



Interstate Waste Technologies

About IWT



ABOUT IWT

IWT is a development company that privately finances, designs, constructs, and operates waste processing facilities. IWT uses Thermoselect technology, a patented process, incorporating high-temperature gasification to recycle municipal waste into clean energy and useful products.

IWT maintains offices in Middleburg, Virginia; and West Chester, Pennsylvania.

IWT contracts with a major design/build team for each project. The design/build team provides a 100% payment and performance bond and guarantee of the price, schedule, and performance of the facility.

IWT contracts with a major operations and maintenance contractor for each project. The O&M contractor provides necessary bonds and guarantees in support of their work.

Contractors currently working with IWT include AECOM, NAES, and RTP Environmental Services.

IWT PARTNER COMPANIES

AECOM

13.1 billion of revenue during fiscal year 2022

Ranked #1 in transportation design, facilities design, green design and environmental engineering by Engineering News-Record in 2022

Named one of Fortune magazine's "World's Most Admired Companies" for the eighth consecutive year."

Listed at #260 on the Fortune 500 as one of America's largest companies



NAES

NAES is the power generation industry's largest independent services provider, dedicated to optimizing the performance of energy facilities worldwide and responsible for managing more than 50,000 MW of generation. The NAES family of companies, comprising 4,000+ team members, provides an unparalleled wealth of experience in operations, maintenance, fabrication, grid management, regulatory compliance, and technical support to build, operate and maintain both traditional and renewable resources.



RTP ENVIRONMENTAL

RTP is at the forefront of waste management from environmental and regulatory perspectives.

A large portion of their efforts are currently directed at the solid waste management area.

The experts at RTP are involved in a number of projects involving waste issues



**RTP Environmental
Associates, Inc.**

Proven Technology



Over 25 Years of processing millions of tonnes of waste on a commercial scale

AECOM (URS), One of the nation's largest engineering firm prepared reports, using two separate evaluation teams and concluded the following

“Based on supplier credibility, existing operations experience, completeness of engineering, landfill diversion, permit ability and economics, IWT and the Thermoselect technology were ranked #1 worldwide.”

Projects in Japan

PROVEN TECHNOLOGIES AT COMMERCIAL SCALE

(Thermoselect) Gasification

**Technology Application -
Convert synthesis gas
produced from MSW into clean
energy**

- 43 patented processes – over 300 patent awards worldwide
- 30 years of operating experience
- Has reliably processed millions of tons of waste
- 7 plants operating in Japan processing MSW since 1999



THERMOSELECT Plants in Japan

	Chiba	Mutsu	Nagasaki	Kurashiki	Yorii	Tokushima	Osaka
Waste Type	Industrial	MSW	MSW	Industrial	Industrial	MSW	Industrial
Syngas use	Export	Gasengine	Gasengine	Export	Boiler	Gasengine	Boiler
Capacity tpd	300	140	300	555	400	120	95
Number of lines	2	2	3	3	2	2	1

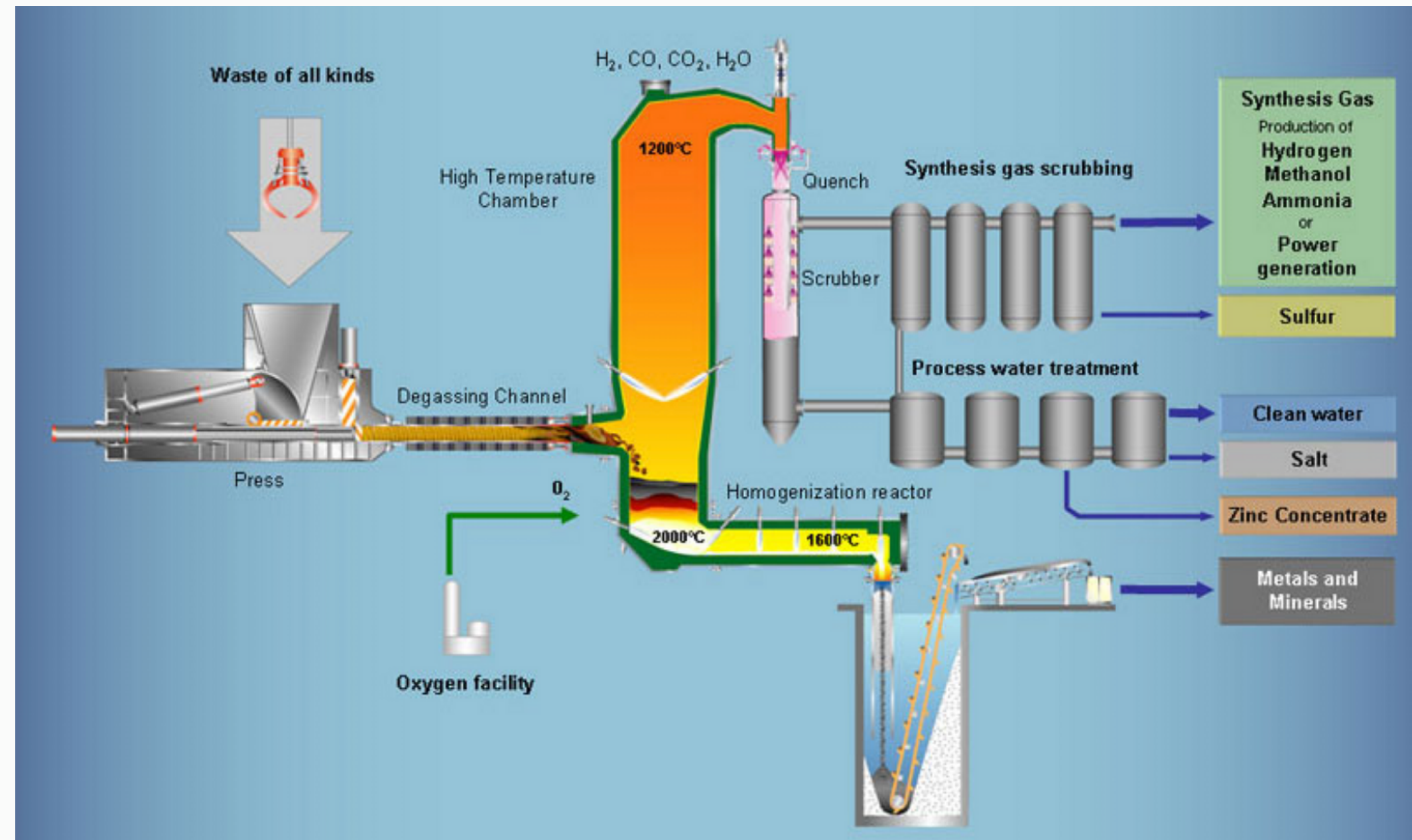
The different configurations of the Japanese plants demonstrate the various possibilities and flexibility of the Thermoselect technology

The Solution

TECHNOLOGY

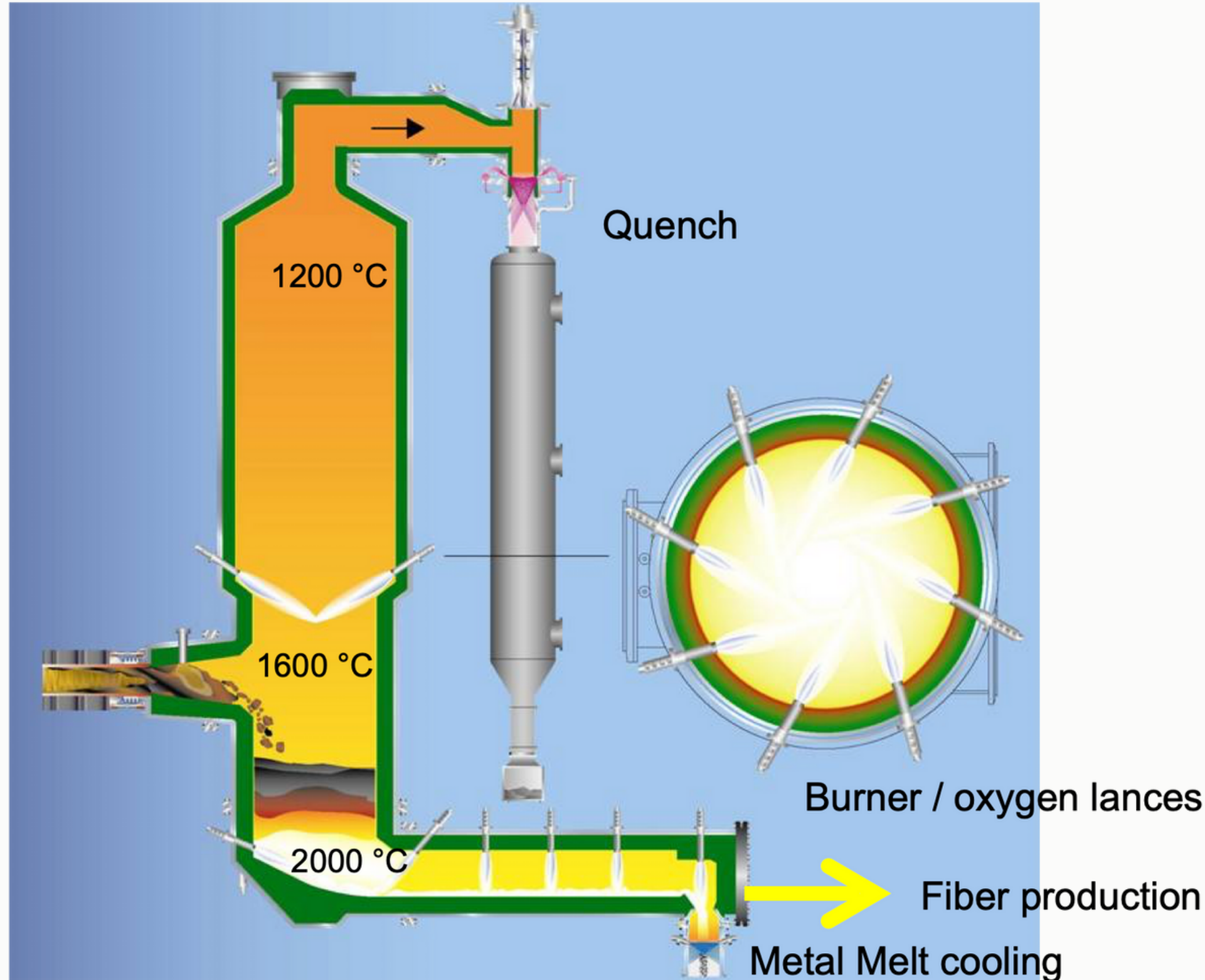
IWT has identified a proven process that transforms municipal solid waste into usable raw materials, with no toxic emissions.

The Thermoselect process utilizes gasification to recycle 100% of waste into an energy rich syngas that can be used to generate Green Hydrogen.

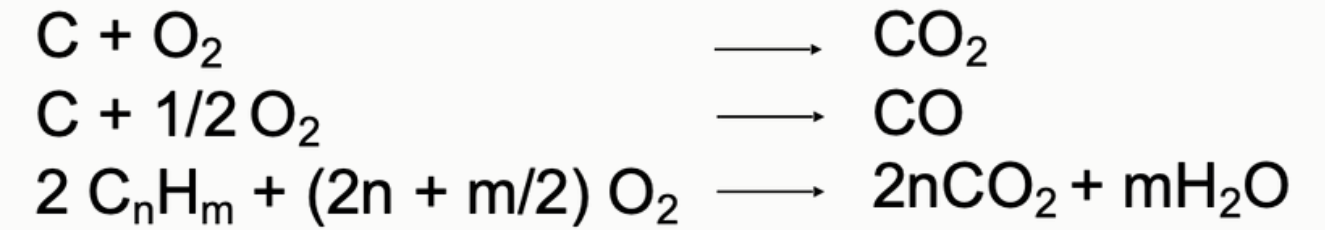


Thermoselect is environmentally friendly and effectively disposes of waste, diverting it 100% from landfills.

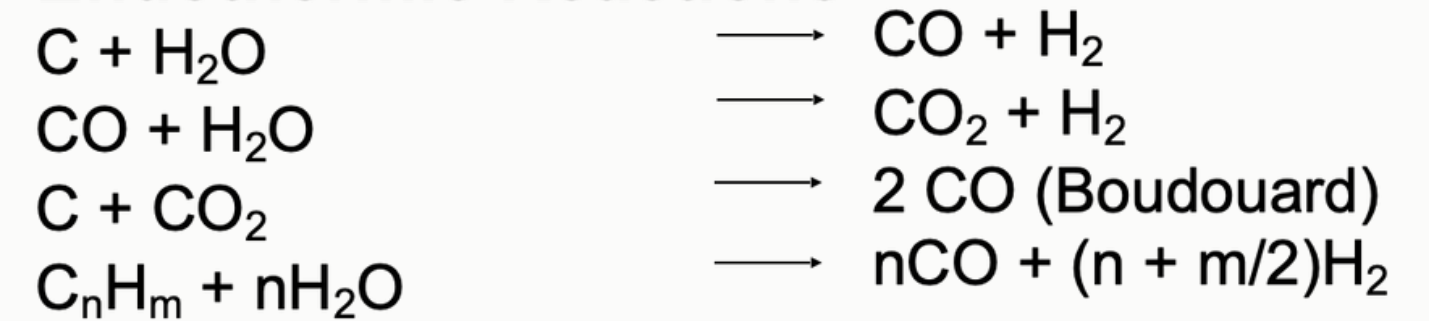
Thermal treatment: Gasifier



Exothermic Reactions



Endothermic Reactions

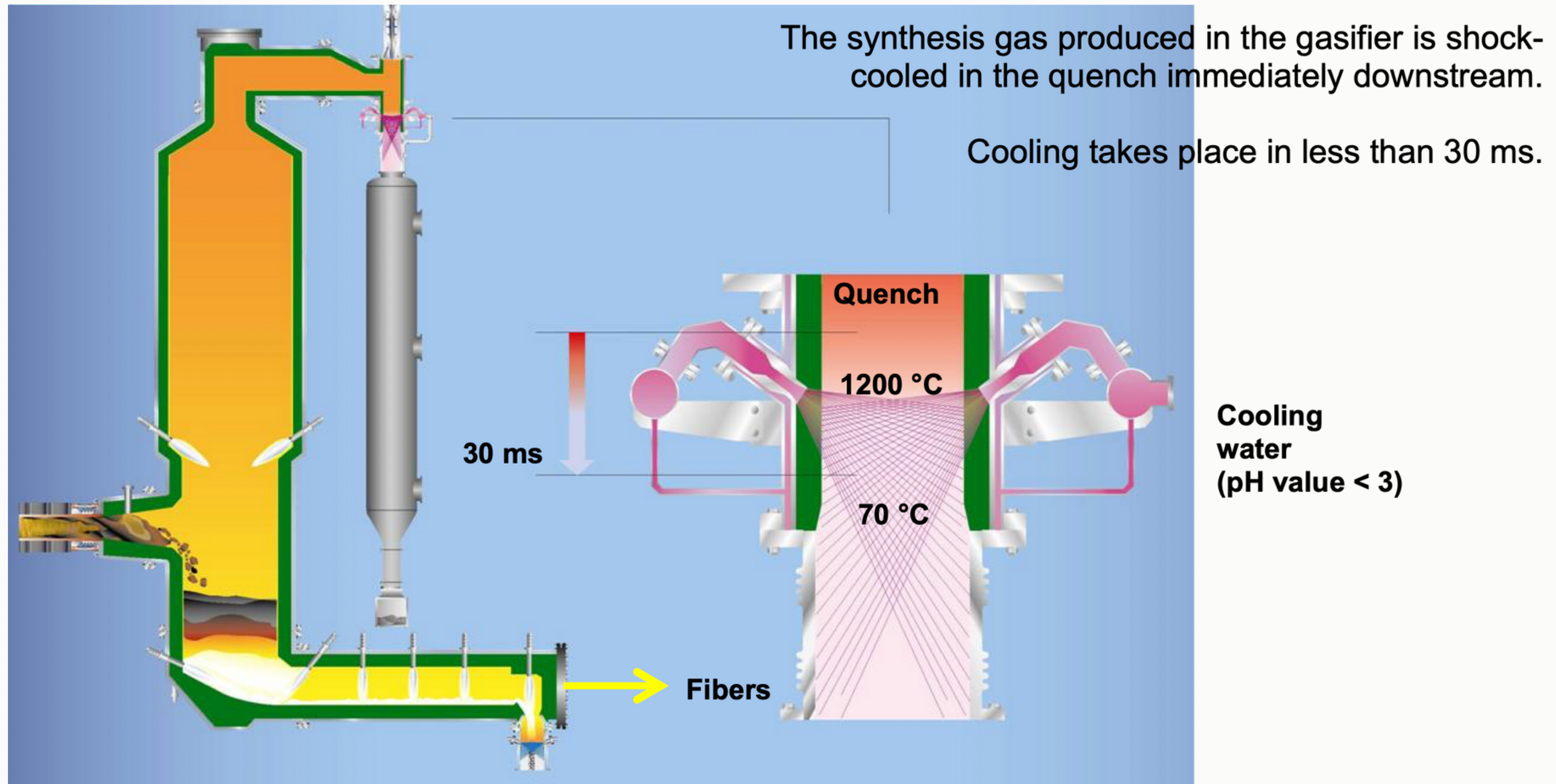


The produced synthesis gas is primarily composed of H_2 , CO , CO_2

Metal and mineral constituents are molten

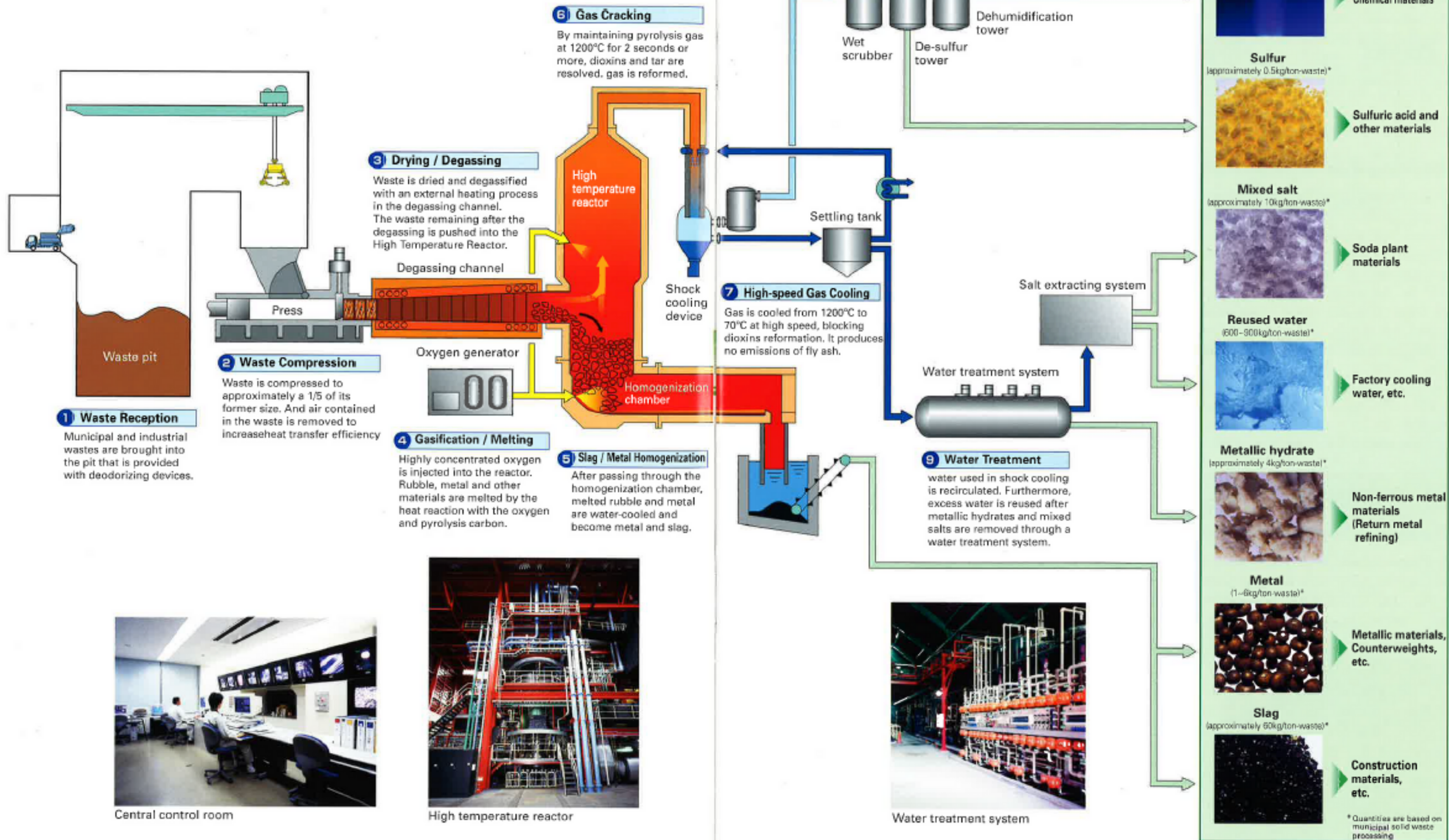
Controlled injection of oxygen is used to gasify organic components at temperatures up to 2000°C.

Synthesis gas shock cooling



The design of the direct quench is a unique feature of the TS process and is absolutely necessary for chemical downstream utilization of syngas

Link the earth's natural processes, converting waste into energy and new resources.

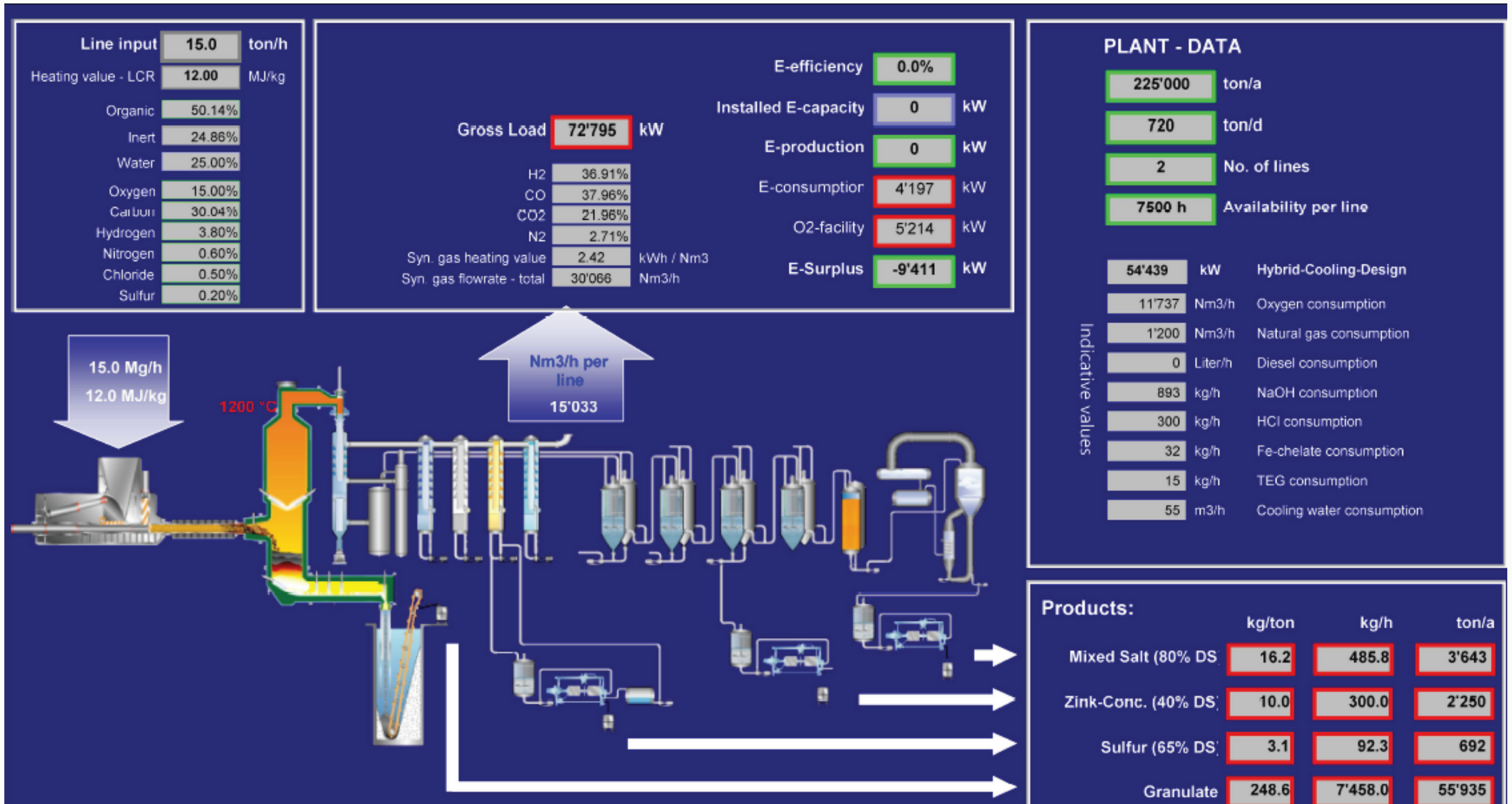


PRODUCES 100% RECYCLED MATERIAL
100% Diversion Rate From Landfills
 Example

<u>Input</u>	<u>Pounds</u>		<u>Products</u>	<u>Pounds</u>
Waste (1 ton)	2,000		Synthesis Gas	1,800
Oxygen	1,000		Recycled Water	710
Consumables	130		Aggregate	500
NaOH			Metal Pellets	70
HCL			Sulfur	20
Ion Exchange Resin			Salt	17
Hydrogen Peroxide			Zinc Concentrate	13
Iron Chelate				
Total	3,130		Total	3,130

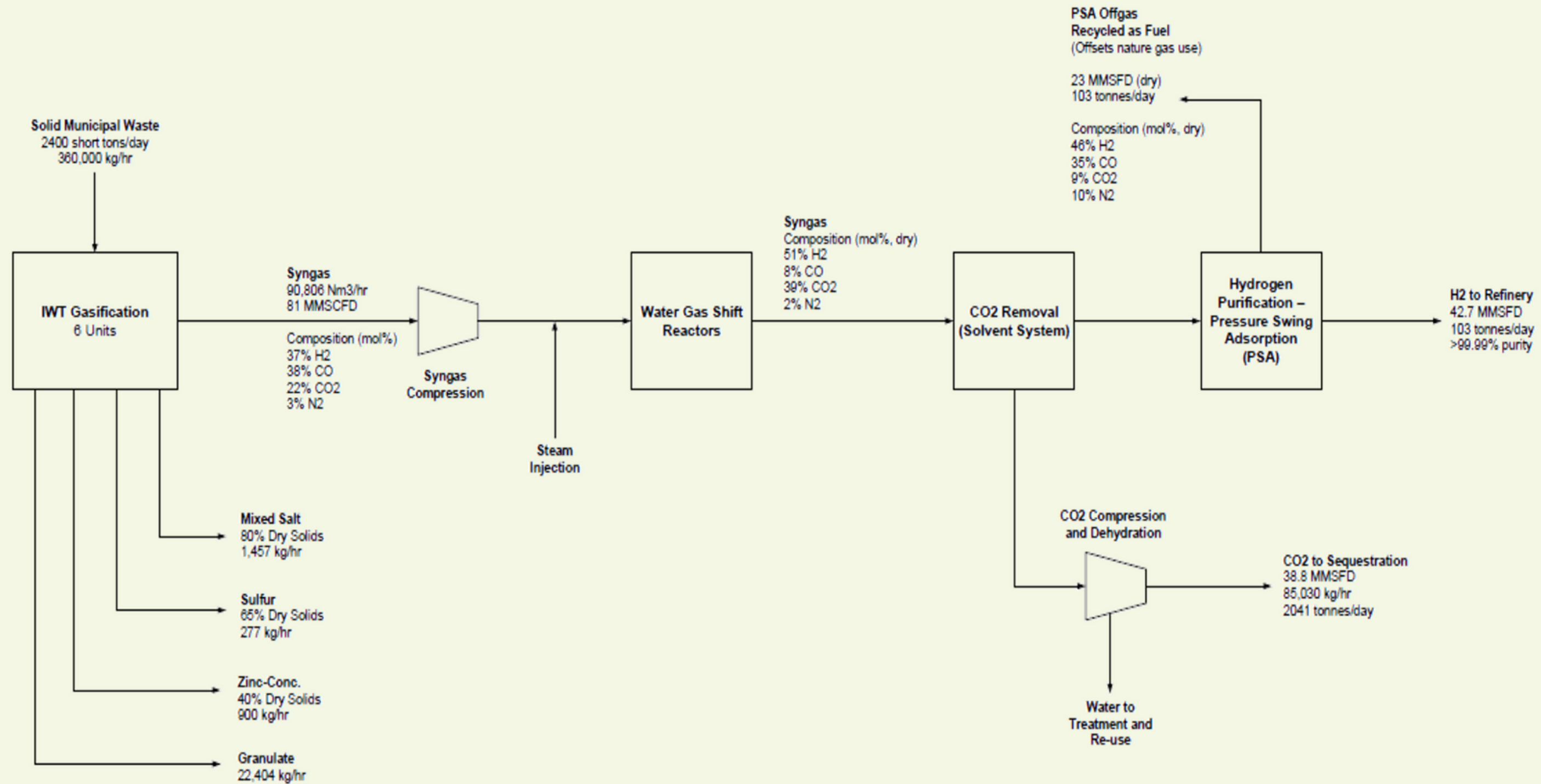
Plant Balance 2 lines waste – to – syngas

Example



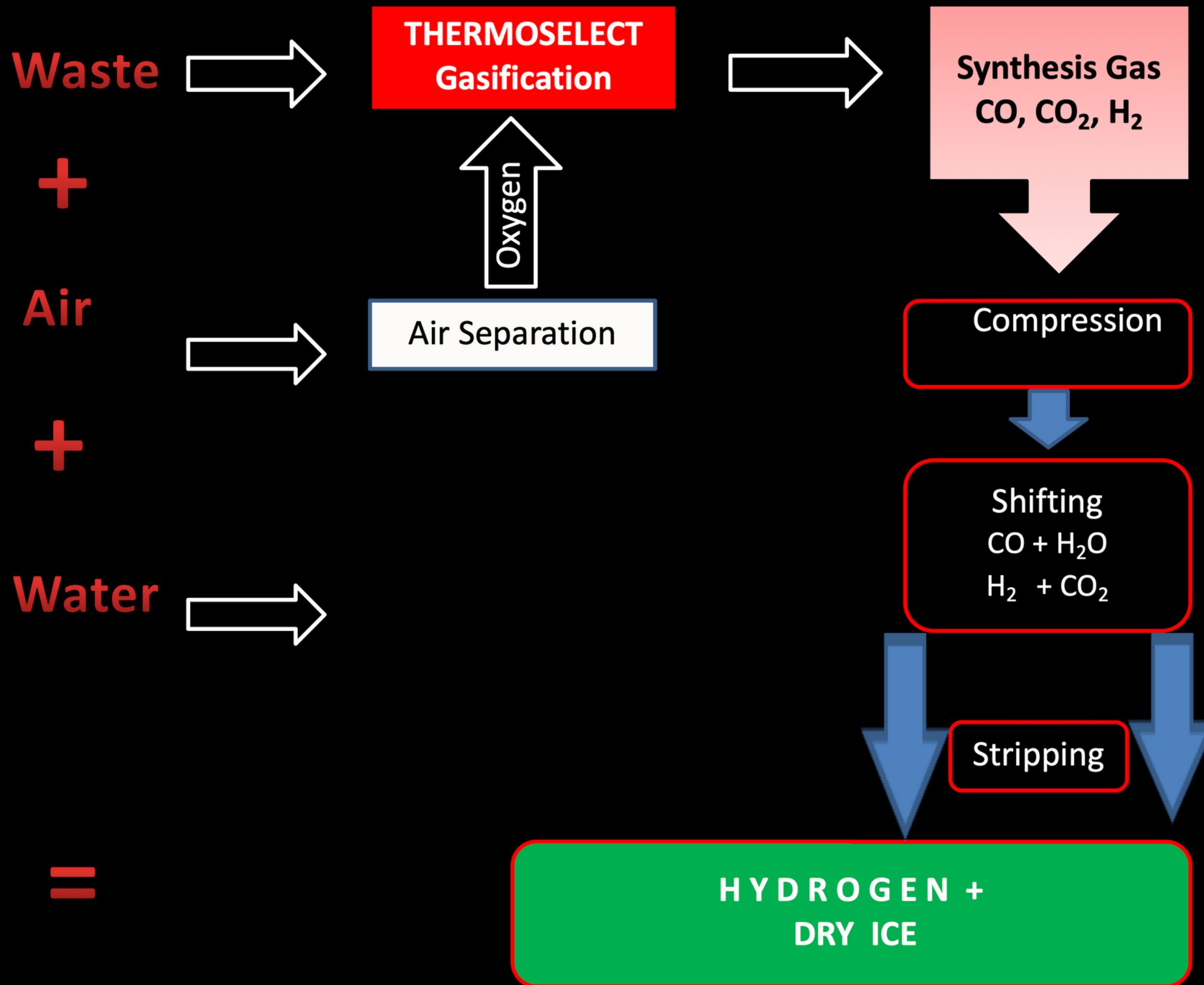
IWT/Sinergia Syngas to hydrogen

Example



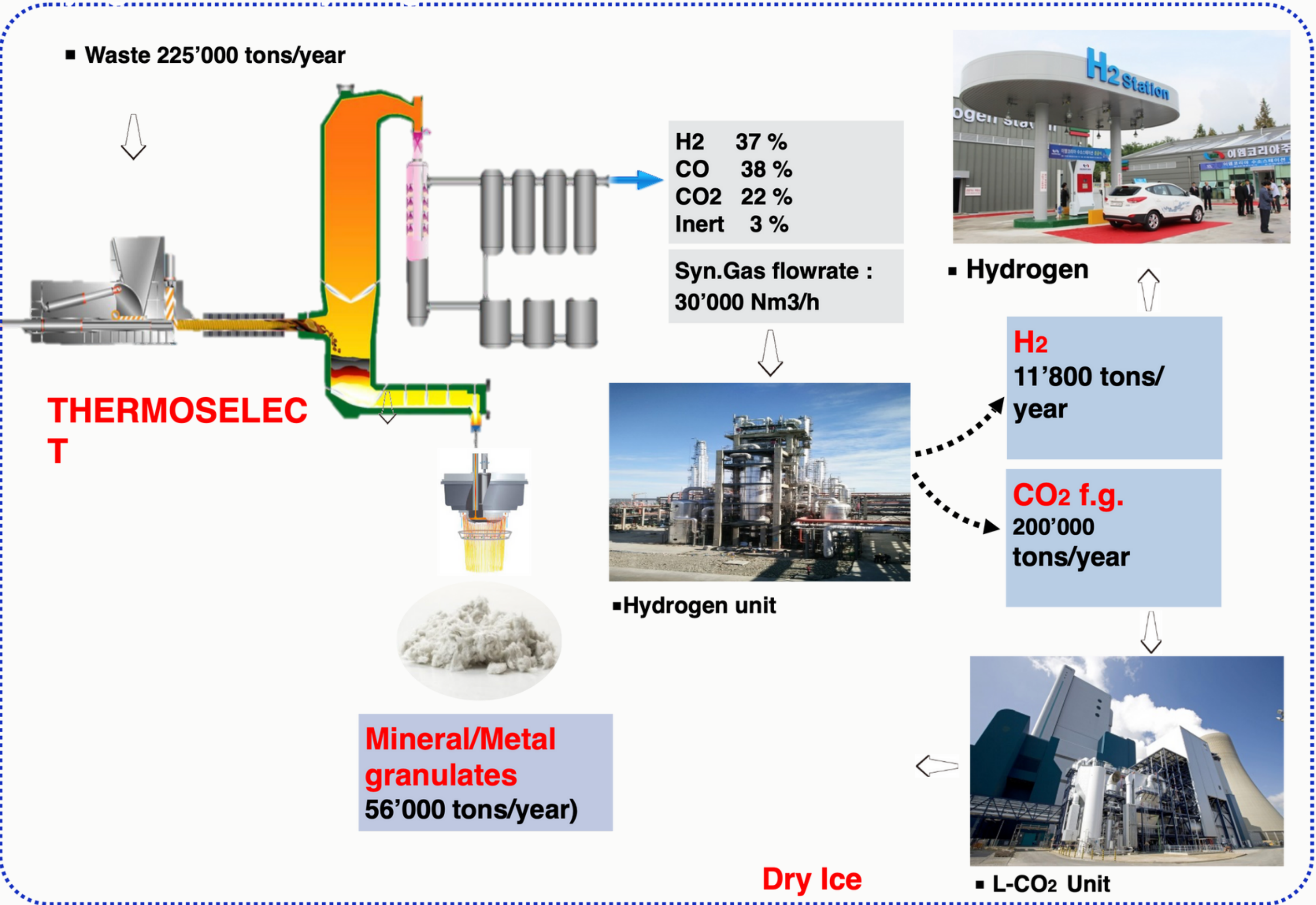
Commercially Demonstrated Options for CO₂ Removal and H₂ Recovery:

1. Solvent System + PSA (shown in drawing)
2. Vacuum Swing Adsorption + PSA
3. Cryogenic Separation + Membranes
4. Cryogenic Separation + Solvent System



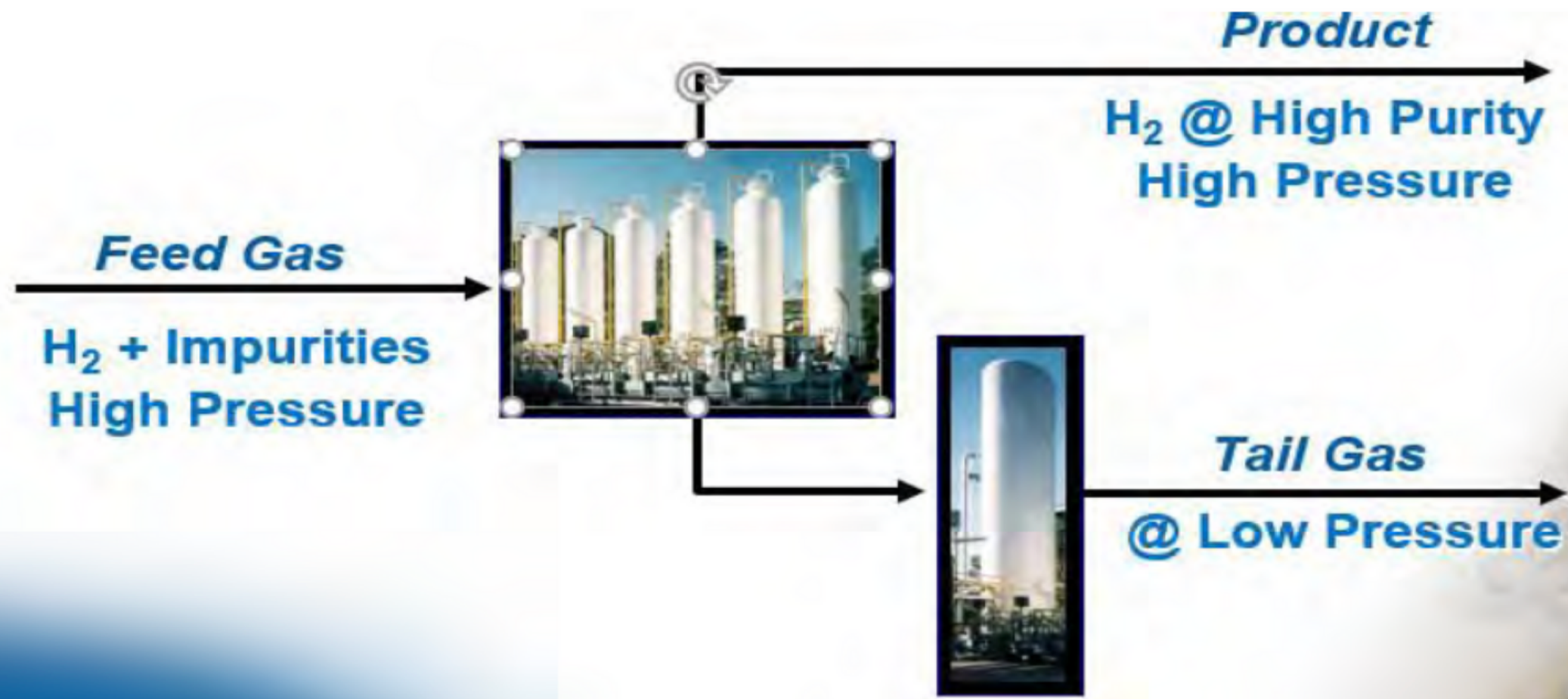
Syngas – to – Hydrogen

VIVERA



HONEYWELL H₂ PURIFICATION

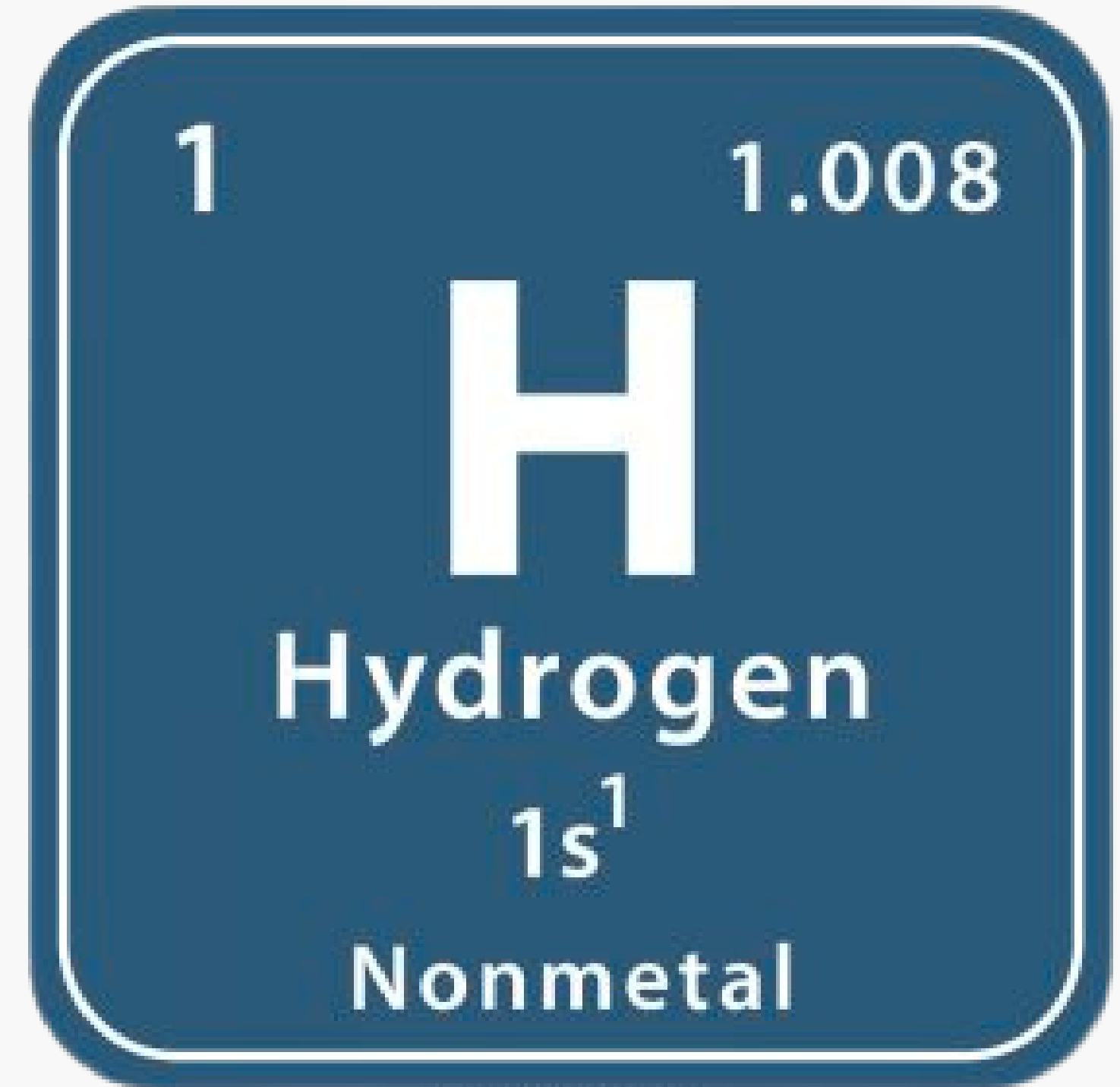
H₂ PURIFICATION – POLYBED™ PSA SYSTEMS



Two Line H₂ Production

H₂ Yield is 39.6 Kg Per Ton of MSW

- 26,659.669 Kg of Hydrogen Per Day
- 9,730,779.18 Kg of Hydrogen Per Year
- At \$5 Per Kg of H₂
- \$48,653,896 Per Year



Two Line MSW Plant

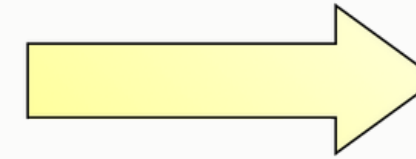
At 85% Throughput Capacity of MSW

- **673.2 Tons of MSW Per Day**
- **245,718 Tons Per Year**
- **At \$70 Per Ton of MSW**
- **\$17,200,260 Per Year**



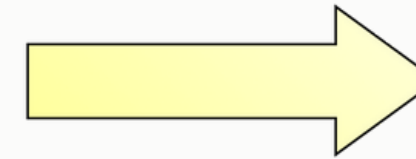
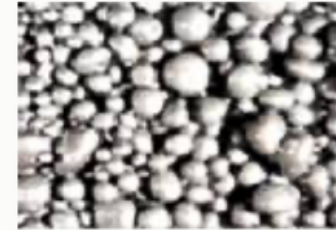
Diversion from landfill

Inorganic Melt
20 - 25 % of Input



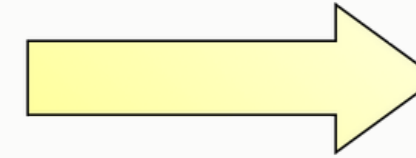
Mineral Wool
Concrete
Sand-Blasting

Metal Melt (Iron-Copper Alloy)
1- 5 % of Input



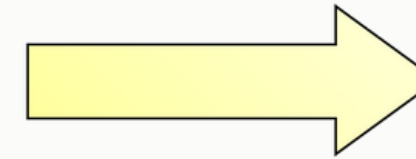
Metallurgy

Salt
approx. 1 % of Input



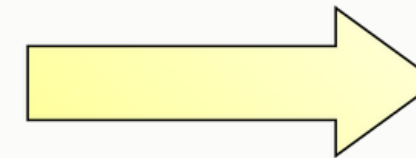
Chemical Industry, Additive for Metallurgy

Sulfur
approx. 0.2 - 0.3 % of Input



Chemical Industry,
i.e. Sulfuric Acid Production

Zinc-Concentrate
approx. 0.2 - 0.3 % of Input



Zinc-Recovery

All solid products from Thermoselect process can be converted into useful or high-value products like mineral wool

Recycled Products

- Aggregate - 61,429 Tons Per Year @ \$ 10/T= \$614,295
- Iron-Copper Alloy - 8,600 Tons Per Year @ \$.05/lb= \$860,000
- Sulfur - 2,457 Tons Per Year @ \$ 185/T=\$454,578
- Salt - 2,088 Tons Per Year @ \$88.50/T=\$184,841
- Zinc - 1,597 Tons Per Year @ \$ 20/T = \$31,940
- Total - 76,172 Tons Per Year \$ 2,145,654



IWT / MSW / H2

Summary

MSW	245,718 tons \$17,200,260
H2	9,730,779 Kg per year \$48,653,896
Recycled Products	76,172 T/Y \$ 2,145,654
Total Revenue	\$67,999,810

