

Cascade H₂O

Water Wash

Upgrading of biogas from all types of feedstocks, with high tolerance to impurities.

Every feedstock type creates its own unique type of biogas. Biogas produced from municipal waste water is different from that produced at sugar mills, which is different again from that produced on farms or from food waste. Cascade H₂O is ideal for upgrading biogas from feedstocks requiring high tolerance to impurities.

Cascade H₂O important benefits

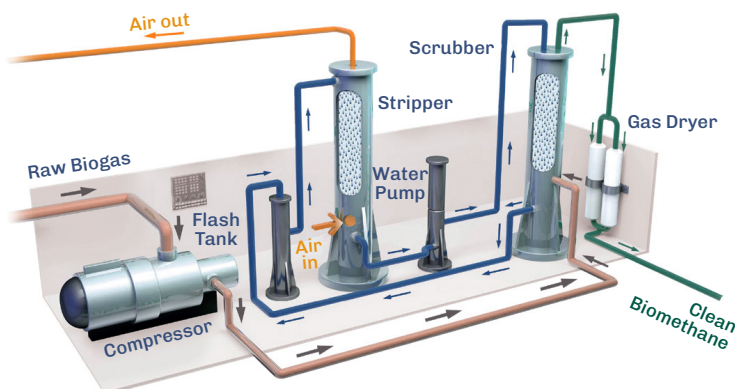
- **The most robust upgrading technology:**
In the even of pre-treatment breakthrough, will not be permanently damaged by high levels of impurities, such as hydrogen sulfide, volatile organic compounds, siloxanes, and oil.
- **Complies with pipeline requirements for RNG:**
Tackles tough biogas compositions that, in addition to carbon dioxide, include hydrogen sulfide, volatile organic compounds and siloxanes to create RNG meeting stringent requirements.



Cascade H₂O installation

Types of Feedstock:

Food Waste, Green Waste, Wastewater, Ethanol-By-Products, Agricultural Waste, Landfills, Sugar Mill



How Cascade H₂O works

1. biogas is compressed before flowing up through a water scrubbing tower
2. carbon dioxide, hydrogen sulfide, siloxanes, and volatile organic compound molecules are absorbed by the water while the methane passes through
3. product gas is dried before end use
4. water is recycled in a closed loop which absorbs the carbon dioxide and contaminants from the biogas then desorbs in the air exhaust stream



Why water wash technology for biogas upgrading?

Water wash technology is the most deployed biogas upgrading technology in the world. Water wash systems use counter-flow water to scrub away biogas impurities, without the need for chemicals or heat.

Greenlane Cascade H₂O biogas upgrading products:

- remove high levels of hydrogen sulfide, volatile organic compounds, and siloxanes to meet pipeline specifications, without the need for pretreatment
- operate in a closed loop to limit energy consumption
- provide high methane recovery with high uptime
- have no expensive overhaul of the upgrading media – it's only water
- are robust – will not be damaged by impurities
- is highly efficient carbon dioxide removal
- is the most cost effective solution to clean high flow of biogas

Cascade H₂O model range

Model	Max Flow (Nm ³ /h)*	Max Flow (scfm)*
Rimu	800	500
Matai	1200	750
Totara	2000	1250
Totara+	2500	1550
Kauri	5000	3100

*Minimum flow is 40% of max flow

Typical gas processing capability for RNG

Parameter	Raw Gas Quality	Product Gas Quality	Cascade H ₂ O
Methane (CH ₄)	45-60 %	Meets Pipeline Quality Requirements	Up to 99% methane recovery
Carbon Dioxide (CO ₂)	35-45 %		
Nitrogen (N ₂)	0~1 %		
Oxygen (O ₂)	0~0.1 %		
Hydrogen Sulfide (H ₂ S)	up to 10,000 ppmv*		

*Contact us for higher H₂S level

The Greenlane Advantage

Solving the industry's most challenging problems for over 35 years with more than 355 systems supplied into 28 countries.

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|----------------------------------------------------|------------------------------------------------------|
| + 24/7/365 expert technical support | + Proprietary software and equipment upgrades |
| + Remote monitoring and management | + Commissioning, training & performance optimization |
| + Priority spare parts incl. warehousing/logistics | + Service contract options |

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