



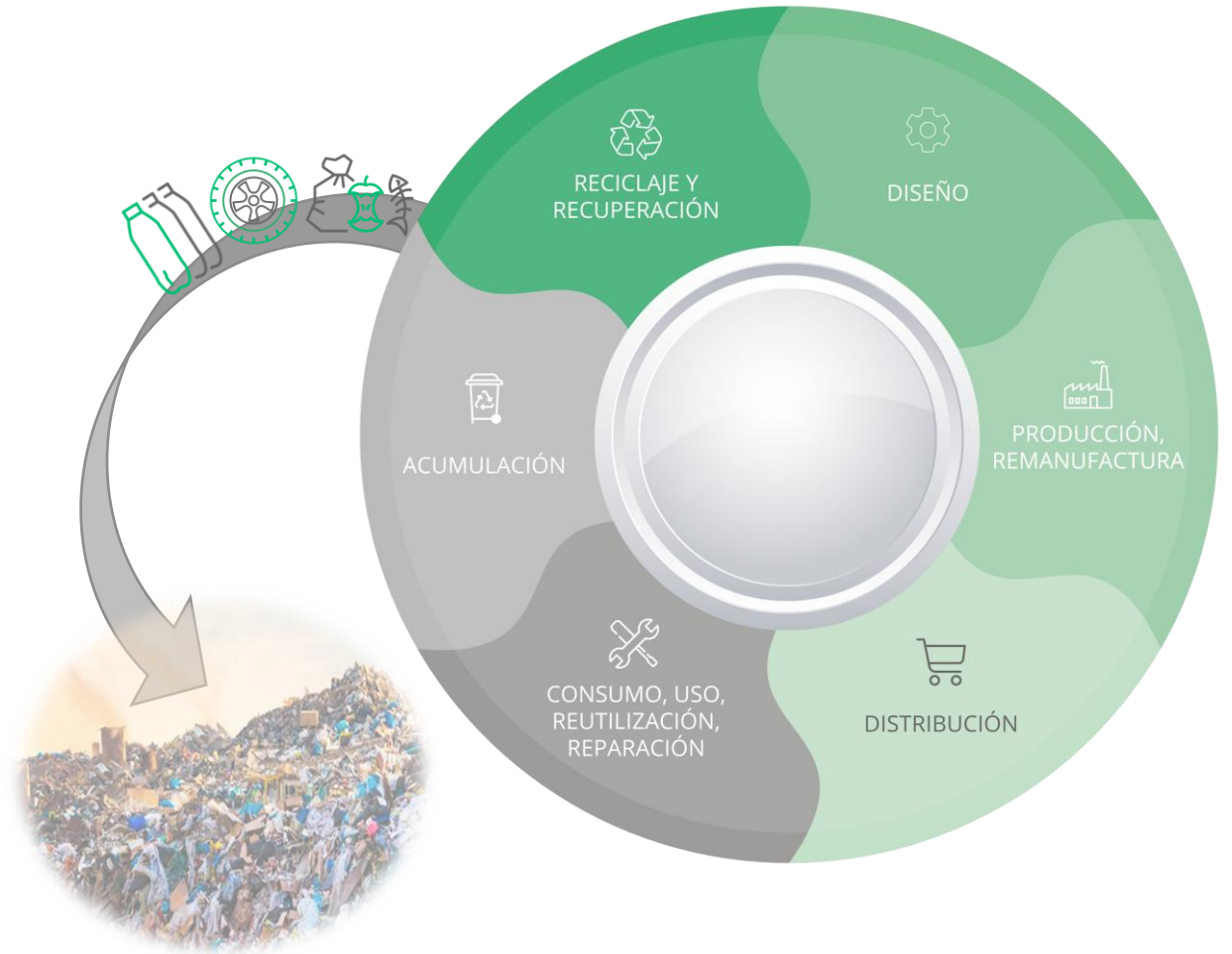
SBS

Thermal Technologies

CIRCULAR ECONOMY:

A good approach,
but insufficient

Thousands of tons of waste
continue to end up in
dump



NEW TECHNOLOGIES ARE NEEDED THAT ALLOW NEW EFFICIENT
VALORIZATION PROCESSES

HECO TECHNOLOGY

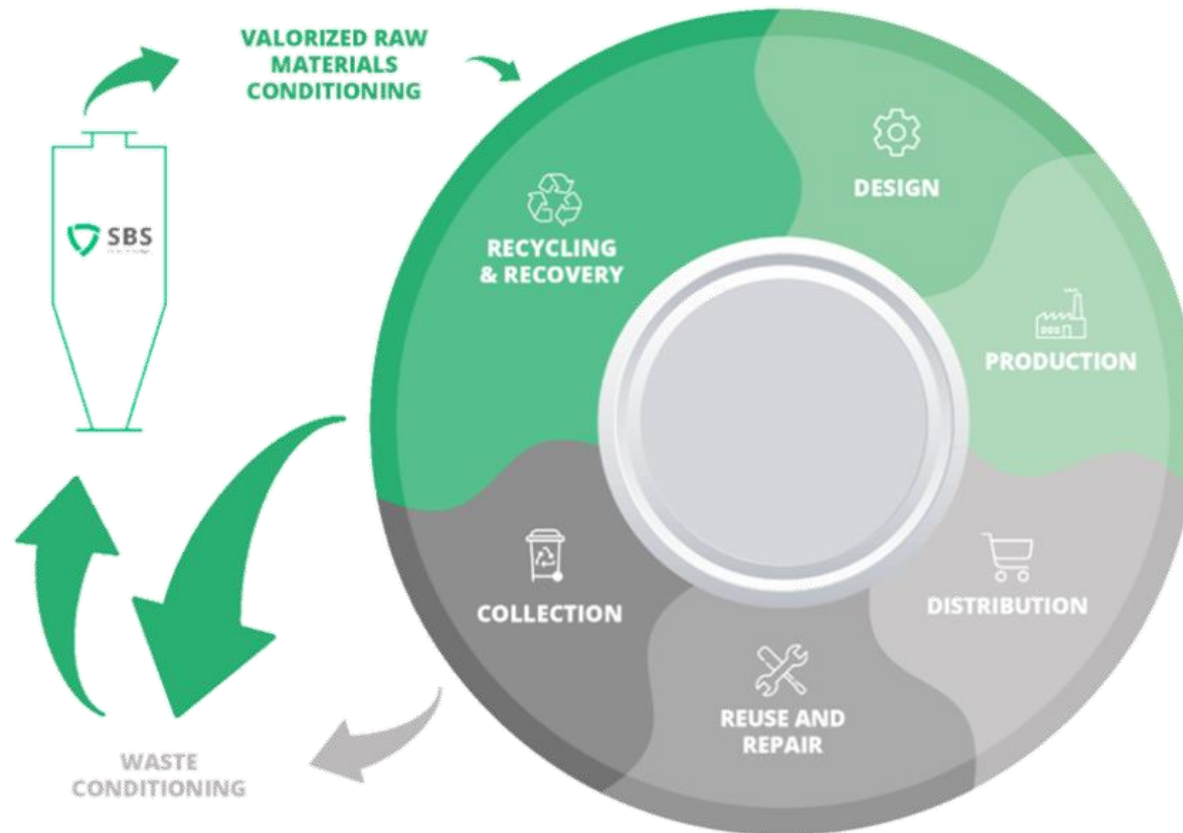
High Efficiency
Contact



HECO TECHNOLOGY



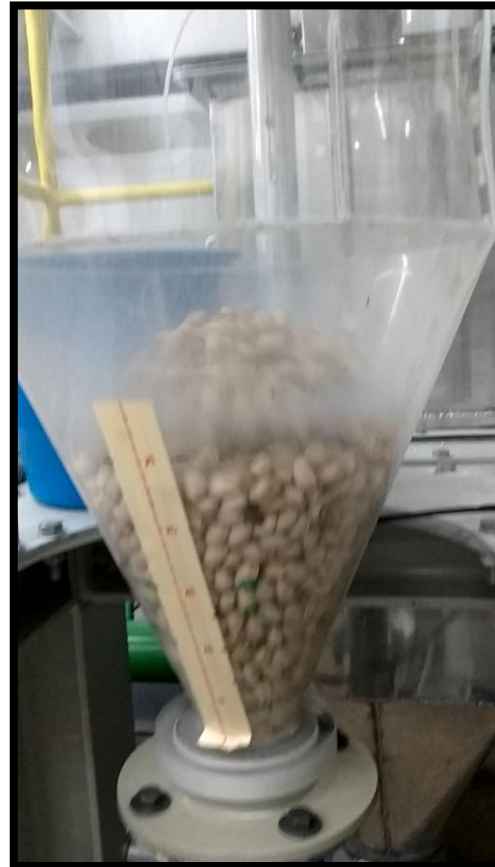
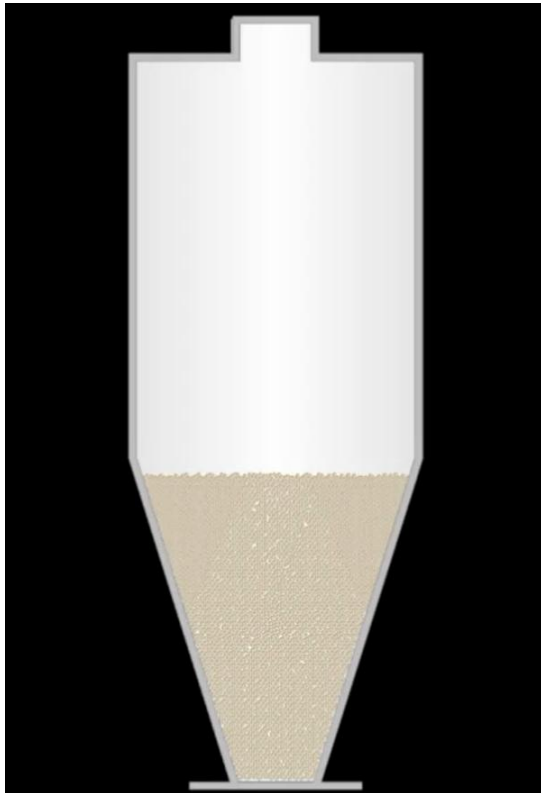
Aim: Processing of non-recyclable waste.



HECO TECHNOLOGY



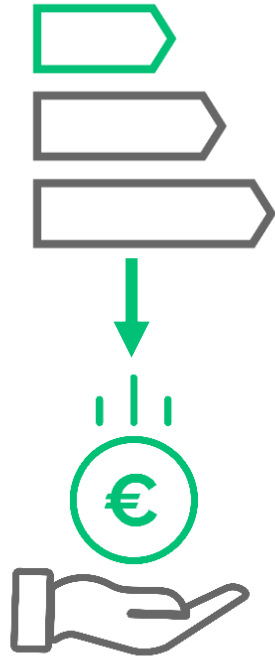
Based on **Spouted Bed** technology.



HECO TECHNOLOGY:

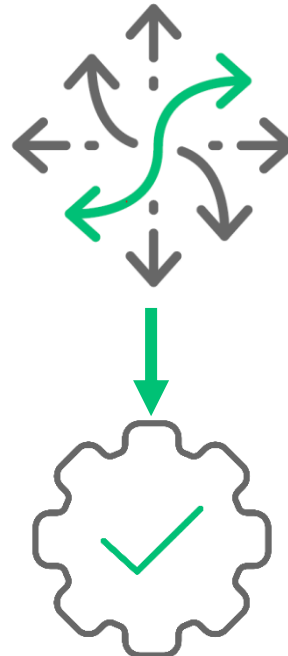
A differentiating technology

HIGH EFFICIENCY



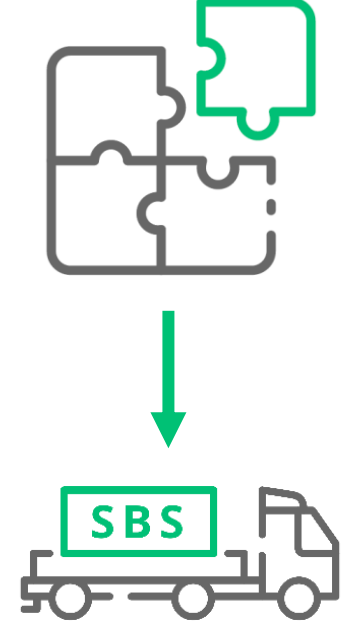
Savings in resources and maintenance costs and reduced payback

VERSATILITY



Management of complex materials with high performance and high quality end products

SIMPLICITY



Modular, compact design and easy maintenance. (no moving parts)

BUSINESS MODEL

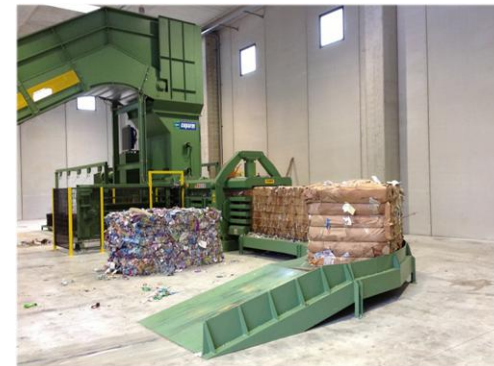
01 PRODUCTS

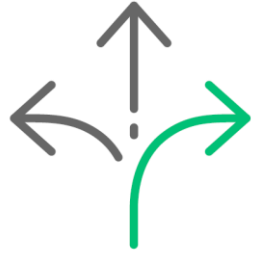
- 01 Treatment Plant sale
- 02 Technology Demonstration Service



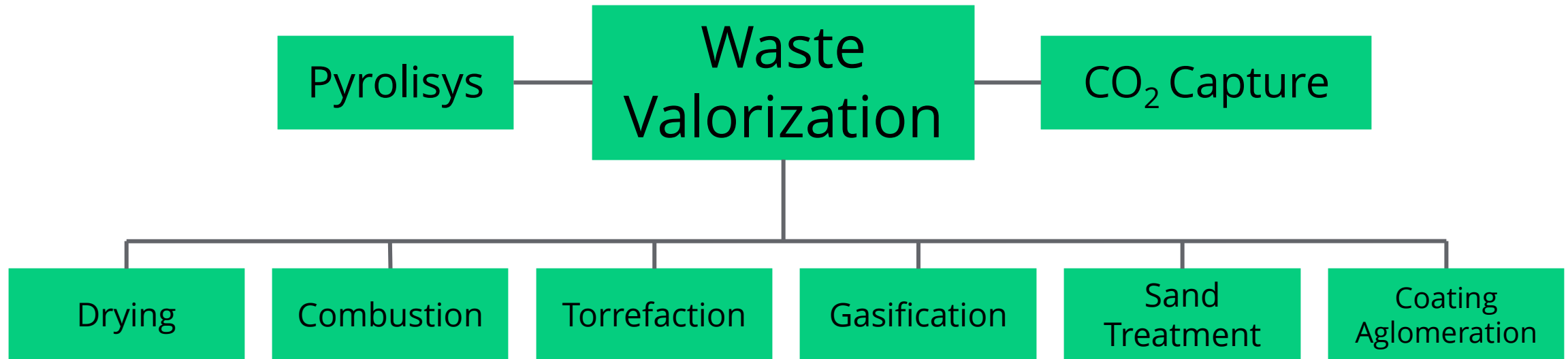
02 CLIENTS

- 01 Waste generators
- 02 Waste treatment companies





Flexible Technology:



MAIN PROCESSES

PYROLYSIS

INPUT



Tyres



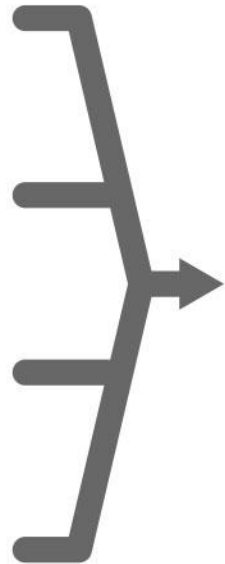
Biomass



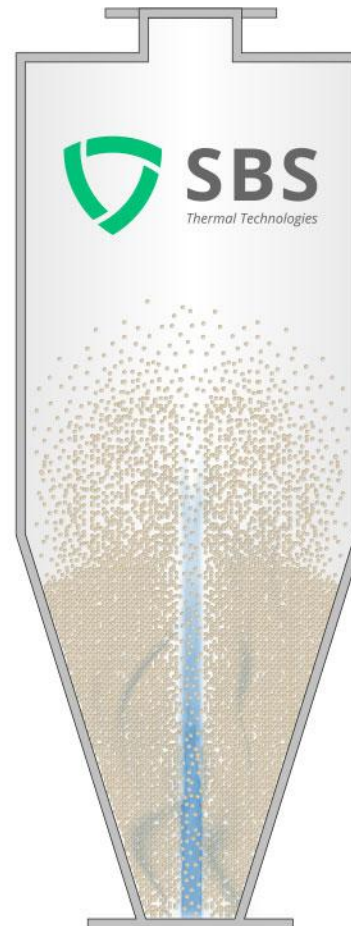
Plastics



MSW



**WASTE
CONDITIONING**



OUTPUT

**REVALORIZED
RAW MATERIAL
CONDITIONING**



Monomers



Biofuel



Carbon black



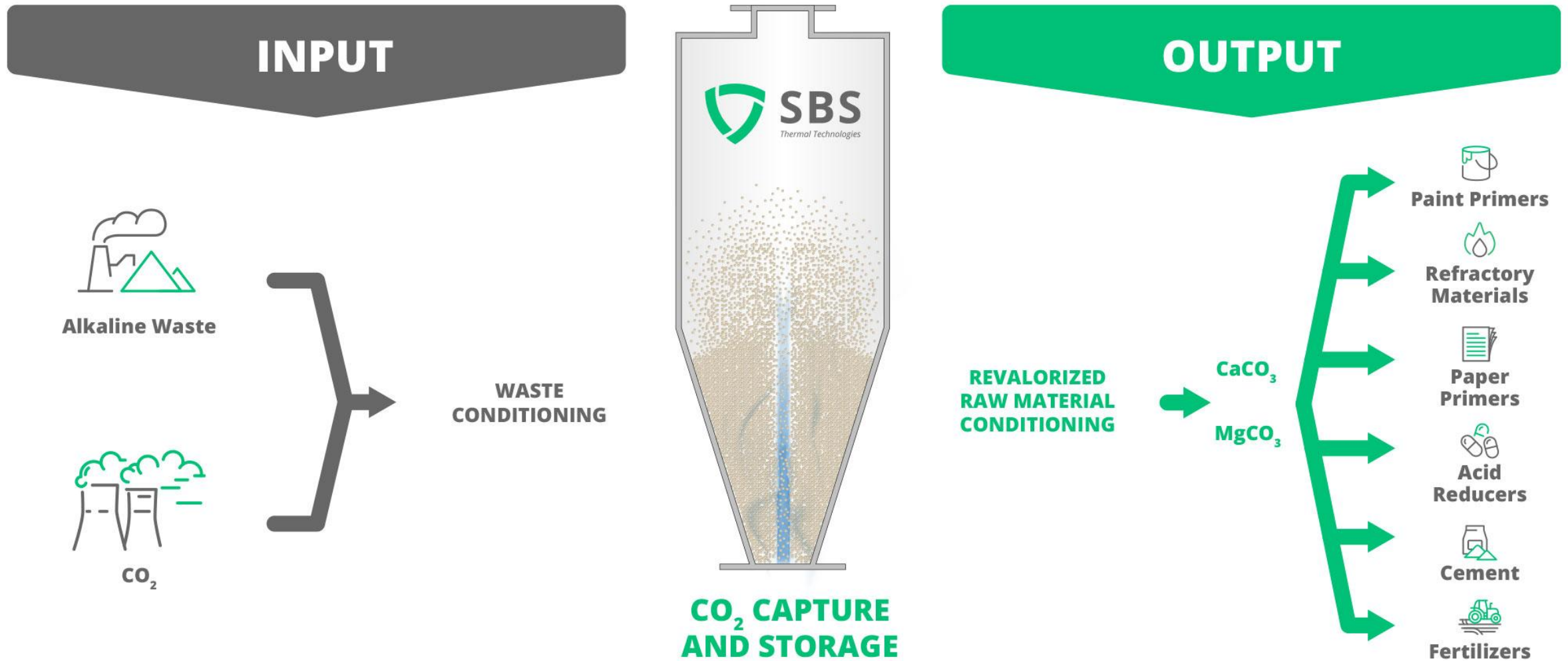
Hydrogen

PYROLYSIS



MAIN PROCESSES

CO₂ CAPTURE : 2 PROBLEMS → 1 SOLUTION



MINERALIZATION BY ACCELERATED CARBONATION– CCU (CARBON CAPTURE & USE)

Obtaining new minerals and circular materials with a negative CO₂ footprint

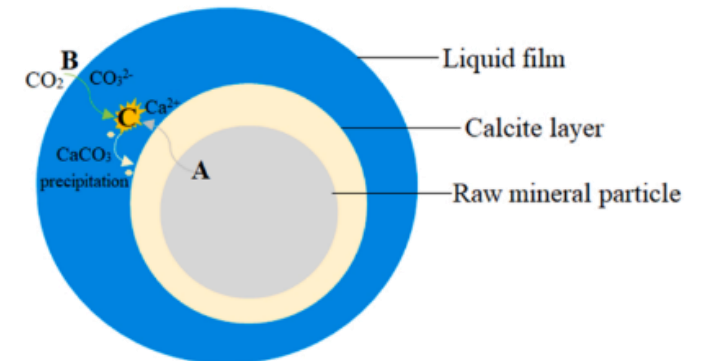
- Irreversible CO₂ capture
- Improved mechanical performance
- Increase recycling cycles
- Reduction of porosity-water absorption
- Volumetric stabilization
- Stabilization of heavy metals (Pb, Cr, Ba, etc.)
- Increase in pozzolanic activity
- Generation of new C-S-H gels

Carbonated alkaline waste

Steelmaking slags (EAF, LF, BOF)
RCD concrete
Cement waste (“kiln dust”)
Ash and slag (biomass, paper, MSW)
Limestone and mineral quarry mud (basalt, olivine)
Alkaline sludge (petrochemical, acetylene)



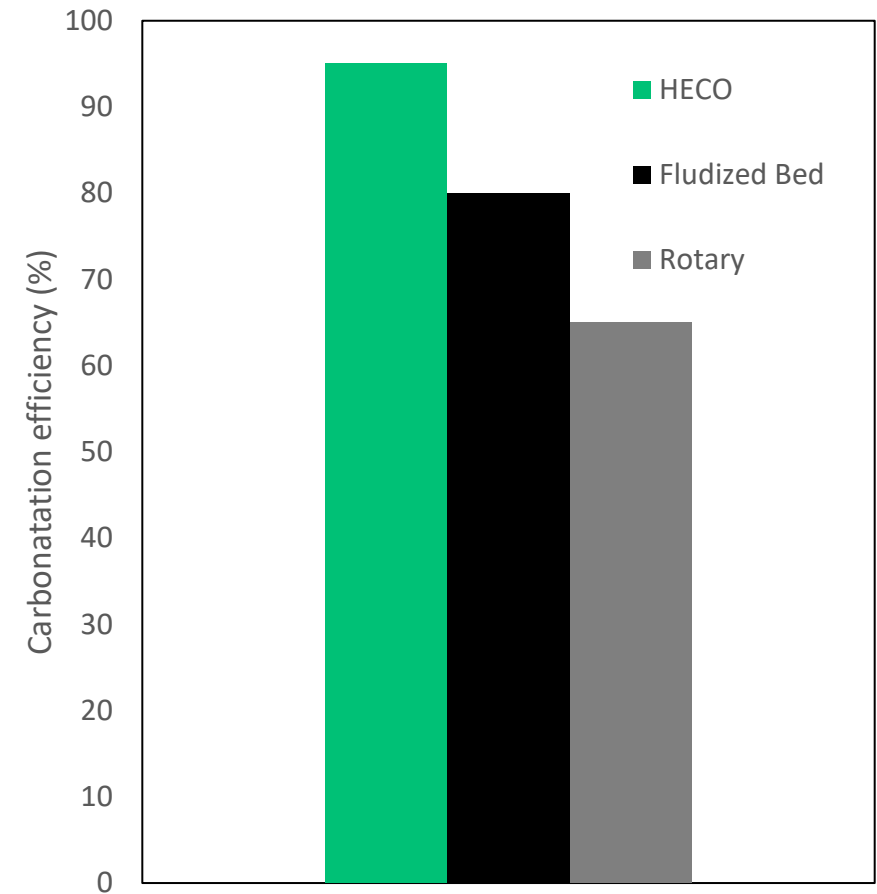
Structural and mineralogical transformation of waste



HECO® Technology, by SBS)

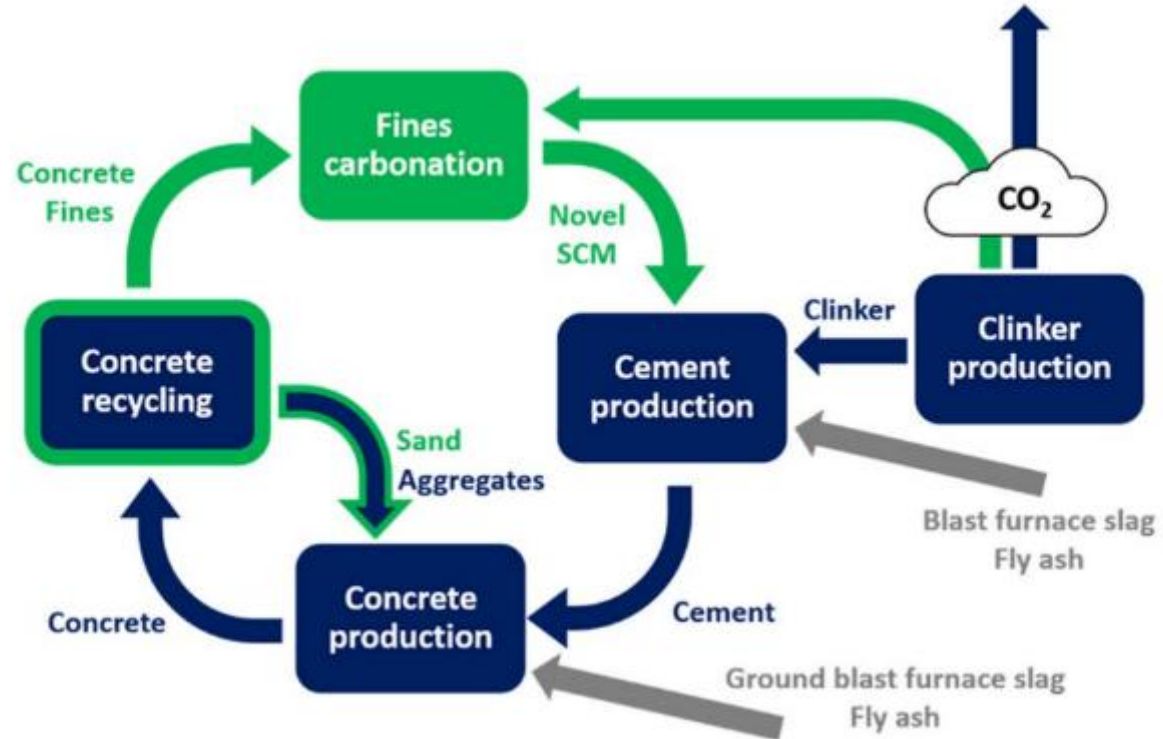
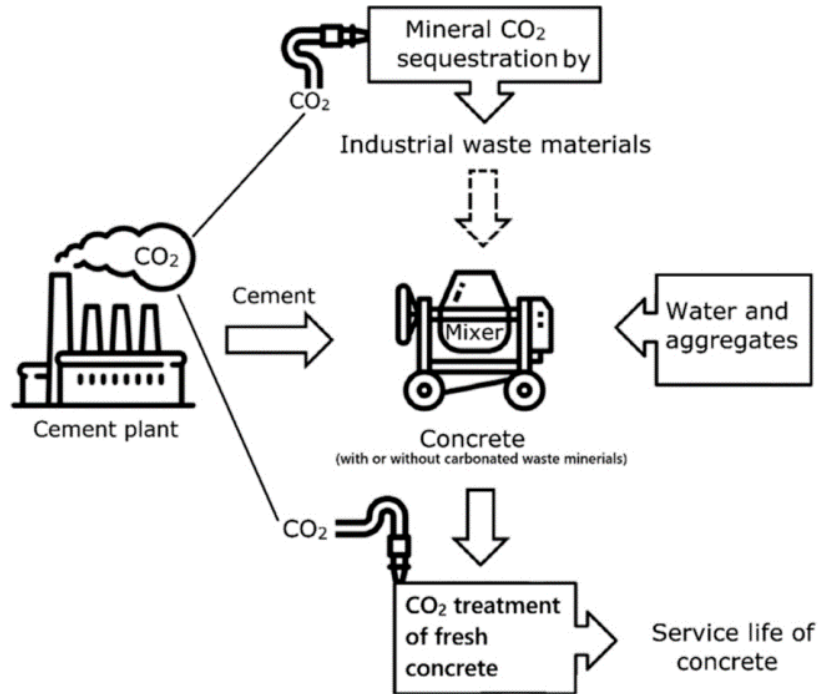
HECO® Advantages:

- HECO® (High Efficiency Contact) **gas/solid contact technology** with **very high efficiency** based on “spouted bed” technology.
- Simplicity and compactness of the system.
- Wide range of particle sizes (<63µm to 40mm).
- Final product with low humidity.
- Batch and continuous processing.
- Compatible with multiple continuous monitoring systems.
- Competitive cost, low maintenance and low energy consumption.



CASE STUDY

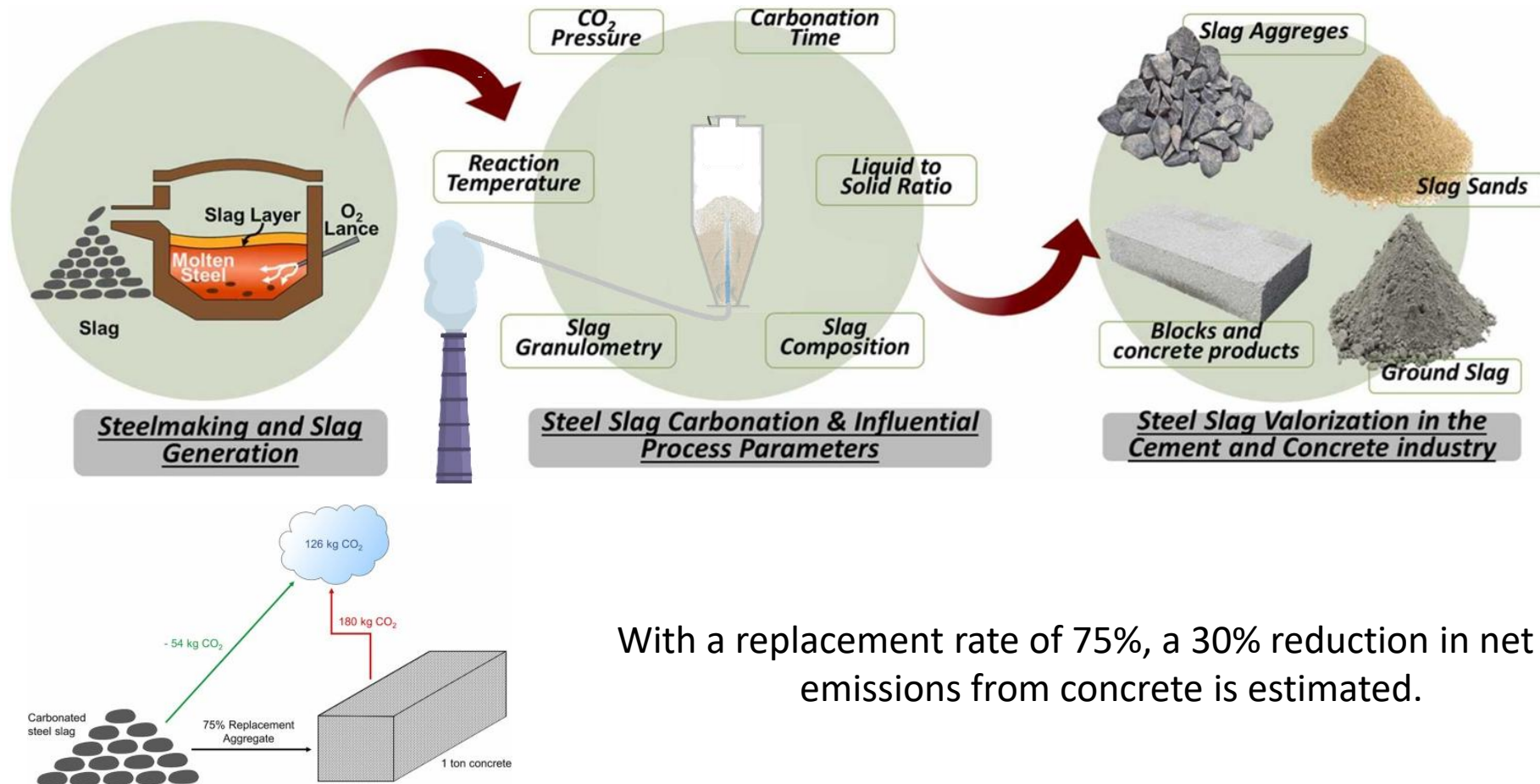
Concrete fines



**Circularity
+
 CO_2 capture**

CASE STUDY

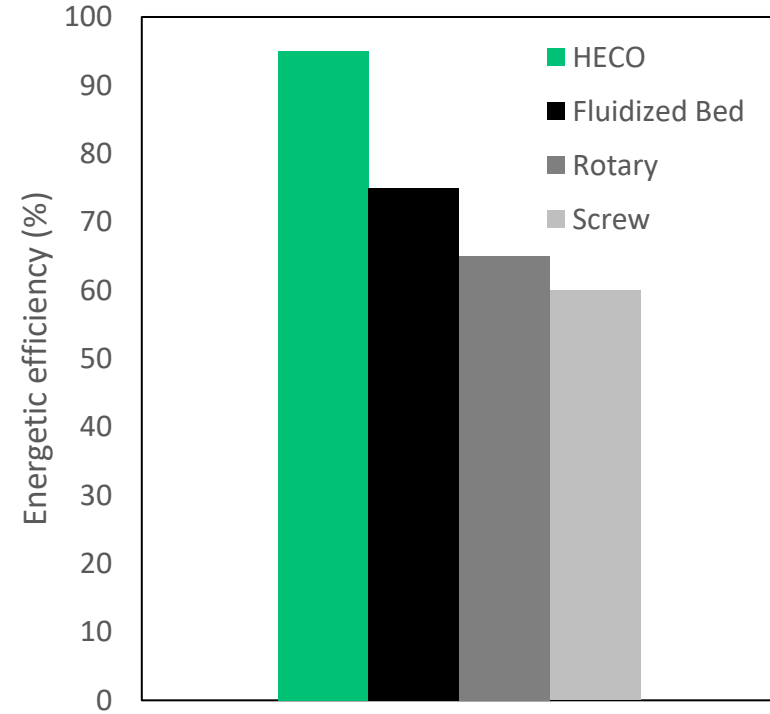
Steel Slags



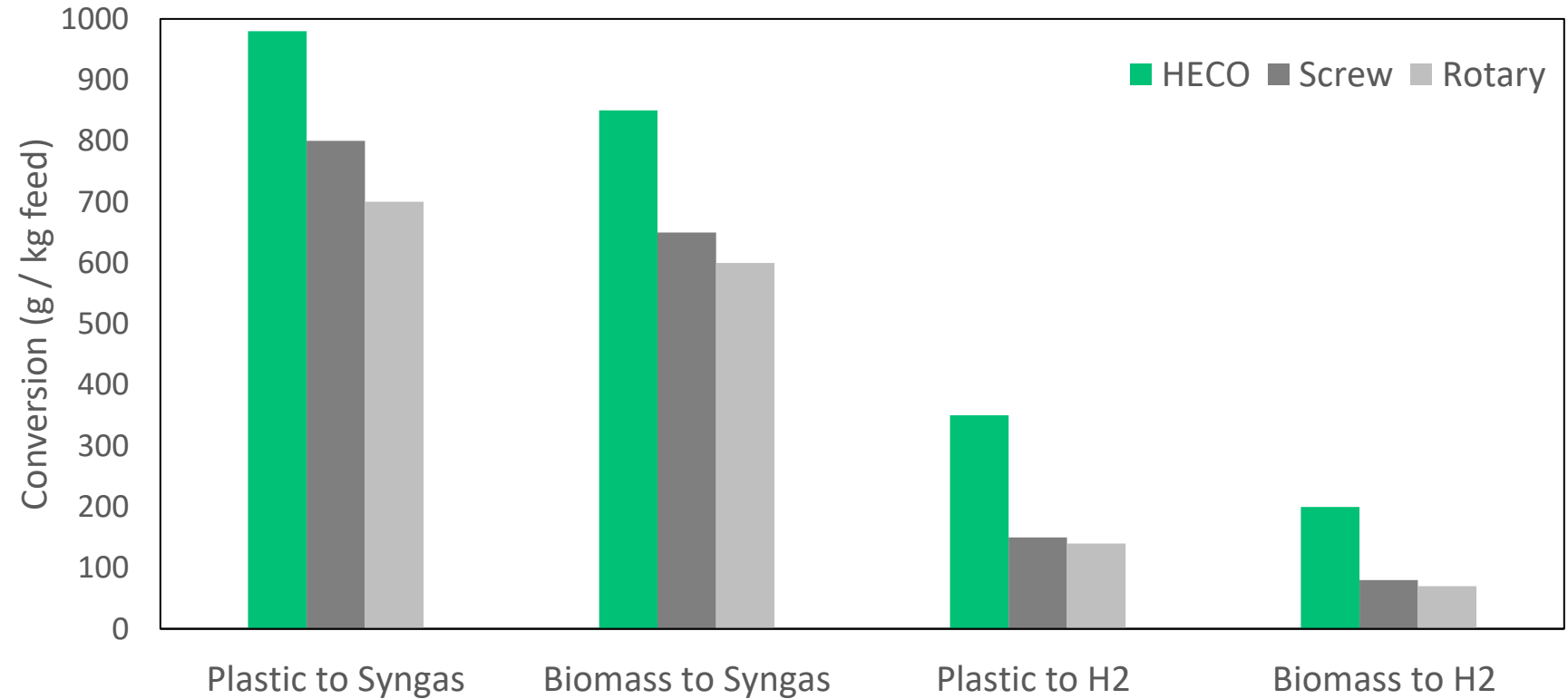
With a replacement rate of 75%, a 30% reduction in net CO₂ emissions from concrete is estimated.

OTHER

DRYING



GASIFICATION



CLIENTS & PROJECTS

PYROLYSIS



Energy for
generations

Industrial Blansol sa



CO₂ CAPTURE



HEIDELBERGCEMENT
HISPANIA



Tradecowall



**CEMENTOS
CRUZ**



OTHERS



sener



GUTRAM

Tefal



MOYUA

From research to industry



Develop & scale-up plant

- Hydrodynamic study
- Scale up
 - Size (bigger reactor)
 - Number (multireactor)

From research to industry



Validation of:

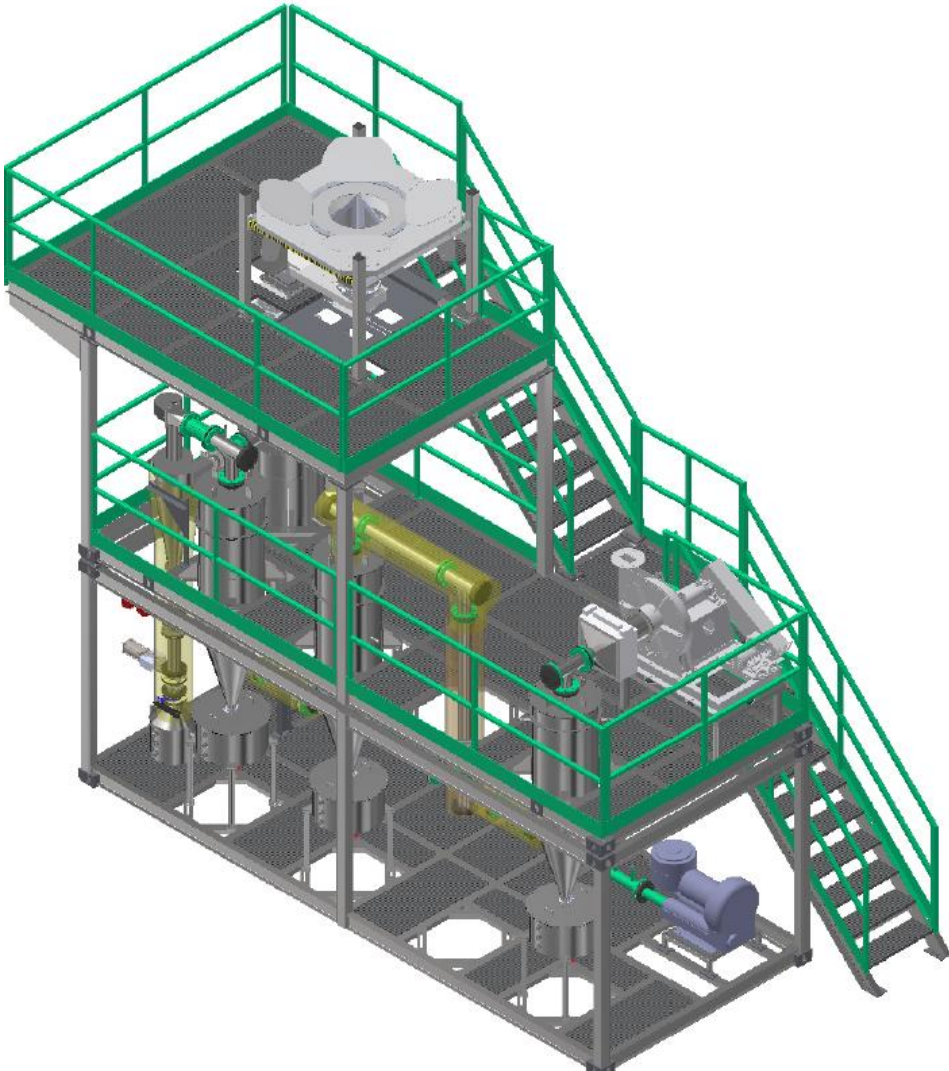
- Drying
- Pyrolysis
- Sand Treatment
- CO₂ Capture

Demonstration TRL7 plant

ENKARTERRIBIO project

To process:

- Thermoplastics
- Composites
- Biomass



TEAM



**Business Development
Manager**

Aitor Pablos



**Project
Manager**

Mikel Errasti



Designer

Asier De Celis



**Development
Technician**

Pamela Ensunza



Managing Director

Lic. Gonzalo Prat



**Business Development
Manager**

Dr. Aitor Pablos



**Product Development
Manager**

Prof. Roberto Aguado



Operations Director

Ing. Eduardo Varona



Technical Manager

Dr. Jorge Vicente



**Product Development
Manager**

Prof. Martin Olazar





SBS

Thermal Technologies

IX Vodafone Deia Innovation Sariak 2023

Organizadores:

**Premios
Handira JO
Sariak**

EMPRESA PROIEKTUA IZATEKO AUKERA DUEN
UPV/EHUko DOKTOREGO TESI ONENARI
A LA MEJOR TESIS DOCTORAL UPV/EHU
CON OPORTUNIDAD DE SER UN PROYECTO EMPRESARIAL

Organizadores:

bbk

EKIN

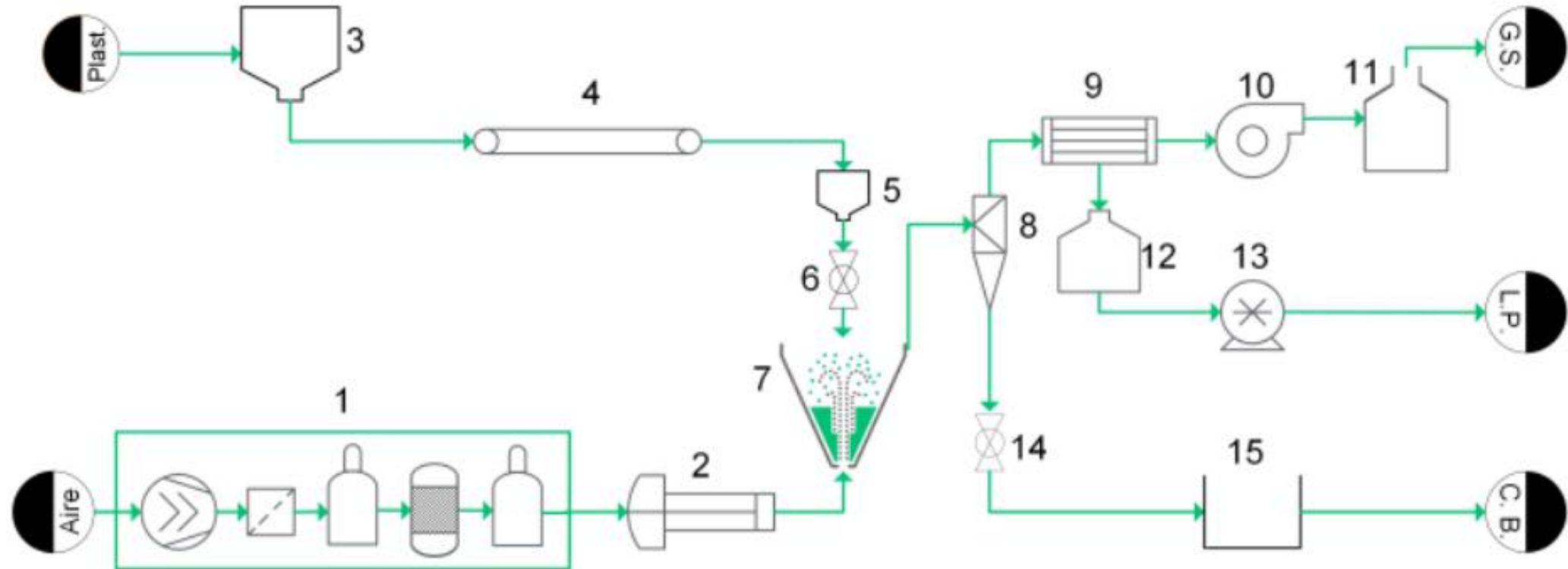
Empieza a trabajar en tu sueño



QUALITY
INNOVATION
AWARD



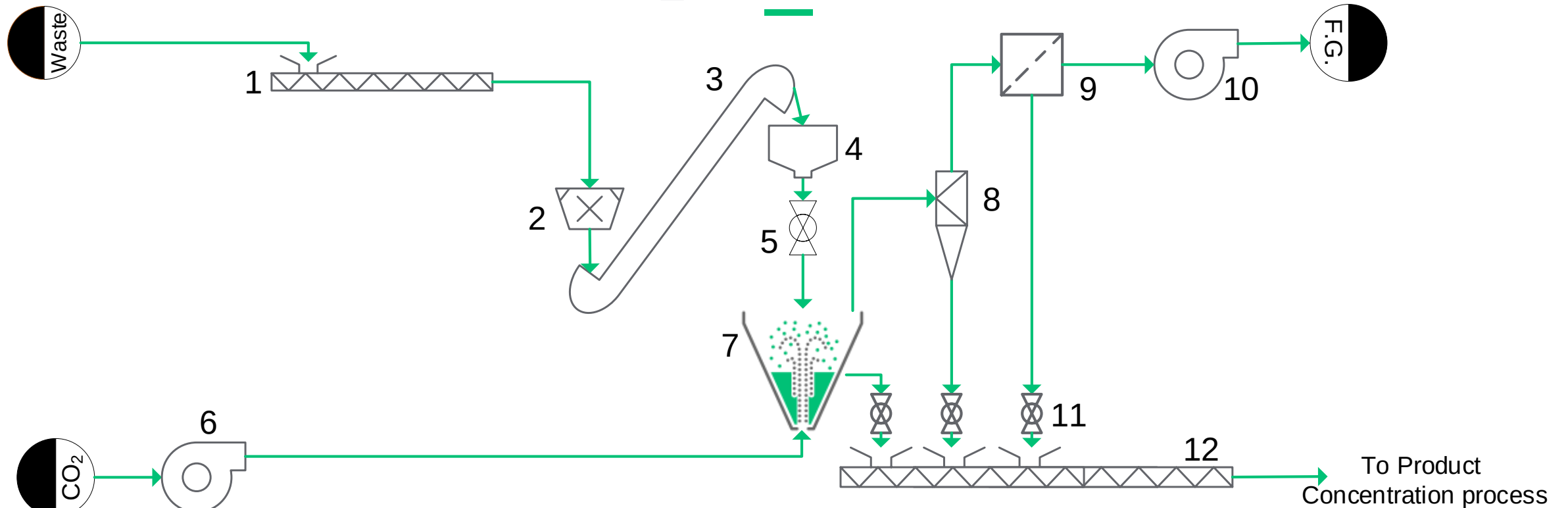
PYROLYSIS



- 1- Nitrogen Generator
- 2- Heating boiler
- 3- Primary feed hopper
- 4- Tubular conveyor
- 5- Secondary feed hopper
- 6- Feeder
- 7- Feeding valve

- 8- HECO reactor
- 9- Cyclone
- 10- Condenser
- 11- Tail fan
- 12- Pyrolytic liquid tank
- 13- Char discharge valve
- 14- Char Black tank

CO₂ CAPTURE

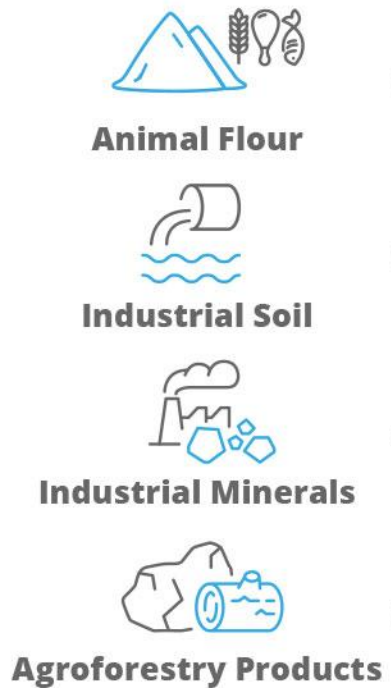


- | | |
|---------------------------------|----------------------|
| 1. Feeder | 7. HECO reactor |
| 2. Mill (Not mandatory) | 8. Cyclone |
| 3. Conveyor | 9. Bag Filter |
| 4. Hooper | 10. Fan |
| 5. Feeding Valve | 11. Discharge valves |
| 6. Blower (Flue gas connection) | 12. Product Conveyor |

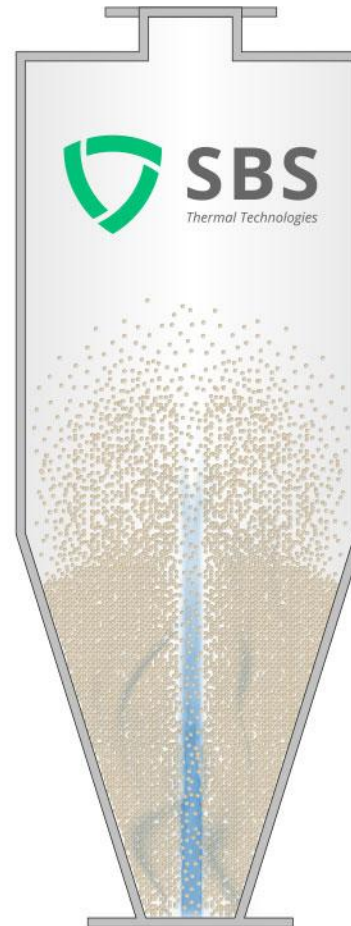
OTHER PROCESSES

— DRYING

INPUT



WASTE CONDITIONING



OUTPUT

REVALORIZED RAW MATERIAL CONDITIONING



OTHER PROCESSES

SAND TREATMENT

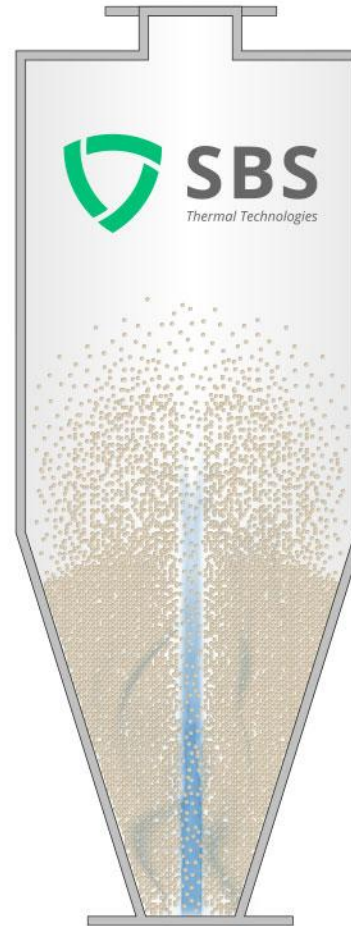
INPUT



Foundry Sands



**WASTE
CONDITIONING**



OUTPUT

**REVALORIZED
RAW MATERIAL
CONDITIONING**



**Sands without
organic layers**

OTHER PROCESSES

GASIFICATION

INPUT



Biomass



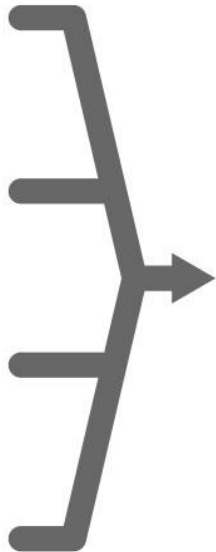
Plastics



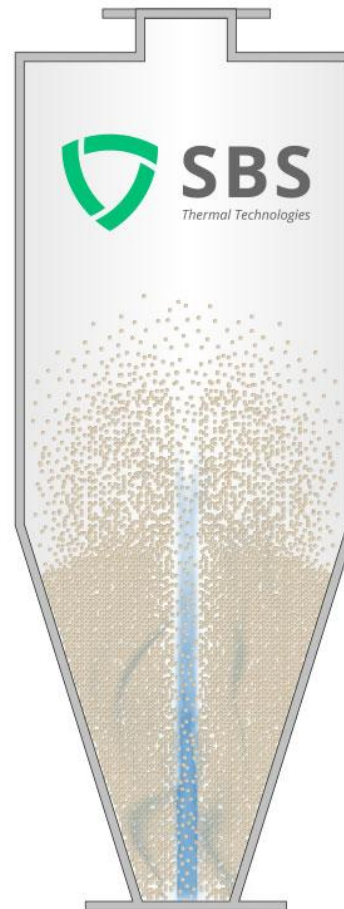
Tyres



MSW



**WASTE
CONDITIONING**



OUTPUT

**REVALORIZED
RAW MATERIAL
CONDITIONING**



Syngas

OTHER PROCESSES

ROASTING

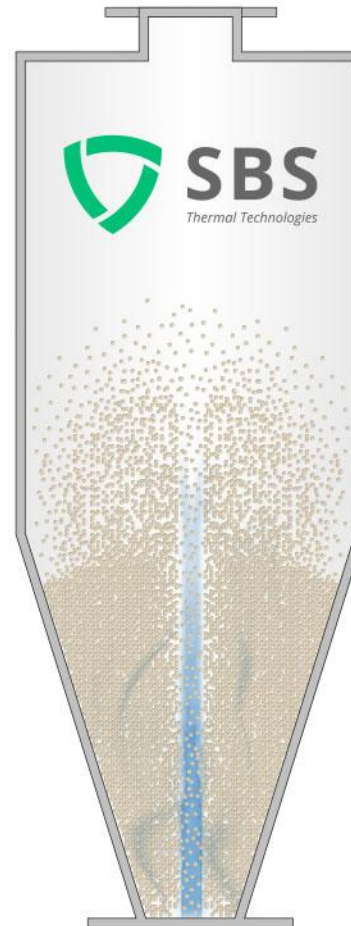
INPUT



Biomass



**WASTE
CONDITIONING**



OUTPUT

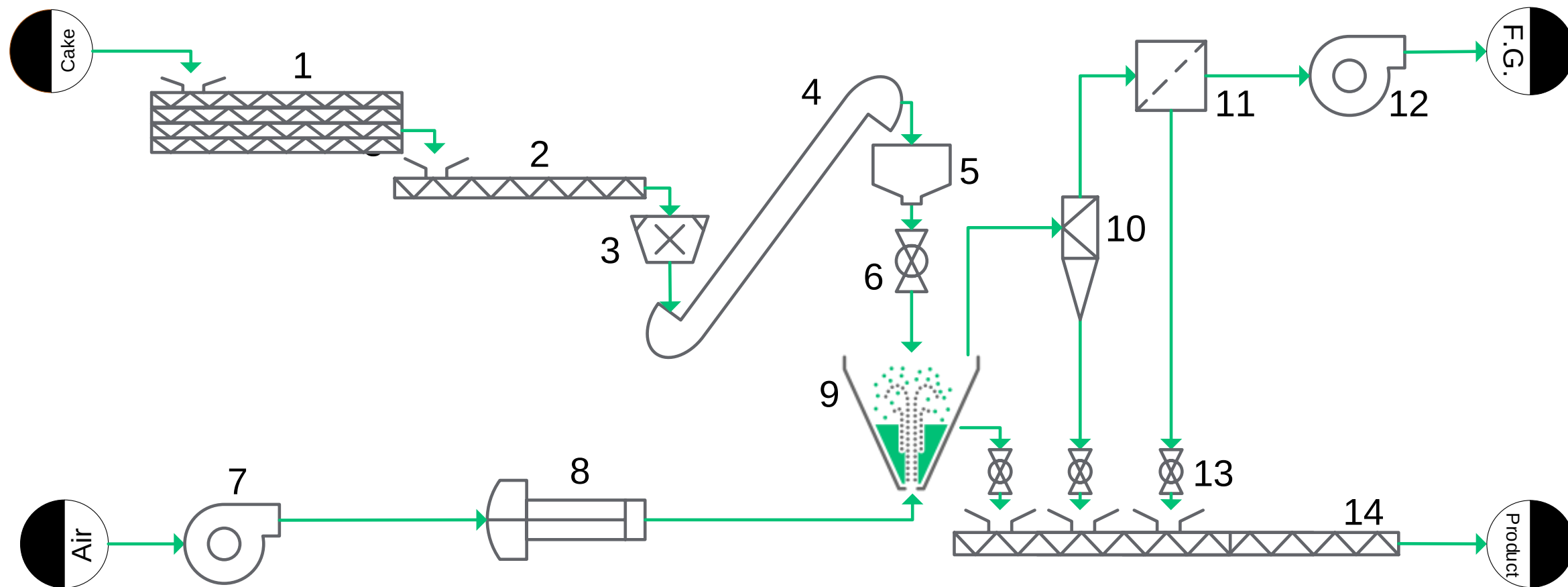
**REVALORIZED
RAW MATERIAL
CONDITIONING**



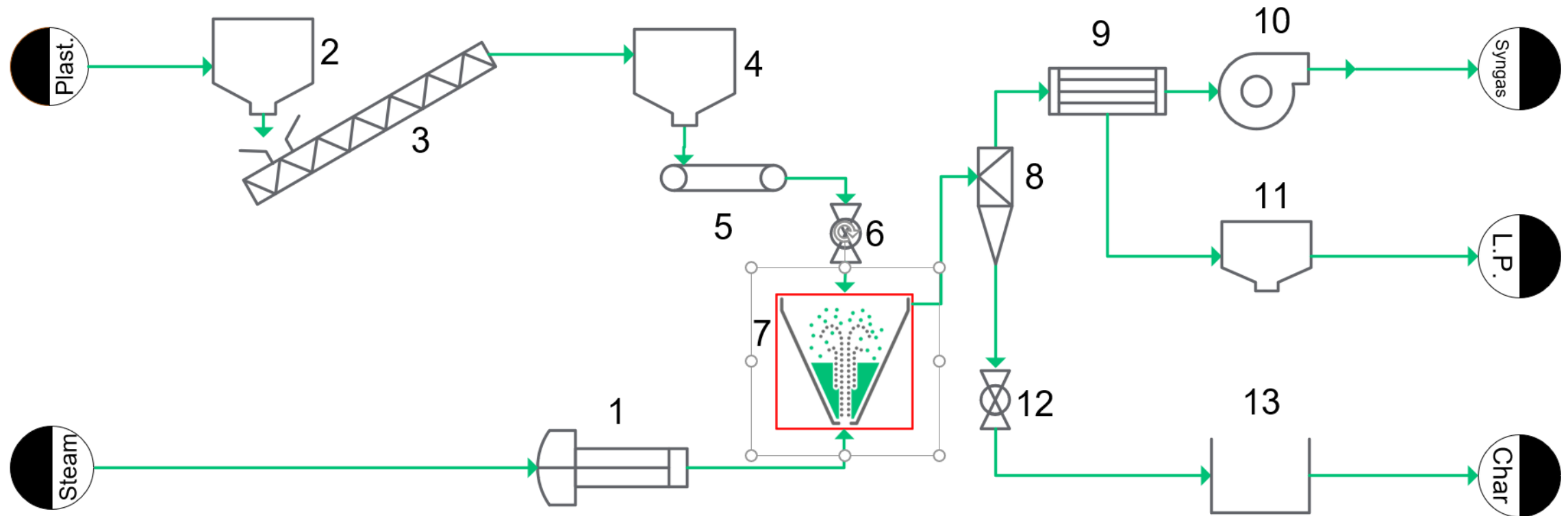
Bio-Coal

DRYING

SCHEME



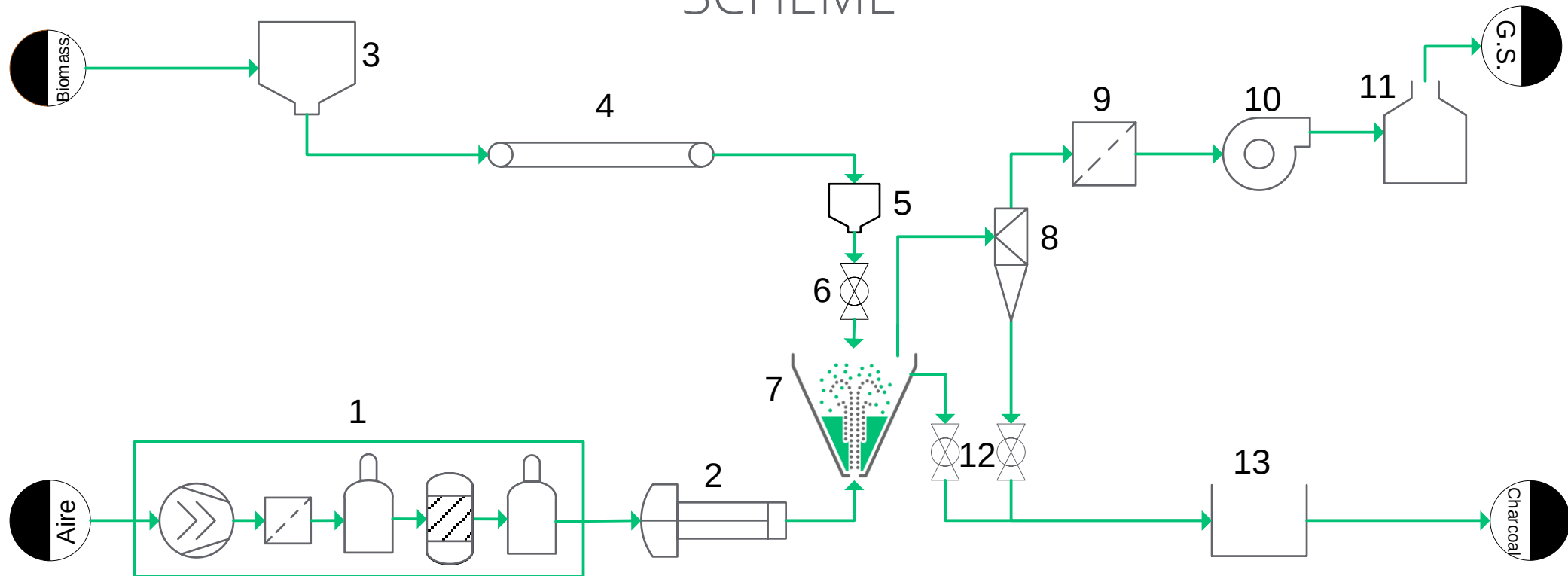
GASIFICATION



- 1- Heater
- 2- Primary feed hopper
- 3- Tubular conveyor
- 4- Secondary feed hopper
- 5- Feeder
- 6- Feeding valve
- 7- HECO reactor with

- 8- Cyclone
- 9- Condenser
- 10- Blower
- 11- Liquid tank
- 12- Char discharge valve
- 13- Char tank

ROASTING — SCHEME



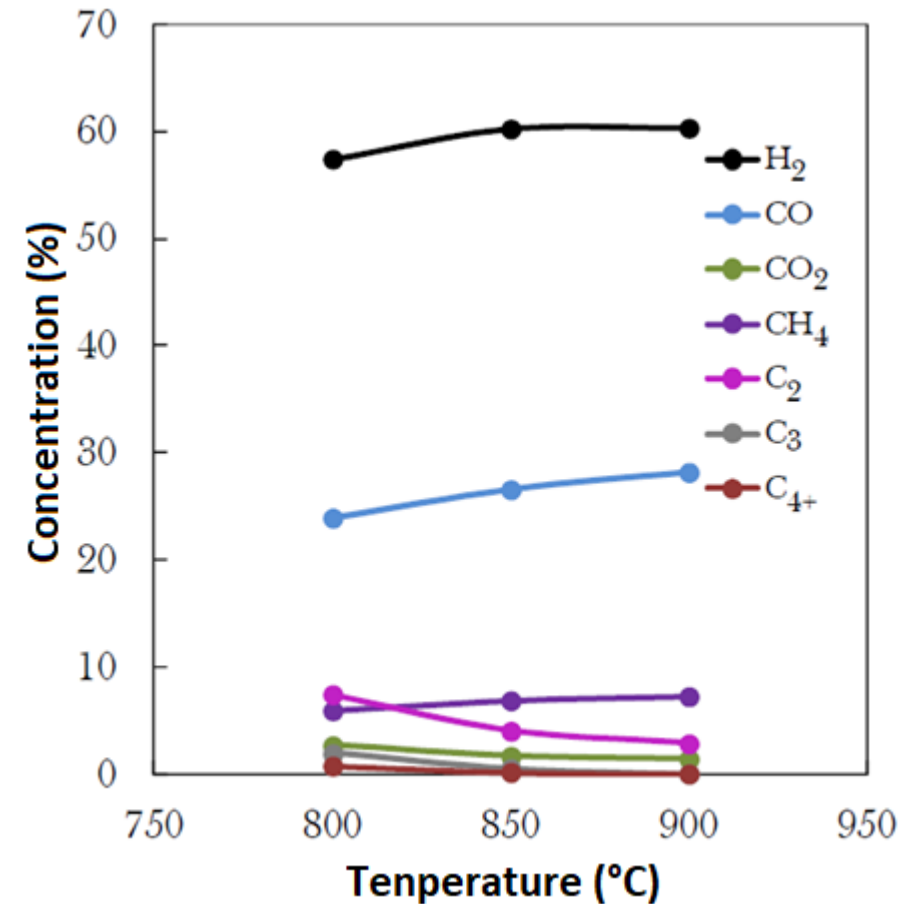
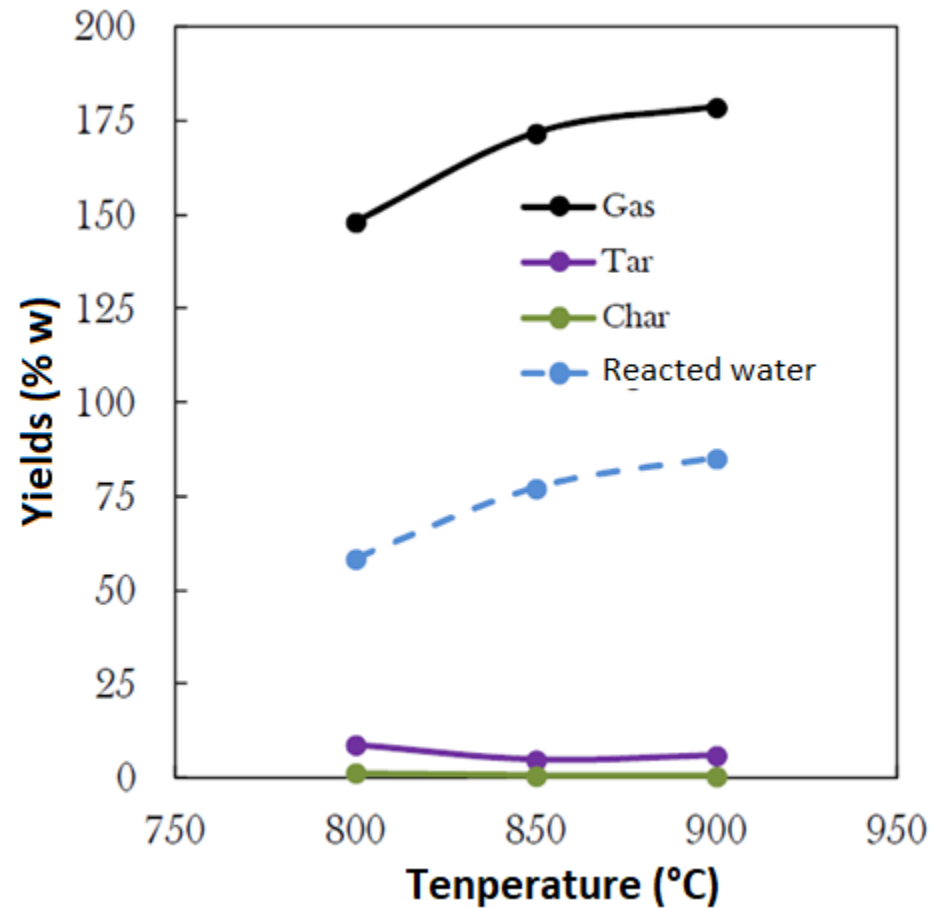
- 1- Generador de Nitrógeno
- 2- Calderín calefactor eléctrico
- 3- Descargador Big bag
- 4- Dosificador con pesaje
- 5- Tolva de alimentación secundaria

- 6- Válvula de alimentación
- 7- Reactor HECO
- 8- Ciclón
- 9- Filtro de mangas

- 10- Ventilador de cola
- 11- Depuración de gases
- 12- Válvulas descarga de Charcoal
- 13- Depósito de Charcoal

GASIFICATION

PLASTIC GASIFICATION YIELDS



GASIFICATION

BIOMASS GASIFICATION YIELDS

