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## Company Profile



**Pep+ aims to invest in building a stronger and more resilient business, and we are focused on three interconnected pillars with ambitious goals.**

- Entered India in 1989
- One of the largest food and beverage businesses in India.
- Diverse portfolio / iconic brands like Pepsi, Lay's, Kurkure, Tropicana, Gatorade and Quaker.
- Over the last three decades, supported 118,000 people and developed a strong backend link with over 27,000 farmers across 14 states in the country.



**Positive Agriculture**

We are working to source our crops and ingredients in ways that restore the earth and strengthen farming communities.



**Positive Value Chain**

We are helping to build a circular and inclusive value chain.



**Positive Choices**

We are inspiring consumers through our brands to make choices that create more smiles for them and the planet.

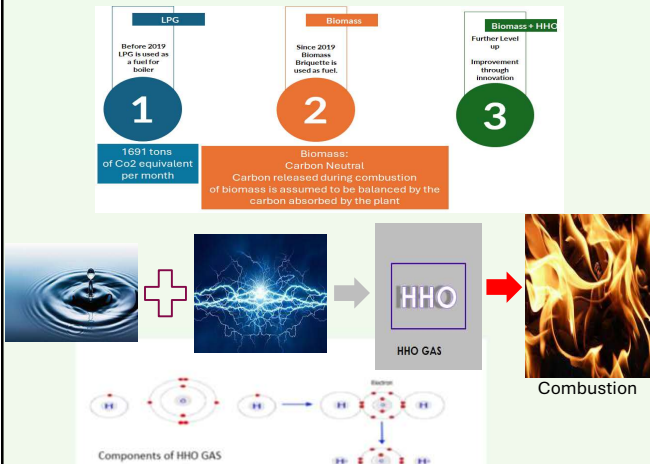
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## Project Background

### Area of Project

PepsiCo Channo uses biomass-fired boilers for steam generation due to the economic and renewable nature of biomass fuel. (15TPH x 2 Nos Make: Forbesvyncke).



Water is split into hydrogen gas (H<sub>2</sub>) and oxygen gas (O<sub>2</sub>) in 2:1 ratio using an electrical current:  $2\text{H}_2\text{O} \rightarrow \text{energy eV} + 2\text{H}_2 + \text{O}_2$

### Problem Statement/Motivation

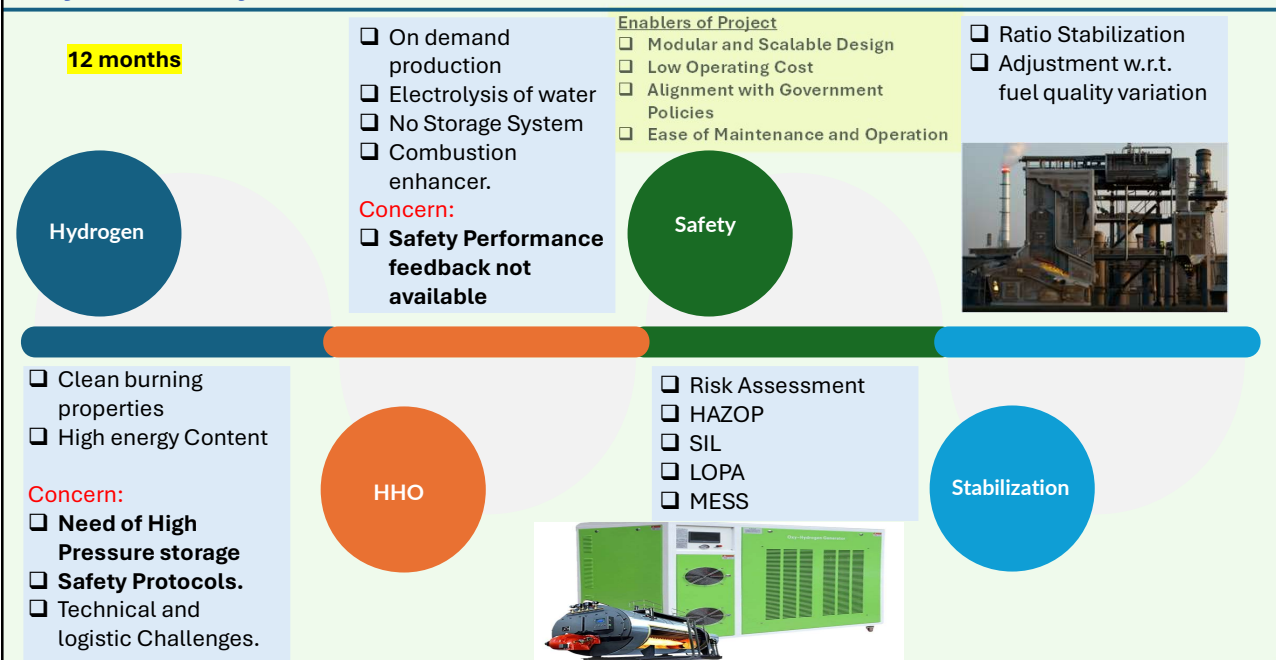
- ☐ Biomass-fired boilers suffer from **incomplete combustion**, leading to suboptimal fuel usage.
- ☐ **High Ash content**
- ☐ In the ongoing pursuit of energy efficiency and environmental sustainability, PepsiCo is continuously striving for more efficient technologies which can result in fuel reduction & emission improvement.

### Project Significance

- ☐ Advanced **combustion enhancement** techniques are being explored.
- ☐ Integration of HHO (Brown Gas) generators into existing boiler systems. HHO gas, composed of hydrogen and oxygen produced through water electrolysis, acts as a powerful combustion catalyst.
- ☐ Introducing into the combustion chamber promotes more complete oxidation of fuel, reducing unburnt particles and improving overall thermal efficiency.

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## Project Journey



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## Replication Potential

### Replication within the same sector

#### Widespread use in Biomass boiler

Extensively used in industries such as agro-processing, textiles, food & beverage, paper & pulp, and sugar mills.

#### Ease of Integration

The HHO generator is designed for simple retrofitting onto existing boiler systems, requiring minimal modifications. This allows seamless adoption.

#### Attractive Payback period

With an estimated 10% reduction in fuel consumption, the system offers a short payback period, making it a cost-effective and economically viable solution.

#### Support for Environmental compliance

The improved combustion efficiency leads to a reduction in PM and CO emissions, aiding industries in achieving compliance with pollution board.

### Implementation in other industrial Sector

#### Fossil Fuel Boilers (Coal, LDO, FO, PNG, etc.)

The technology can be adapted to improve combustion

#### Thermal Oil Heaters & Hot Air Generators

In sectors where precise thermal control is essential, HHO integration can enhance combustion efficiency without redesigning the system.

#### Kilns and Furnaces (Steel, Ceramics, Brick Industries)

High-temperature industrial processes that require consistent heat can benefit from improved combustion efficiency.

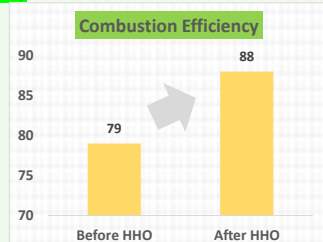
#### Diesel or Petrol Engines (Backup Generators, Vehicles)

Though not the core focus, HHO generators have been used in internal combustion engines to improve fuel economy.

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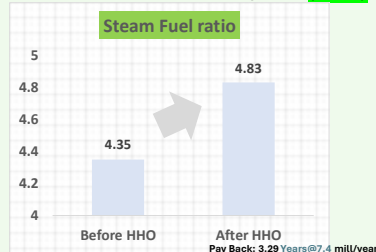
## Tangible Benefits

### Improved Combustion Efficiency (9%)

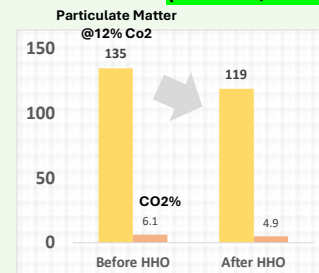


### Increase in Steam Fuel Ratio

Reduction in Fuel Consumption (10%)

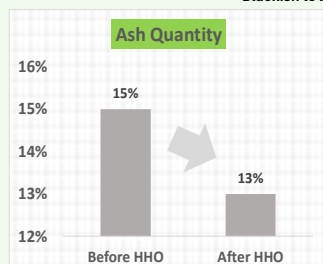


### Lower Emissions (12% PM, 19% CO2)



### Ash Reductions (2%)

Colour change from Blackish to brownish



### Regulatory Compliance & Environmental Certification Support

- ❑ Reduction in particulate matter and CO emissions, supporting compliance with Central and State Pollution Control Board standards.
- ❑ Supports ongoing efforts toward **ISO 14001:2015 certification**, (Pollution prevention and continual environmental improvement)

### Contribution to Sustainability Goals

- ❑ Contribution to India's Nationally Determined Contributions (NDCs): Reduced emissions and improved combustion efficiency, the project contributes to India's **climate commitments under the Paris Agreement**, supporting **low-carbon and sustainable industrial growth**.

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## Intangible Benefits

|                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Enhanced Environmental Responsibility &amp; Corporate Image</b>  <ul style="list-style-type: none"> <li>❑ Showcases a proactive approach to reducing carbon emissions and particulate pollution, directly contributing to cleaner air and climate action.</li> <li>❑ Supports national sustainability drive</li> </ul>           | <b>Innovation Culture and Technological Leadership</b>  <ul style="list-style-type: none"> <li>❑ First-of-its-kind application in biomass boilers sets the organization apart as an early mover in industrial clean tech innovation.</li> </ul>       | <b>Increased Stakeholder Confidence</b>  <ul style="list-style-type: none"> <li>❑ Demonstrates proactive efforts towards compliance and sustainability, strengthening trust with regulators and investors.</li> </ul> |
| <b>Future Readiness &amp; Strategic Positioning</b>  <ul style="list-style-type: none"> <li>❑ Anticipates stricter environmental norms by investing in low-emission, high-efficiency combustion solutions.</li> <li>❑ The modular design allows to be scaled across facilities and fuel types (biomass, coal, FO, etc.).</li> </ul> | <b>Community &amp; Industry Recognition</b>  <ul style="list-style-type: none"> <li>❑ Lower local air pollution due to reduced emissions fosters goodwill in surrounding communities and enhances the company's social license to operate.</li> </ul> | <b>Support for ESG Goals</b>  <ul style="list-style-type: none"> <li>❑ Aligns with global ESG (Environmental, Social, Governance) goals, appealing to environmentally-conscious clients and partners.</li> </ul>      |

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## Uniqueness of the Project



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# Thank You

Driving Sustainability Through  
Innovation

