

# PYROLYSIS ADVANCED GASIFICATION IN HYDROGEN PRODUCTION



In Association with SVCH-Technologii, Moscow (Russia)  
ISO 9001:2015 | ISO 14001:2015 | ISO 45001:2018

# ABOUT US

KERONE is now renowned for serving the specialized needs of customers with the best quality and economical process of Heating /cooling and drying products, manufactured in a high-quality environment by a trained and qualified workforce (special purpose machinery)

-  48+ Years Manufacturing Excellence
-  Great Sale Support
-  Highly Customized Product
-  Adherence to Standards
-  Sound Infrastructure
-  Team of experts Delivering Quality
-  Timely Delivery
-  Cost Effective Solutions



KERONE is a pioneer in application and implementation engineering with its vast experience and team of professionals.



KERONE is devoteded to serve the industry to optimize its operations both economically and environmentally with its specialized heating and drying solutions.



KERONE is having immense expertise in manufacturing and implementing various types of engineering solutions.



KERONE is possessing employee strength of more than 280+ experts continuously putting efforts for happy industrial engineering solutions.

# WHY CHOOSE US

With decades of expertise, cutting-edge technology, and a customer-centric approach, Kerone Engineering offers tailor-made heating solutions that prioritize quality, flexibility, and cost-effectiveness. Benefit from our commitment to excellence, post-sales support, and innovative solutions for your unique heating needs. Choose Kerone Engineering for reliability, performance, and unmatched value.

## MISSION

- ✓ To enhance the value of customer operation through our customer need centric engineering solution
- ✓ We are committed to provide our customers, unique and best in class products in Industrial heating drying and cooling segment with strategic tie-up for the technical know-how with renowned leader in the industry specific segment

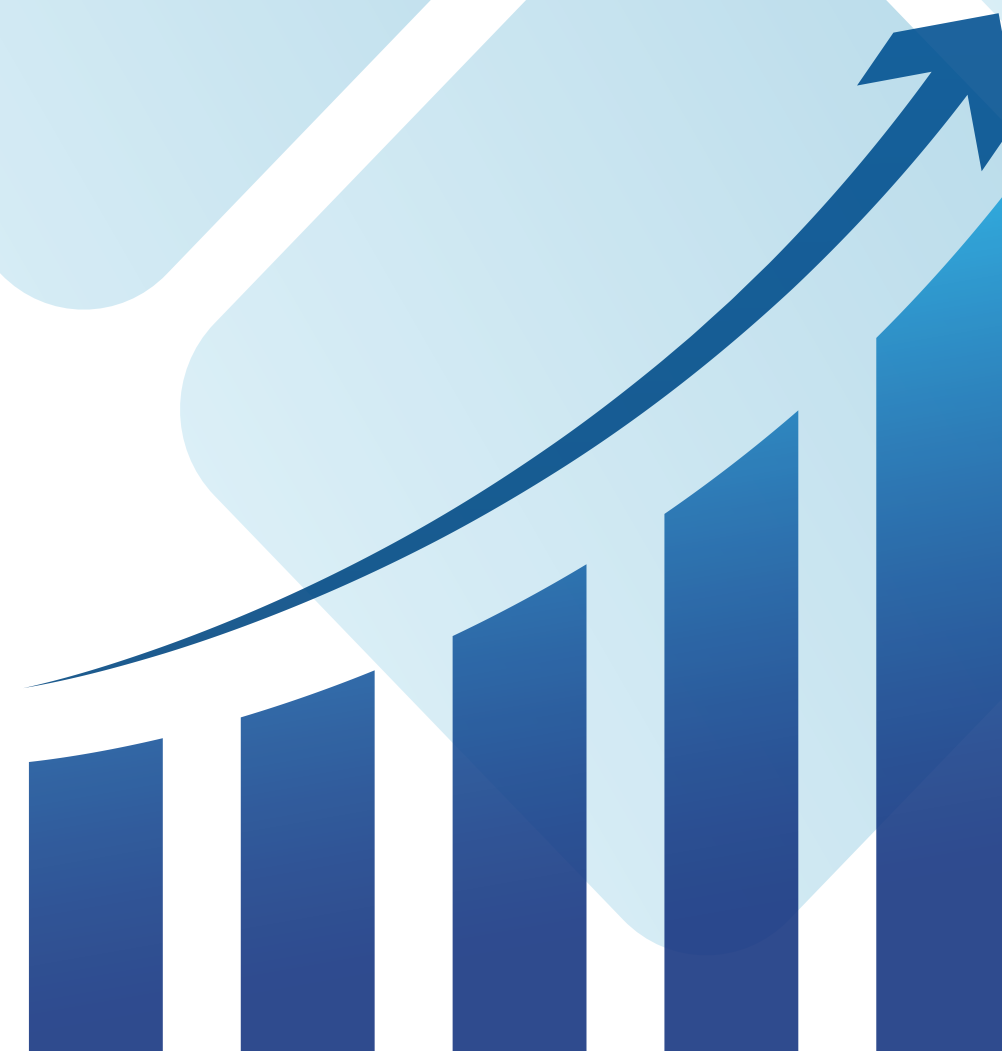
## VISION

- ✓ Turn into a world leader in providing specialized, top-notch quality and ecological industrial heating, cooling, and drying solutions across the globe.
- ✓ To attain global recognition as the best of quality and environment-friendly engineering solution company.

“

Enhance the value of customer operation through our customer need centric engineering solution.

”



## TECHNOLOGY OVERVIEW

### DEFINITION

Pyrolysis and advanced gasification are the thermal decomposition of feedstocks such as biomass or coal to produce hydrogen in high-temperature processes.

### EFFICIENCY

Both processes boast high conversion rates and offer carbon management possibilities with CCS.

### APPLICATIONS

Clean hydrogen, energy storage, and the production of synthetic fuel are required by industry.



## DEFINITION

### PYROLYSIS

The thermal decomposition process without oxygen degrades organic material into hydrogen, biochar, and syngas

### ADVANCED GASIFICATION

This process converts feedstock into hydrogen-rich syngas with the help of partial oxidation under high temperatures.

Both methods use heat to break the molecular bonds to produce hydrogen without combustion.



## COST STRUCTURE

### CAPITAL COSTS

These are high because the advanced reactors and preparation systems for feedstock and gas cleanup units are high-value investments.

### OPERATIONAL COSTS

The feedstock and energy represent variable costs depending on the type of feedstock used. Biomasses are normally cheaper than coal.

### FUTURE TRENDS

Improved reactor designs and economies of scale can lower costs.



## TECHNOLOGY READINESS LEVEL (TRL)

### TRL 6-8

These technologies have moved to full-scale commercial deployment with proven pilots and demonstration projects.

- Aside from increased hydrogen applications, pyrolysis is currently one of the most used ways to obtain biochar.
- Advanced gasification is already applied in large-scale plants, especially coal-to-hydrogen projects.

## PUBLIC STUDIES AND RESEARCH

- Along this line, studies have found advanced gasification combined with CCS to realize a typical carbon capture efficiency of more than 90%.
- Further research on pyrolysis efficiency improvement focuses on using catalysts to increase hydrogen yield.
- Life cycle assessments in pyrolysis confirm that renewable feedstocks substantially reduce greenhouse gas emissions.

## PROCESS STEPS

### FEEDSTOCK PREPARATION

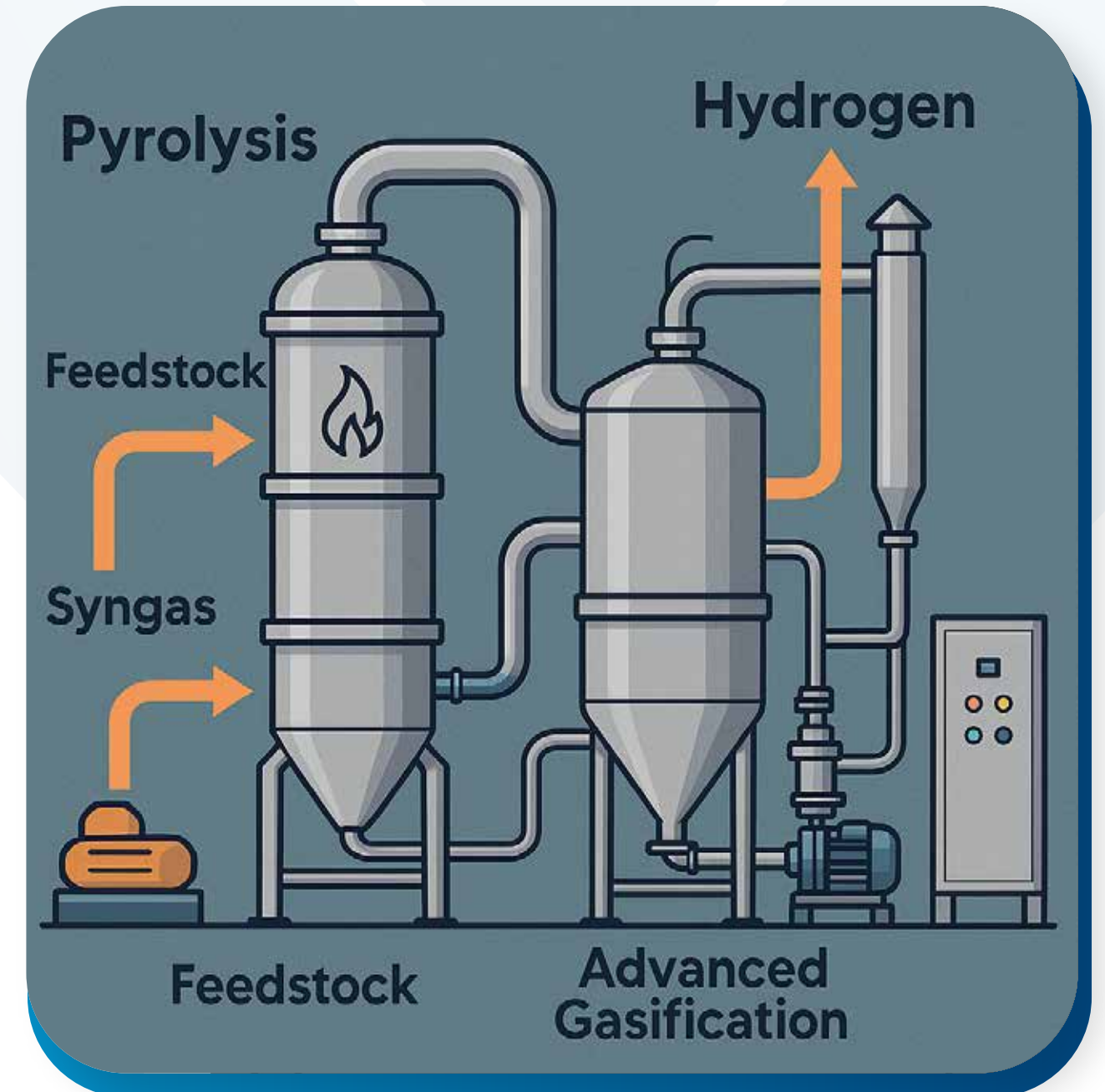
To facilitate an effective reaction, biomass, coal, or waste is pulverized into uniform particles.

### THERMAL DECOMPOSITION

High temperature decomposes material in a limited oxygen environment.

### GAS CLEANUP

Cleaning of Syngas is done to remove all the impurities like tar and sulfur compounds. Hydrogen is separated from the Syngas stream using pressure swing adsorption or membranes.



## BENEFITS

### DIVERSITY

Drawing on feedstocks ranging from agricultural residues to municipal wastes.

### HIGH EFFICIENCY

Advanced reactors boast high hydrogen yields with low resulting by-product emissions.

### CARBON MANAGEMENT

These technologies enable negative or near-zero emissions when combined with CCS.



## CHALLENGES

### FEEDSTOCK

Deployment in some regions is constrained by dependence upon good-quality, regular feedstock.

### HIGH COST

Capital-intensive setup and feedstock preprocessing raise the initial cost.

### TAR IS CREATED THROUGH GASIFICATION

Managing such by-products of the process adds complexity to operations.



## EXAMPLE APPLICATIONS

### INDUSTRIAL HYDROGEN

Hydrogen is supplied for ammonia synthesis, refining, and steel making.

### SYNTHETIC FUELS

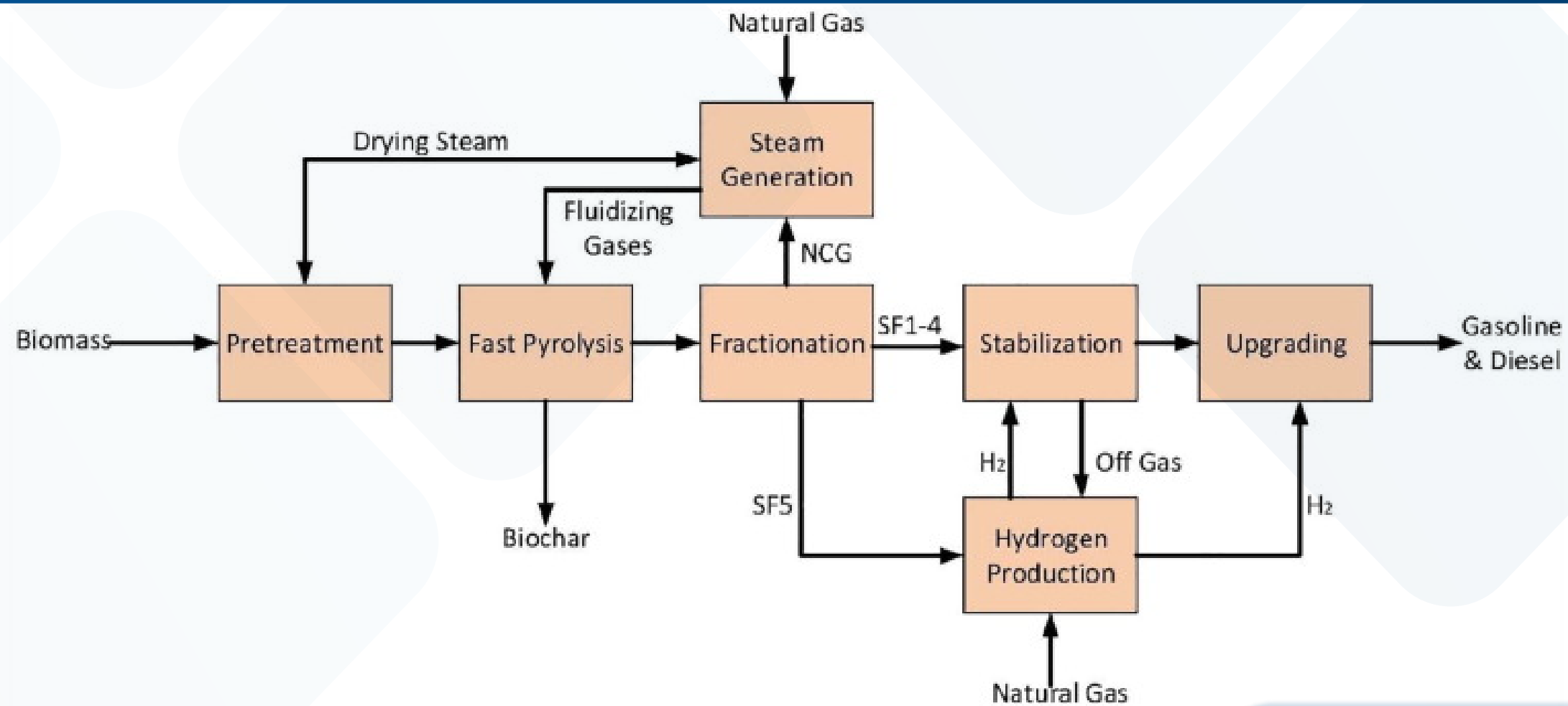
The Production of hydrogenbearing syngas to synthesize liquid transportation and aviation fuels.



## PROCESS DIAGRAM

### FIGURE

Flow diagram of pyrolysis and advanced gasification processes. Shows a comparison of hydrogen yields from biomass, coal, and municipal waste feedstocks.



## SUMMARY AND OUTLOOK

- | Pyrolysis and advanced gasification represent efficient pathways to hydrogen production in a versatile manner.
- | Their capability for different feedstocks makes them essential, particularly for regions with scarce renewable electricity. Policy incentives should also be provided to promote carbonneutral methods of hydrogen production.
- | Collaborate with industry and academia to develop scalable, integrated remedies for deployment worldwide.



# TRUSTED PARTNERS

**AFCONS**

**Technip**

**TÜV**

ISO 14001:2004

**TOYO**  
ENGINEERING

**EIL**

**LLOYD'S**

**ZEPPELIN**  
WE CREATE SOLUTIONS

**Reliance**  
Engineering  
Associates Pvt. Ltd.

**TATA**  
TATA CONSULTING ENGINEERS LIMITED

**SC Shroff** Consultants

**STERLING & WILSON**

# THANK YOU

## UNIT I

📍 4 & 5, Marudhar Industrial Estate, Panchal Road, Opp. Syndicate Bank, Bhayander (E), Mumbai-401105. (India)

📞 Contact Us  
+91-22 48255071, 48255072

## UNIT II

📍 Kerone Engineering Solutions LTD., Plot No. B-47, Addl. Midc Anandnagar, Ambernath (E), Dist. Thane (India)- 421506

📞 Contact Us  
+91(0251)2620542/43/44/45/46

### ✉ Our Mails

[info@kerone.com](mailto:info@kerone.com)

[sales@kerone.com](mailto:sales@kerone.com)

[marketing@kerone.com](mailto:marketing@kerone.com)

### 🌐 Website

[www.kerone.com](http://www.kerone.com)

[www.kerone.net](http://www.kerone.net)

[www.keroneindia.com](http://www.keroneindia.com)



SCAN HERE

