



PREVIEW

Biomethane Market Intelligence Report: North America and Europe

Market Intelligence

January 2024

Competitive Landscape

biogasworld.com

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A Word from the BiogasWorld Team

Dear BiogasWorld members,

In the year 2023, the biomethane market continued to exemplify its ability to innovate and the potential to valorize all segments along its value chain. New players are continuing to enter this fruitful market and grow alongside existing industry powerhouses. New regulations and standards of practice continue to favour market development and assert the role of biomethane in the decarbonization of industry. Indeed, the biomethane industry is uniquely positioned within international methane pledges and holds a vital role within the global waste management sector. The year 2023 was a significant year for the announcement of new facilities and the commitment of major industry stakeholders for building out their capacities with hundreds of new facilities by 2030.

The present document is our seventh edition of Biomethane Market Intelligence Report – Competitive Landscape, that became for our members a key reference and an influential part of their decision-making for their marketing and business development activities. We believe that the information included in this report plays an important role in our members' success in the biomethane market and we strive to increase its value to our clients.

What is new in this edition?



New Biomethane Projects

More than [REDACTED] projects in total.



Updated Analysis

Updated information from [REDACTED] major industry players.



Updated Information on Capacity

New maps featuring the market presence of suppliers.



New Upgrading Suppliers

Information on new technology suppliers entering the market.

In summary, this document and all BiogasWorld actions aim to help the industry connect and grow worldwide. We now have over 170 clients and partners in 30 countries. Join us and take advantage of this professional network or use our continually expanding services to reach your own business goals.

Sincerely,
Your BiogasWorld Team

Biogas Upgrading - Technology Suppliers

In recent years, the biogas upgrading market has been in strong development phase with many companies on the market to offer their solutions. The figure below presents the major players (in alphabetical order).

Figure 1. Biogas Upgrading Suppliers

Water Scrubbing	PSA	Membrane Separation	Chemical Scrubbing	Cryo
• Chaumeca • Durr • Greenlane • Malmberg	• Air Liquide • ARI • BIOFerm • Carbotech • ETW • FirmGreen • Gas RNG Systems • Greenlane • Guild Associates • IVYS Adsorption ** • Mahler AGS • NeoZeo • Parker Hannifin • Sysadvance • Unison Solutions	• AB Energy • AgriKomp • Air Liquide • Arol Energy • Axiom • Bimeo Solutions • Bright Renewables • DMT • Energy Innovations • EnviTec Biogas • Galileo Technologies • Gas RNG Systems • Gazpack • GENERON • Granite Engineering • Greenlane • Hitachi Zosen INOVA • Honeywell • Parker Hannifin • Pentair • Prodeval • PyroGreen Gas • Stark Tech • TPI • Unconventional Gas Solutions (UGS) • Unison Solutions • Veolia • Weltec Biopower • Zenviro Tech ***	• Ammongas • Bilfinger • Carbonoro • GM Green Methane • Greenmac * • Hitachi Zosen INOVA • Honeywell • Morrow Renewables • Schwelm • Wartsila	• CryoPur • FirmGreen • Gas RNG Systems • Pietro Fiorentini • Waga Energy

*As of 2021, Greenmac is part of Bright Renewables

** As of 2023, Xebec has become IVYS Adsorption

*** Zenviro Tech broke off from Eisenmann, who is no longer in the upgrading business

Upgrading Market

It is important to note that due to limits in data acquisition, incomplete public information and some private data, the study may analyze fewer projects than are actually in operation in Europe and the North America. BiogasWorld conservatively estimates that only [REDACTED] of existing plants are analyzed in this section. To have a full picture of the European market, BiogasWorld suggests additional market study.

The current competitive analysis is based on information on more than 1 [REDACTED] upgrading units:

Figure 2. Biogas Upgrading Technology Suppliers by Number of Operational Units



The graphs below represent the technology share based on the number of operational units (Figure 2) and installed capacity (Figure 3).

Figure 3. Share of Analyzed Upgrading Technology Suppliers, Based on Number of Units

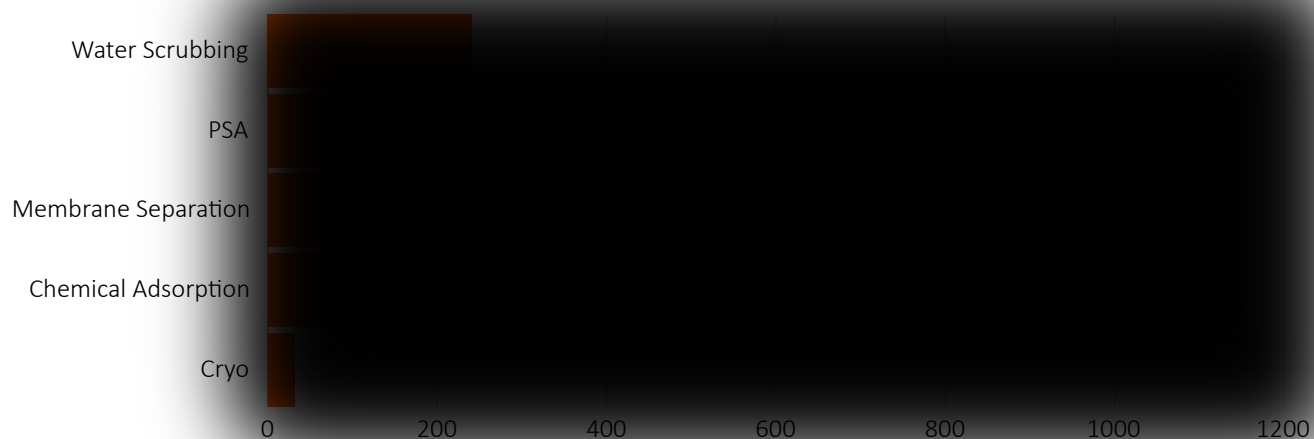
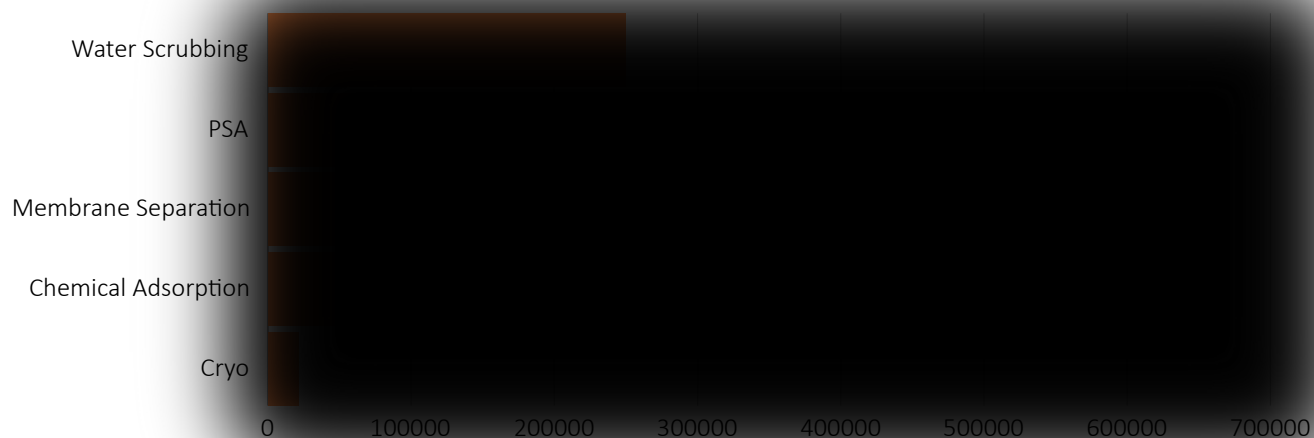


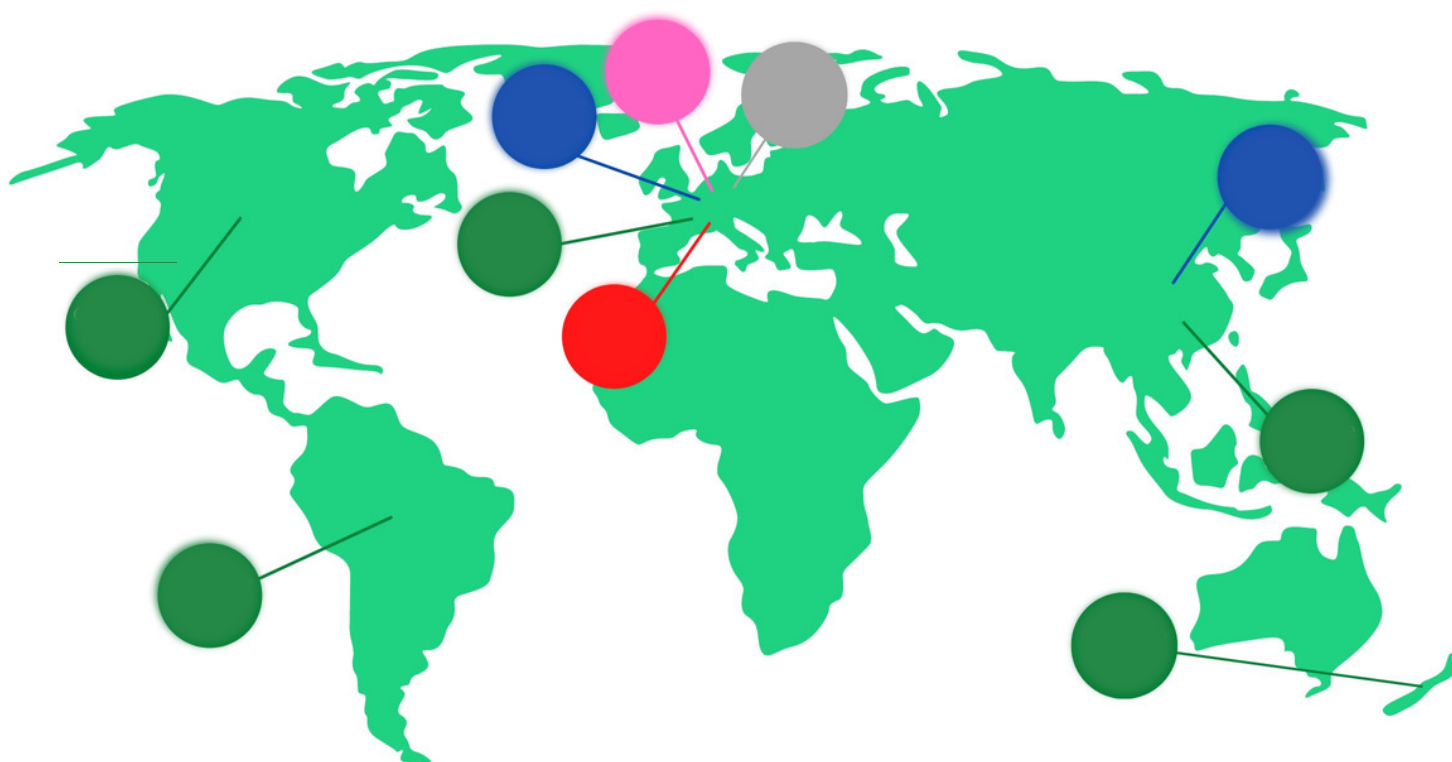
Figure 4. Share of Analyzed Upgrading Technology Suppliers, Based on Installed Capacity (m3/hr)



Major Suppliers - Water Scrubbing

Water Scrubbing

Figure 5. Presence of Water Scrubbing Suppliers, Installed Capacity of Units in Operation, m³/hr



PSA

Figure 6. Presence of PSA Suppliers, Installed Capacity of Units in Operation, m3/hr



Membrane Separation

Major Suppliers - Membrane Separation

COMPANY	Number of plants under construction	Capacity, under construction, m3/hr	Installed capacity, m3/hr	Number of plants under construction	Capacity, under construction, m3/hr
ADM Energy	10	18,800	10,000	10	18,800
ADM Energy	1	1,155	1,155	1	1,155
ADM Energy	1	N/A	N/A	1	N/A
ADM Energy	1	6,180	6,180	1	6,180
ADM Energy	1	N/A	N/A	1	N/A
BioEnergy	1	16,410	16,410	1	16,410
Clarus	1	N/A	N/A	1	N/A
Clarus	1	11,811	11,811	1	11,811
Energy Infrastructure	1	N/A	N/A	1	N/A
Energy Infrastructure	1	N/A	N/A	1	N/A
GALCO Technology	1	N/A	N/A	1	N/A
GALCO Technology	1	4,013	4,013	1	4,013
GALCO Technology	1	N/A	N/A	1	N/A
GRANITE Technology	1	N/A	N/A	1	N/A
GREEN Energy	1	8,300	8,300	1	8,300
GREEN Energy	1	N/A	N/A	1	N/A
HONEYWELL	1	N/A	N/A	1	N/A
HONEYWELL	1	N/A	N/A	1	N/A
PERMATEX	1	N/A	N/A	1	N/A
PERMATEX	1	1,600	1,600	1	1,600
PERMATEX	1	N/A	N/A	1	N/A
PERMATEX	1	11,500	11,500	1	11,500
UNION PROCESS	1	N/A	N/A	1	N/A
VEDOL Technology	1	N/A	N/A	1	N/A
WILLIS TOWERS	1	N/A	N/A	1	N/A

Membrane Separation

Figure 7. Presence of Membrane Separation Suppliers, Installed Capacity of Units in Operation, m3/hr



Chemical Scrubbing

Major Suppliers - Chemical Scrubbing

Company	Location	Capacity, under construction, MMscf/hr
ADAMSON GAS	USA	2,000
ADRIAN	USA	1,000
BRIGHT ENERGY	USA	N/A
CHRYSLER	USA	1,000
ENX	USA	N/A
GM	USA	1,000
HE	USA	N/A
HOV	USA	1,000
HOV	USA	N/A
STAN	USA	N/A
WASTELAND	USA	N/A
WASTELAND	USA	N/A

Chemical Scrubbing

Figure 8. Presence of Chemical Scrubbing Suppliers, Installed Capacity of Units in Operation, m3/hr



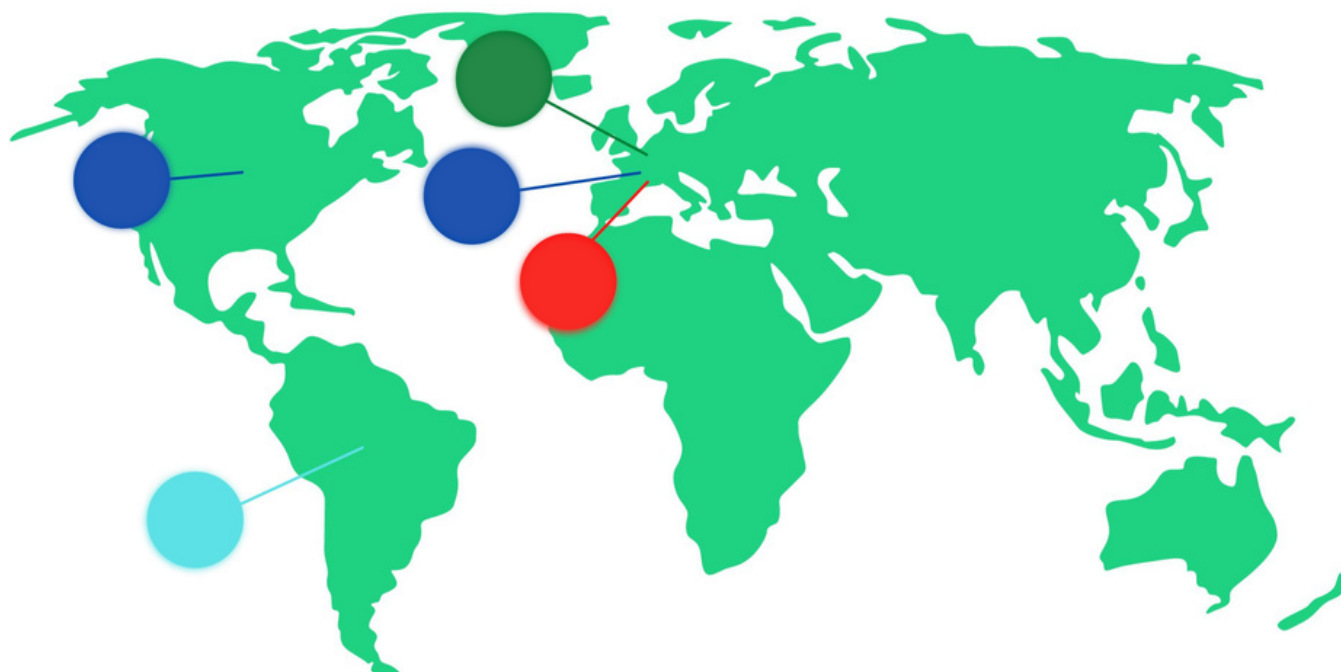
Cryo

Major Suppliers - Cryo

COMPANY	Number of plants in operation	Capacity, plants in operation, m3/hr	Installed capacity during last 3 years (2020-2022), m3/hr	Number of plants under construction (2023-2024)	Capacity, under construction, m3/hr
CRYO PUR	8	3,684	3,384	N/A	N/A
CRYO GREEN	1	2,000	N/A	N/A	N/A

Cryo

Figure 8. Presence of Cryo Suppliers, Installed Capacity of Units in Operation, m3/hr



Conclusion

The upgrading market has experienced significant year-over-year growth in 2023, with over hundreds of new units scheduled to come online within the next few years.

- The most popular technology for upgrading remains [REDACTED] due to its lower CAPEX and versatility.
 - Major suppliers for membrane separation technology include [REDACTED]
- The second most popular technology is [REDACTED] due to their high efficiency and ability to separate impurities with ease.
 - Major suppliers for pressure-swing adsorption technology include [REDACTED]
- An emerging technology is cryogenic upgrading, which is the newest technology type and can provide notable benefits due to the extremely low temperatures it brings the gas to, including the ability to produce bio-LNG and pure liquid CO₂.
 - Major suppliers for cryogenic upgrading equipment include [REDACTED]

Questions? Contact us!

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