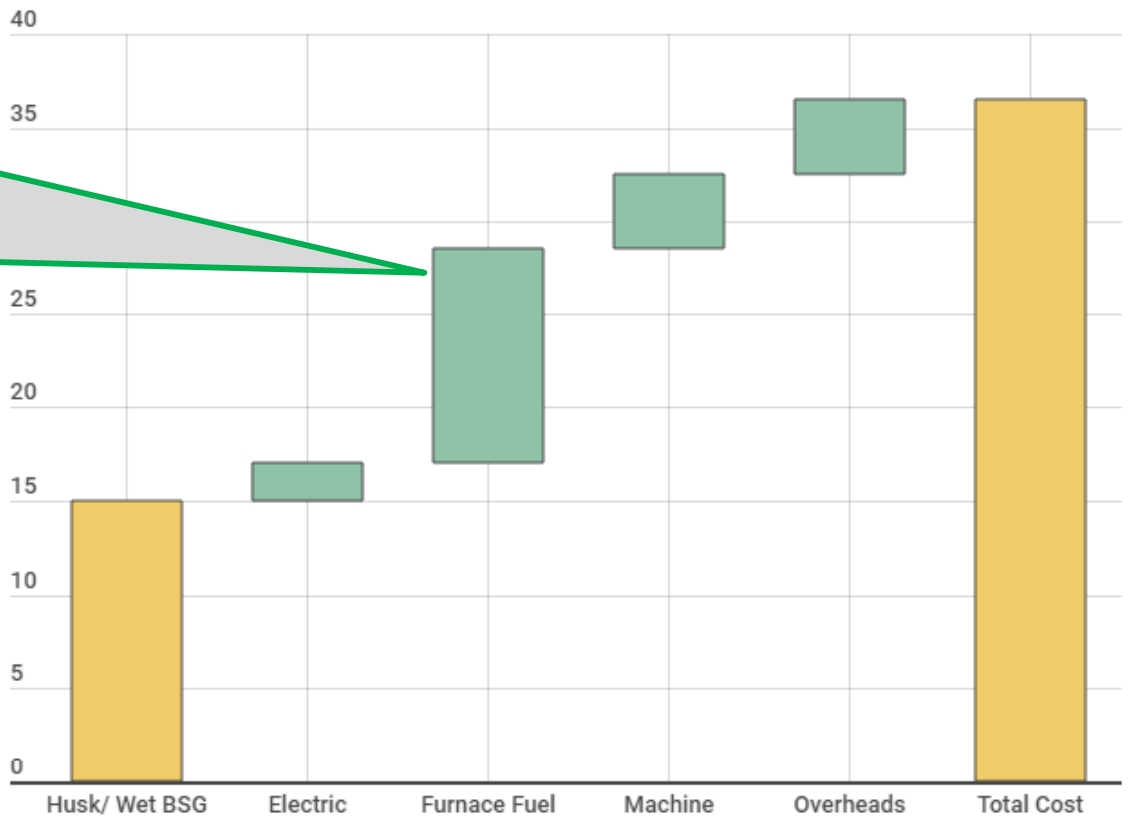
Tested as per ISO 17088

BSG Drying is a power intensive process but can be made economical using solar

We have assumed purchase cost of barley husk and tendering cost of BSG waste @ Rs 15 per kg

Cost per Kg

Using solar power this can be further reduced



Rice Husk crop waste prevents burning and helps contain C02 emissions

Reduction in carbon emissions for each 2/3 airline tray

= 100gms Co2 saved*

* Weight of tray assumed to be 200gms; Carbon content in rice husk 38%, Molecular mass of Carbon Dioxide 44kg, atomic mass of carbon 12kg

Creating Value from BSG

BIRAC BIG START
AB InBev
RECUBE.
www.recube.co.in

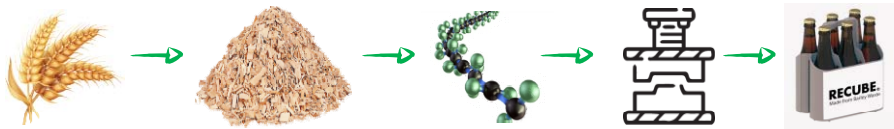
What we do?

We specialize in using agro waste like rice husk, barley husk and wheat waste to make durable end products

Coffee husk to make coffee mugs

How we do it?

We dry, grind and then polymerize crop waste to make bio compounds that can be molded in different shapes



Crop Waste → Dry & Grind → Polymerize → Mold → Product

Why does it make sense for Abi

Brewing generates large amount of BSG (approx 3000Tpa).

→ Our polymerization process is scalable to consume large amounts of BSG and flexible to make a range of products relevant to the beer industry

→

Consume more than 1000tpa

Cost Savings through scale within 1 year

Move to a circular economy

Make value added products

When can we start?

Aug 1st week

Use barley from farmers

Aug 2nd week

Use BSG from AbInbev brewery in Mysore

Aug 3rd week

Configuration of BSG dryer & down-stream equip details

Who are we?

We are a group of environment and design enthusiasts with expertise in making bio based raw materials & designing/manufacturing molded products. Through our solutions we help companies to move towards a circular economy based operating model.

1. Purav Desai
2. Nishith Jardosh
3. Lokesh Sambhavni
4. Mahadev Chikkanna
5. Rahul Batra
6. Anupriya Nayyar