Med Clean Propre Limpio Mediterraneum

UNEP MAP PAM

GRECO INITIATIVE GREEN COMPETITIVENESS

Regional Activity Centre for Cleaner Production

GOBIERNO DE ESPAÑA · MINISTERIO DE MEDIO AMBIENTE Y MEDIO RURAL Y MARINO

Generalitat de Catalunya
Government of Catalonia
Department of the Environment and Housing

No. 109 Examples of waste and emission minimisation iniciatives

Biogas enrichment to be used as biofuel for vehicles

Company	AMASA S.A. (Group Hera)
Industrial sector	Environmental services
Environmental considerations	Methane is 34 times more harmful as a greenhouse gas than CO2. There are many different places where methane is generated as landfills, animal farms and in general in every place where there are organic decomposition. Some systems try to use it as an energy source burning it to produce electricity. But this procedure has some different problems and it is needed to look for more efficient ways to use it.
Background	Biogas is suitable to be used for different purposes as fuel for boilers, engines, etc. That means, any application done by Natural Gas. Another interesting way of Biogas Natural is its purpose as fuel for vehicles. In the HERA Group's Coll Cardús resource centre (Barcelona), is operative from December 2005 the first biogas concentration and compression plant of Spain, using the biogas to move his own fleet of cars. The plants are designed according to the needs of each project, depending on the flow and characteristics of the raw biogas.
Summary of actions	The process consists on removing all the harmful elements that might damage the equipment that use biogas as bio fuel. In addition, by removing the CO2 it is possible to obtain a methane concentration up to 97%, with the same characteristics of natural gas, ready to be used as bio fuel or directly injected in the natural gas grid. HERA-AMASA's biogas upgrading technology consists on a chemical absorption as it has high competitive advantages as it works at atmospheric pressure, which means both a low consumption of electric power and a silent, simple and safe operation.

Photographs of the installation

Biogas upgrading plant

Compression equipment (left) and refuelling station (right)

Biogas Natural vehicle

Some economical information

The plant general investment depends on the concentration of generated Methane, the quantity of it and the size of the source (that gives the operational years of the containerized plant) The operational cost depends on the vehicles fleet, that must to feed and also the type of vehicles.

Investment (€)

Containerized Installation (BNCC)	750.000
Compressor 50-75Nm3/h	
Stock 28 Nm3	250.000
Petrol pump	
Boiler	40.000
	1.040.000

Operation & maintenance (€)

Personnel	40.000	€/year
Maintenance BNCC	50.400	€/year
Maintenance compression unit	16.650	€/year

Economical study for 75 small vehicles

years	0	1	2	3	4	5
Fuel savings	666.317	666.317	666.317	666.317	666.317	666.317
Investments	1.502.000					
O&M	107.050	107.050	107.050	107.050	107.050	107.050
Consume	101.912	101.912	101.912	101.912	101.912	101.912
Payback	42%					

Conclusions

The biogas upgrading plant developed by AMASA is fully containerized, which allows an easy and fast installation and startup.

By this way the methane emissions to the atmosphere reduces in a considerable degree that helps to tackle the greenhouse effect.

This kind of installation helps to control the fuel costs in own fleet vehicles.

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