

Creating Energy Through Hydrogen

Presenter : Dr. Jagjit Singh
CEO, CST EnviroTech

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01

Overview

Overview

On-demand hydrogen production eliminates storage risks, promoting safe and efficient energy generation for varied applications.

The process is eco-friendly, utilizing clean energy sources to create hydrogen without relying on fossil fuels, thereby reducing carbon footprints.

Versatile energy solutions include steam, hot water, cooling, and oxygen generation, catering to diverse industrial needs.

Scalable technology adapts to industries of all sizes, ensuring its feasibility across small, medium, and large-scale operations.



02

Core Technology



Core Technology

Generation of hydrogen from water: Utilizes renewable energy or grid electricity to extract hydrogen from water, ensuring a sustainable and eco-friendly energy solution.

Direct application for heating and cooling: Enables efficient use of hydrogen in heating and cooling processes, providing energy versatility without reliance on conventional fossil fuels.

Oxygen as a valuable byproduct: Produces oxygen during hydrogen generation, which can be repurposed for industrial or health-related applications.

Zero CO₂ emissions: Completely eliminates carbon dioxide emissions by avoiding fossil fuel combustion, contributing to a cleaner and greener environment.



03

Using Thermal Energy *for* Food & Beverage Industry Applications

Tea Estates



- **ECO- Friendly drying and processing**

Hydrogen-generated steam ensures sustainable and efficient drying processes that reduce environmental impacts.

- **Improved product quality**

Utilizing hydrogen energy helps maintain optimal processing conditions, preserving the aroma and flavor of tea leaves.

- **Renewable energy integration**

Direct use of renewable electricity to produce hydrogen aligns tea production with sustainable energy practices.

Milk Plants



Hot Water & Steam for cleaning.

Hydrogen-powered systems provide consistent and hygienic cleaning solutions for equipment and surfaces.

Pasteurization Processes.

On-demand hydrogen production ensures precise temperature control for milk pasteurization, enhancing safety and quality.

Steam for Spray Driers.

Transitioning to hydrogen energy cuts dependency on fossil fuels, minimizing both operational costs and carbon footprint.

Rice Industry



Steam for parboiling

Hydrogen-based steam systems enable efficient parboiling processes for rice, improving production throughput.

Sustainability in processing

Using hydrogen ensures eco-friendly operations free from CO₂ emissions, contributing to greener industrial practices.



Enhanced post-processing quality

Optimum heat control with hydrogen energy minimizes operational disruptions and enhances overall rice quality.

Community Kitchens



Cooking without LPG

Hydrogen energy provides a clean and sustainable alternative to traditional LPG for large-scale cooking operations.



Simplified operations

On-demand hydrogen eliminates storage risks commonly associated with LPG or other fuel sources.



Carbon-neutral meals

Embracing hydrogen energy ensures zero emissions during cooking, advancing environmental goals.

Baking & Frying

01



Consistent heat supply

Hydrogen-powered systems deliver reliable and uniform heat, optimizing baking and frying operations.

02



Energy savings

Scalable systems minimize energy waste by utilizing hydrogen efficiently, reducing operational costs for bakers.

03



Cleaner production

The absence of fossil fuels in hydrogen energy results in a healthier working environment devoid of harmful emissions.



04

Manufacturing & Industrial Applications



Process Heating Solutions



Role in process heating

Hydrogen is utilized for industries like ceramics, textiles, and paper that require high-temperature operations.



Cost efficiency

Reduces operational costs by replacing traditional energy sources with hydrogen-based solutions.



Carbon neutrality

Ensures zero carbon emissions during heating processes, aligning with global environmental goals.

Versatility Across Sectors



- **Powder and ceramic coating**

Enables precise and efficient heating required for coating applications.

- **Polymer processing**

Supports injection and blow moulding operations with hydrogen-fueled heat.

- **Chemical manufacturing**

Provides steam or hot water essential for chemical reaction processes.

Environmental Benefits



Eliminating fossil fuels

Replaces conventional methods that rely on carbon-heavy energy sources like coal or oil.

Reduced CO₂ footprint

Helps industries shrink their overall carbon emissions for better compliance with environmental standards.

Safer energy sourcing

Hydrogen production on-demand minimizes risks associated with fuel storage and transport.



05

Cooling & Comfort Applications

Cold Storage Solutions



Hydrogen-powered cold storage systems ensure precise temperature control for perishable goods, enhancing product longevity and reducing spoilage rates.

These eco-friendly systems eliminate the need for fossil fuels, minimizing environmental impact while maintaining high efficiency.

Advanced cooling technology allows seamless operations even in off-grid or remote locations, providing reliable cooling solutions globally.

Air Conditioning Applications



01

Hydrogen-based chilled water systems deliver efficient cooling for hotels, offices, and data centers, fostering comfortable environments with zero carbon emissions.

02

Scalable and adaptable designs cater to spaces of varied sizes, ensuring optimal air conditioning performance and energy savings.

03

The technology supports resilient cooling infrastructures, improving indoor air quality and reducing dependency on traditional energy sources.



Healthcare Facility Comfort



Hospitals benefit from hydrogen-driven cooling and heating systems by maintaining critical environmental parameters for patient care and medical equipment functionality.



On-demand hydrogen ensures uninterrupted operation, reducing risks associated with conventional fuels and centralized energy sources.



Systems are designed to cater to specific facility needs, including chilled water for cooling and comfort heating in recovery areas.

Recreational Heating Applications



Swimming pools and steam baths utilize hydrogen-powered heat technology, offering consistent temperature control for enhanced user experience.



Eco-friendly solutions reduce operational costs, ensuring sustainable energy practices in large recreational spaces.



These systems integrate seamlessly with existing setups, delivering tailored solutions for hospitality and wellness industries.

Data-Center Solutions

01

Hydrogen-based cooling systems are ideal for maintaining the thermal efficiency of critical IT infrastructures in data centers.



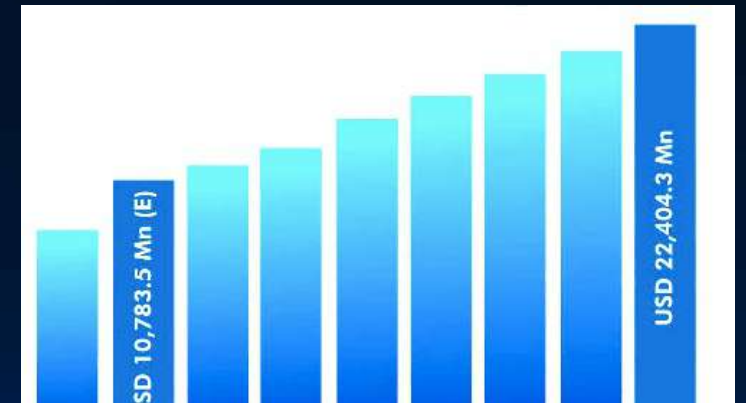
02

Low-carbon cooling solutions mitigate environmental impact while ensuring the safety and reliability of sensitive hardware.



03

With scalable configurations, hydrogen-driven systems adapt to growing data demands without compromising on performance efficiency.



06

Special Applications

Fresh Oxygen Production



Health benefits for medical facilities

Produces pure oxygen that is suitable for hospitals and other health-related industries to ensure better patient outcomes.

Industrial uses

Supplies oxygen for chemical reactions, welding, and other processes that require highly purified oxygen.

Sustainability focus

Offers an eco-friendly alternative to traditional oxygen generation methods by utilizing water-derived hydrogen.



Vertical Farming



Improved energy efficiency

Provides sustainable heating and cooling for controlled agricultural environments, promoting energy savings in vertical farming setups.

Enhanced crop growth

Ensures the availability of oxygen and hydration within enclosed farming spaces to maximize crop yield.

Reduced dependence on external resources

Utilizes self-contained resources to minimize reliance on external energy and water supplies.

Drinking Water



Off-grid water supply solutions

Captures and condenses water in remote areas where traditional sources are unavailable, providing hydration for human and agricultural needs.

Sea Water – Distillation

Functions effectively in arid or high-altitude environments, addressing unique geographic challenges.



Energy-efficient operation

Leverages hydrogen production processes to perform water condensation without increased energy demands.

Ideal for Off-Grid or Remote Locations



- **Sustainable energy independence**

Provides reliable heating, cooling, and water production without dependence on conventional fuel or energy grids.

- **Portable system design**

Enables flexible setups across remote locations, allowing operations in challenging terrains or disaster-hit areas.

- **Eco-friendly**

Incorporates renewable electricity sources, ensuring environmental conservation while supporting remote communities.



07

Benefits Summary

Benefits Summary

Energy savings with high efficiency

Hydrogen energy systems offer unparalleled efficiency by generating energy directly from water and electricity, minimizing waste and maximizing output for industrial and commercial applications.

Zero CO₂ emissions – environmental friendliness

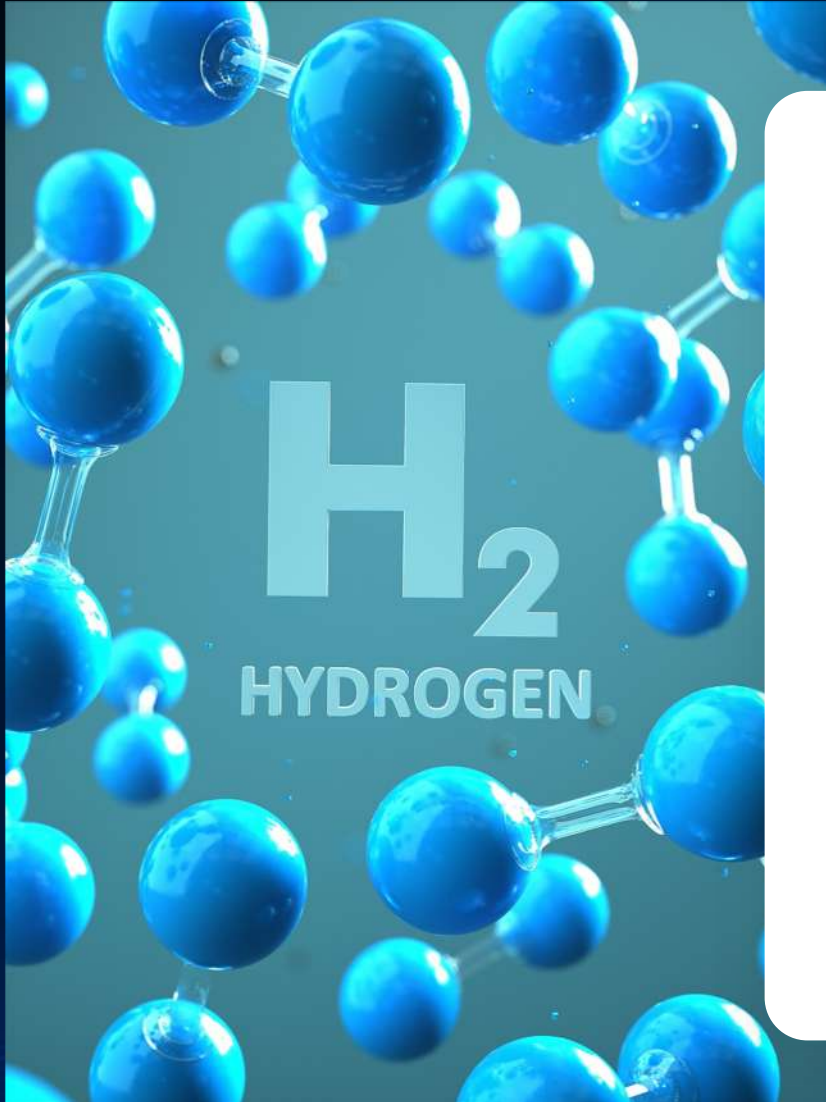
Unlike fossil fuels, hydrogen energy produces no carbon dioxide, contributing significantly to a reduction in greenhouse gas emissions and fostering a sustainable future.

Safer operations through on-demand production

Eliminating the need for storage, hydrogen energy is generated as needed, reducing risks associated with storage and transportation of hazardous chemicals.



Benefits Summary



Applicability to multiple industries

Positive return on investment (ROI)

Thank you

