



H2LIFE FOR VALORIZATION OF INDUSTRIAL COFFEE WASTE TO CLEAN ENERGY

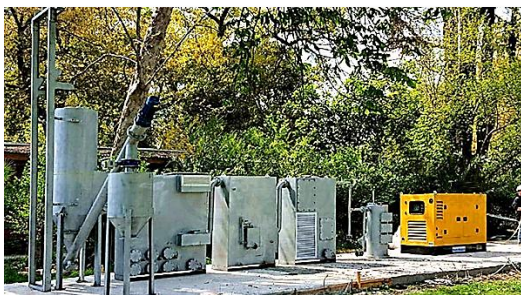
Executive Summary

The **H2Life Biomass E-Generator**, developed, produced, and distributed by **EWA Technologies Group**, offers a sustainable, non-incinerating, and high-efficiency solution for the valorization of biomass and other organic waste to low carbon emission - clean energy. This innovative technology converts such waste into steam or electricity for industrial use, including for the **coffee industry**.

H2life initiative committed to sustainable production, circular economy, and carbon neutrality, in relation to gasifying coffee waste, including coffee pulp and coffee husks. The use of H2life contributes to reducing reliance on fossil fuels, mainly for production of steam, essential for the coffee process, and lowering operational energy costs.

The **H2Life Biomass E-Generator** is a cutting-edge system that transforms agricultural and organic waste into clean energy in the form of **electricity, steam, synthetic natural gas (SNG), and green hydrogen**. Unlike pyrolysis, H2Life uses an advanced form of gasification, employing a non-incinerating, low-carbon thermal process to convert a wide range of carbon-based feedstocks into synthetic gas (syngas). This syngas is then used to produce steam or direct green electricity via a sophisticated syngas e-generator, with no harmful gas emission and minimal carbon dioxide.

H2Life is engineered to deliver **no less than 600 kWh of green electricity or 10 GJ of heat (equivalent to 3T dry steam) per ton carbon-based material**. We estimate that integration of H2life within the coffee industry will solve the treatment of biomass waste of the coffee process, contribute to reduce carbon emission and will reduce energy cost, mainly related to fuel or gas consumption for steam production.





About EWA Group

Founded in 2016, **EWA Technologies Group** is a pioneering global consortium specializing in the research, development, and distribution of solid waste recycling and sustainable waste-to-energy conversion solutions.

The Group's proprietary technologies are marketed under the **Hygimed®**, **H2Life**, and **IQS** brands, all exclusively developed and distributed within its own network, not through distributors or online sale's platforms.

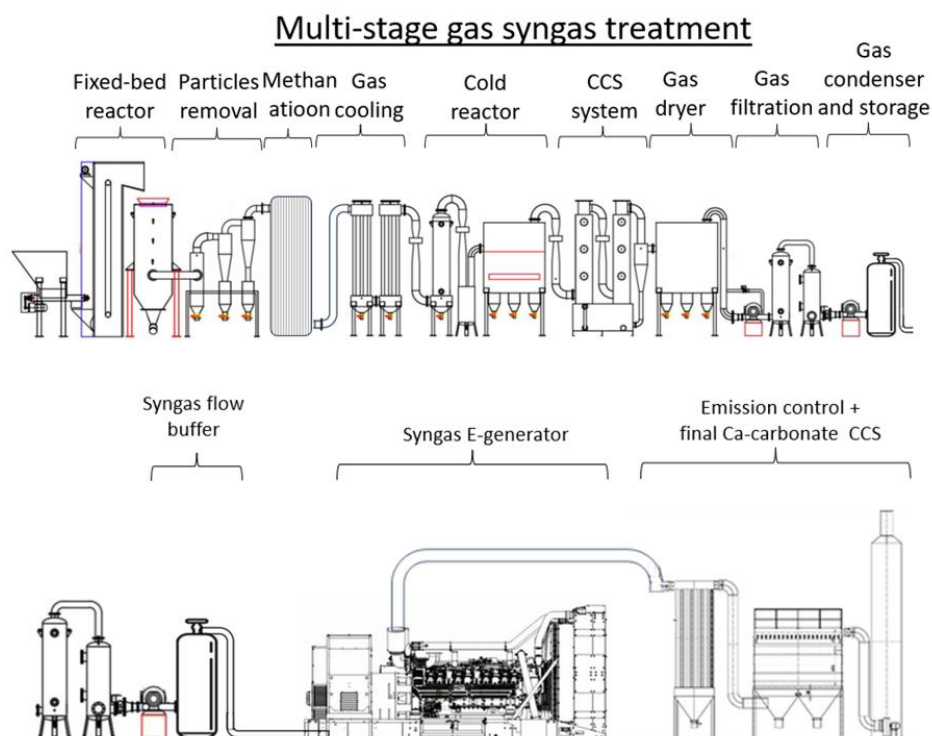
EWA Technologies Group is committed to continuous innovation and scientific excellence. The company has earned industry recognition and maintains **CE** and **ISO** certifications, reflecting its dedication to quality and environmental responsibility.

About H2LIFE System

The **H2Life System** is designed to convert up to **95% of dry carbon-based material into syngas**, maximizing energy production from biomass while minimizing environmental impact.

Unlike pyrolysis, which typically converts only around **14%** of dry feedstock into syngas, with the remainder becoming carbon black and synthetic fuel, that carries similar environmental drawbacks to fossil fuels, **H2Life** achieves over **95% conversion efficiency** into syngas **without requiring additional energy input**.

This makes the H2Life system a highly efficient and environmentally responsible alternative for sustainable energy generation.





H2Life Process: Four Key Stages

1. **Pre-treatment** – Homogenizes and standardizes any carbon-based material into a uniform feedstock.
2. **Gasification** – A non-incineration thermal process operating at moderate temperatures (200–700°C), converting biomass into synthetic gas (syngas) with **no harmful gas emissions**.
3. **Syngas Purification & Enhancement** – Includes hydrogen enrichment and refinement for clean energy use and Carbon Capture system (CCS).
4. **Energy Production** – The purified syngas is used to generate **green electricity, steam, synthetic natural gas (SNG), or hydrogen**.

The H2Life system is **AI-driven, fully automated**, and available in **21 models** ranging from **10 to 1,000 kWh per day**. Its compact and modular design requires as little as **40 to 150 m²** of space.

Biomass to Clean Energy: Coffee Pulp and Husk

The H2Life gasification system offers a sustainable solution for converting **coffee pulp (CP)** and **husk (CHs)** into clean energy such as steam or green electricity.

According to scientific literature, **CHs** consists of **73–85% carbohydrates**, including approximately **55% cellulose and hemicellulose** and **24% lignin**. These components are ideal for syngas production rich in hydrogen, which can then be used to generate energy. Seventeen percent of moisture, as published, is below the maximal level of water content requires for gasification. **In relating to CP, the available data are not consistent**, maybe because of high variation of water content, and accordingly **it is impossible to estimate the potential output by gasifying**.

Key Benefits of Gasifying Coffee Waste:

- **Environmental Contribution:** Significant reduction of agricultural waste.
- **Renewable Energy:** Clean energy for self-use or grid distribution.
- **Sustainable Development:** Fully aligned with circular economy principles.
- **Economic Advantage:** Converts waste into valuable resources, reducing production costs and earning carbon credits.

Specifically, for the coffee industry, syngas can replace conventional energy sources for:

- **Bean cleaning and sterilization**
- **Pre-heating and roasting**
- **Steam-driven drying processes**
- **Powering mechanical systems in processing plants**

Performance Potential of H2life to the Coffee industry

From **each ton** of coffee husks, H2life system is able to produce:

- **600 kWh** of green electricity **or**,
- **9.8 GJ** of thermal energy, sufficient to generate over **3 tons of dry steam at 300°C**.



This **decentralized and circular** model enhances energy resilience, lowers environmental impact, and reduces the energy costs of coffee processing operations.

Technical Advantages of H2Life Over Pyrolysis

- 1. Energy Efficiency**
H2Life produces electricity, steam, SNG, and hydrogen with high conversion rates, while **pyrolysis**, by contrast, primarily yields synthetic with similar characters of fossil oil, which require further distillation processing and not suitable for conventional engines.
- 2. Automation & Maintenance**
H2Life is **fully automated**, featuring AI-driven PLCs for 24/7 operation with minimal human oversight. **Pyrolysis** systems are labor-intensive, and require frequent maintenance.
- 3. Space Efficiency**
H2Life systems require up to **150 m²**, compared to minimal space of **375 m²** for equivalent **pyrolysis** setups.
- 4. Sensitivity to water**
H2Life accept feedstock containing up to 20% moisture, while **pyrolysis** can't effectively operated with more than 10% moisture.
- 5. Operational Reliability**
With **no moving parts**, **H2Life** boasts greater durability and fewer mechanical failures. **Pyrolysis** systems involve heavy, rotating components that are more prone to wear.
- 6. Environmental Impact**
H2Life operates **smoke-free**, produces **no wastewater**, and captures CO₂. It is one of the eco-friendliest **biomass valorization** technologies available. **Pyrolysis**, on contrast, consume more than 2KWh electricity for each to of biomass/h, while the need for continuous heating of the reactors consumes at least 200kg of fuel/syngas per hour, expressed by emission of smoke and carbon dioxide.

Carbon Credits & Sustainability Incentives

Because the **H2Life** system qualifies as a **renewable energy** technology, users are eligible for **carbon credits** and **green subsidies**. These benefits can help offset capital investment and improve the financial attractiveness of the technology for agro-industrial stakeholders.

Financial & Operational Benefits

- **Energy Output:** Up to **600 kWh** electricity or **3 tons of steam per hour per ton CHs**
- **Sort ROI:** Payback within **10–12 months** in case of electricity and significantly shorter in case of steam, depending on energy costs and biomass availability
- **Flexible Feedstock:** Compatible with a variety of organic materials, including plastic or biomass-plastic mix.
- **Scalable & Modular:** With 21 different models, H2life is ideal for both small and large operations, up to 1.5T feedstock per hour.
- **Low Operating Costs:** Highly automated with minimal maintenance
- **Compact:** Small footprint with no need for fuel, water, or solid waste disposal
- **100% Circular:** No pollution, low carbon emissions, and full resource utilization



EWA TECHNOLOGIES GROUP

Saving the environment



Our Proposal

If you trust us, invest in a system based on your current biomass waste amount.

However, if you are unsure, start with a **small-scale system** and test our technology.

If you're satisfied, we will **refund the cost of the small system** upon purchase of a **large-scale unit**. If you're satisfied, we will **buy the system back from you** - no risk involved.

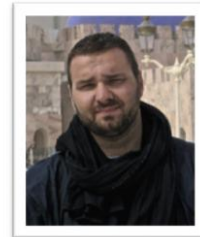


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