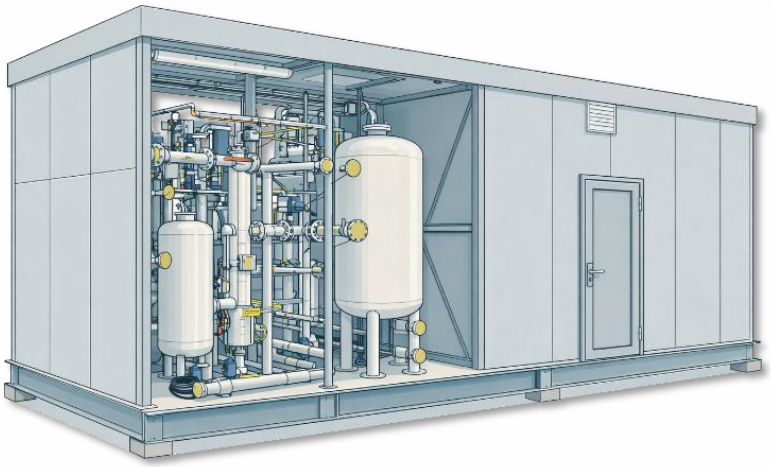
Biogas Upgrading & CO_2 Recovery

Modular Shelter Skid – Reference

The process: biogas upgrading and CO_2 recovery:

Biogas from anaerobic digestion is essentially a mixture of **methane and carbon dioxide**. **Upgrading separates the two**: the biogas is purified into biomethane (Renewable Natural Gas) by **removing the CO_2**, giving a gas fully equivalent to natural gas for grid injection or vehicle fuel, while **the CO_2** – historically vented – **is recovered and liquefied** to food- and industrial-grade quality. What used to be a waste stream becomes a valuable by-product for the food & beverage, greenhouse and industrial markets, improving both the **sustainability** and the **economics** of the plant.
Over the years, **Monteco** has built numerous skids for Biogas upgrading and CO_2 recovery. These systems are often **manufactured as complete units and transported to site**. One of the most common solutions is the use of **modified ISO containers**, but that's not all...



A different approach: an engineered shelter, not a container

For Biogas upgrading and CO_2 recovery plants and their electrical systems, **Monteco has manufactured an alternative to standard ISO containers**: modular structures whose panels and purpose-designed steel frame are built and assembled around the plant. This ensures **full customisation**, greater usable volume, easier access during both manufacture and maintenance, and a unit that is fully transportable to site.

The solution naturally accommodates two separate areas:

- a **process section**, housing the vessels, pipework, valves and instrumentation, suitably ventilated and managed as a potentially classified area;
- a **protected electrical room**, with its own ventilation and access, keeping switchboards, control panels and the electrical system safely isolated from the process environment.

This separation **improves safety and area-classification management**, simplifies certification, and lets the two sections be built, tested and maintained independently.

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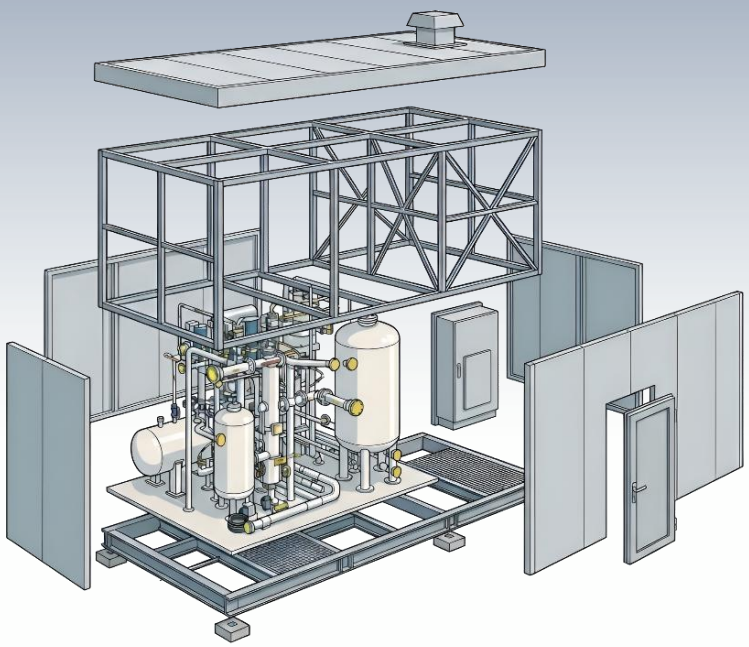
Beyond mechanical fabrication, **Monteco** covers the full constructive engineering and structural design of the shelter and skid:

- ❑ Plant and skid layout, detailed mechanical design of the process package;
- ❑ Structural design of the steel frame, base and panel system;
- ❑ Structural verification by FEM analysis of the frame under transport, lifting and operating loads;
- ❑ Foundation loads and lifting-load calculations;
- ❑ Piping design and, where applicable, PED declaration and piping stress analysis;
- ❑ Integration and protection of the electrical room;
- ❑ Mechanical fabrication, assembly, FAT and packaging for shipping.



Exploded view:
roof with ventilation, braced steel frame, removable panels, process skid, electrical cabinet and base frame.