



BIOGAS AND SYNGAS BURNERS





In the last few years the world we were used to know has dramatically changed. New forces are shaping a different scenario in which we need to take new and different decisions than the past. The pressure on climate change and the general trend towards the achievement of energy independence have unlocked new possibilities for companies on energy management. In this scenario Baltur has developed a burner technology to allow companies to transform gas from waste into a valuable energy source.



The biggest challenge of our times is the climate change, which represent first a threat to our habits and lifestyle.

Confronting with a change indeed is never easy, people feel insecurity and anxiety in facing the unknown: it's a challenge to ourselves and to our beliefs.

Only those who will accept the challenge can embrace success





Do you have a source of biogas or syngas?

The terms **biogas** and **syngas** are referred to the products of different processes with different input elements, as a result the chemical composition of gases is also different.

Biogas is a natural fuel that is obtained through anaerobic digestion, i.e. bacterial fermentation of organic residues from animals or plants origin such as agricultural or urban waste, sewage, green and food waste that takes place in the absence of oxygen.

Syngas or synthesis gas is a mixture composed of carbon monoxide (CO) and hydrogen (H₂) with the presence, in modest quantities, of methane (CH₄) and carbon dioxide is generally produced through a **steam reforming** process starting from coal gasification. Other alternative processes are also available that use biomass as raw materials.

Both biogas and syngas are characterized by **low content of CH₄** and **high content of CO₂** instead, which lead to very low calorific power. In addition, depending on the process, the content of chemical species present is not constant and may change according to raw materials composition. As consequence usage of these gases for combustion may be very difficult due to low and instable calorific power.

Composition of the gases may vary a lot, a general but not exhaustive indication is reported on table below:

SUBSTANCE	BIOGAS COMPOSITION	SYNGAS COMPOSITION
H ₂	<1%	20-40%
CO	<1%	35-40%
CO ₂	25-60%	25-35%
CH ₄	40-70%	0-20%
N ₂	<2%	2-5%
H ₂ O	<2%	-
H ₂ S	<1%	-
O ₂	<1%	-

Is Biogas/Syngas production too volatile for industrial process?

Biogas and syngas can be a very valuable resource but still present some limitations for industrial applications. Stationary applications for heat and power generation need:

- Constant fuel flow and stable pressure power supply
- Constant and predictable performances of burners and of heat generator

The variable composition of biogas and syngas along with the unstable availability of gas flow introduce some critical elements in the development of applications in industrial field.

Baltur has developed a burner technology able to overcome these issues and enable a safe and reliable implementation on such applications.





A solution for every application

The solutions developed by Baltur branch off in three directions:

- 1 BIOGAS AS UNIQUE ENERGY SOURCE**
The burner uses a single gas
- 2 BIOGAS AND NATURAL GAS AS ALTERNATED ENERGY SOURCES**
The burner uses two gases in alternated mode switching automatically or manually from one to another
- 3 BIOGAS/SYNGAS AND NATURAL GAS AS COMBINATED ENERGY SOURCES**
The burner uses two gases at the same time managing automatically variable gas/gas ratio.



Thanks to the design of the burner head Baltur's burners are capable to process biogas and syngas with calorific power as little as 3,4 kWh/Sm³ ensuring at same time stable performance.

Baltur burners can grant low NOx emissions both for natural gas and biogas/syngas as following:

FUEL	EMISSION LEVEL
Natural gas & Biogas	NOx < 100 mg/kWh *
Syngas	NOx < 200 mg/kWh *

Misured on three-pass steam generator

All the Baltur burner for biogas/syngas are **equipped with UV flame scanner** to ensure a constant and accurate flame control where traditional ionization probe may fail to have.

In addition, **Baltur's solutions can withstand H₂S content up to 1% ensuring long lasting system life.** This is especially important in case of application of biogas, where H₂S content may lead to untimely degradation of mechanical components due to generation of sulphuric acid when gas exhibits excessive humidity.

The solution can be also integrated with state-of-art technologies for achieving additional targets on safety, emission reduction or energy savings.

These are:

- > Integration of pilot flame (always present for syngas applications)
- > Integration of FGR to further reduce NOx emissions
- > Integration of O₂/CO control to grant additional fuel savings
- > Integration of VFD to ensure additional energy savings



Success stories

BALTUR PROJECT

TBG 1100ME-V O₂ FGR NATURAL GAS/BIOGAS

- ME ELECTRONIC MODULATION
- V INVERTER CONTROL
- O₂ O₂ CONTROL
- FGR FLUE GAS RECIRCULATION



THE APPLICATION

Revamping of the old plant including an additional fuel line coming from a brand new digester system feeded by agricultural waste collected from suppliers.

THE CHALLENGE

Maximize energy saving and operating costs considering floating availability of alternative fuel.

THE SOLUTION

Baltur proposed a mixing fuel burner capable to manage two different fuels in variable proportion at any thermal load. The system is designed to make use of all the biogas available and compensate the missing thermal power to reach duty point with natural gas. In addition to minimize energy consumption the machine has been equipped with VFD fan motor and O₂ sensor.

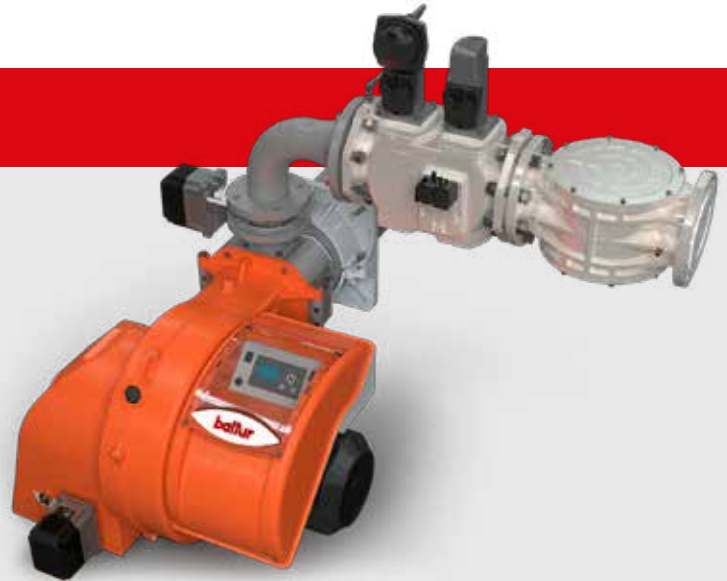
Field of Application	DISTILLERY
Installation	Three pass steam boiler
Firing rate	9100 kW @ 9 mbar
Functioning	Mixing fuel
Emissions natural gas fuel	< 100 mg/Nm ³
Emissions Mixing fuel	< 200 mg/Nm ³
Annual expected saving natural gas	52%
Annual expected saving electrical power	32%
Annual expected saving CO ₂ emissions	>250 tons
Annual expected cost saving	49%



BALTUR PROJECT

TBG 360ME BIOGAS

- ME ELECTRONIC MODULATION



THE APPLICATION

Brand new plant with single fuel line coming from stock of Biogas produced locally through digester system.

THE CHALLENGE

Ensure stable performances and long lasting solution given biogas H₂S content.

THE SOLUTION

Baltur proposed a single fuel burner capable to withstand content of H₂S up to 1% reducing dramatically the need for continuous maintenance.

Field of Application	FOOD & BEVERAGE
Installation	Three pass steam boiler
Firing rate	3000 kW @ 7,5 mbar
Functioning	100% Biogas
Emissions	< 200 mg/Nm ³
Annual expected saving natural gas	100%
Annual expected saving CO ₂ emissions	>230 ton

Boost your energy strategy today!

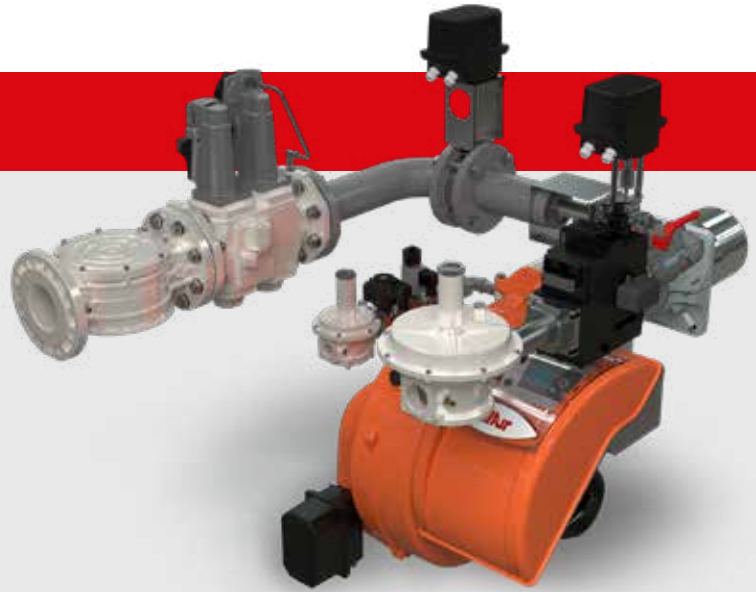
- > Are you the Energy Manager looking for a better energy balance?
- > Are you the Technical Manager looking for better and more robust solutions?
- > Are you the Entrepreneur looking for new opportunities?



BALTUR PROJECT

TBG 60ME NATURAL GAS/SYNGAS

- ME ELECTRONIC MODULATION



THE APPLICATION

Brand new plant with dual fuel capability for refrigeration system. The machine is feeded directly by oxidating reactor with an intermediate stock.

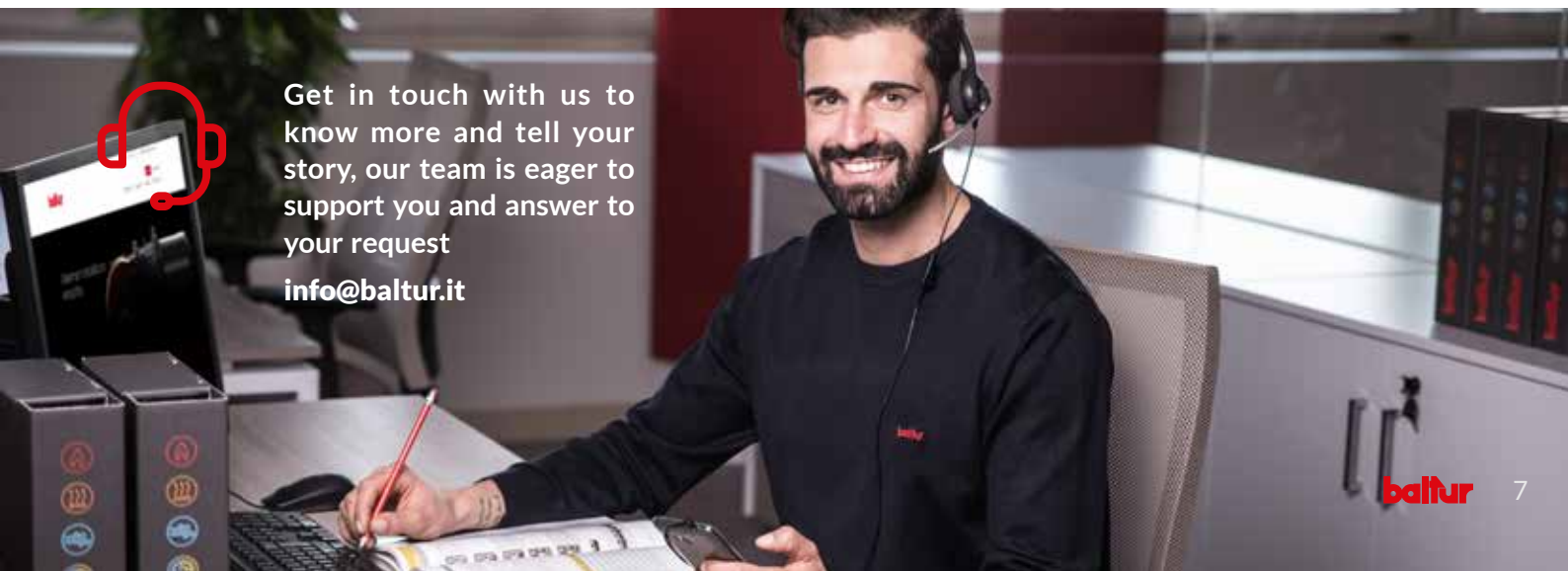
THE CHALLENGE

Ensure power continuity with fast and smooth transition from a fuel to the other one depending on availability.

THE SOLUTION

Baltur proposed a dual fuel burner capable to swith automatically from Syngas to Natural gas and viceversa depending on availability of preferred fuel (Syngas). The machine is also designed to be equipped with BUS connections for remote data monitoring.

Field of Application	FARMING
Firing rate	500 kW @ 3 mbar
Application	Hot water
Emissions natural gas fuel	< 100 mg/Nm ³
Annual expected saving natural gas	70%
Annual expected saving CO ₂ emissions	>40 tons



Get in touch with us to know more and tell your story, our team is eager to support you and answer to your request

info@baltur.it



baltur

Energy for People

Baltur S.p.A.

Via Ferrarese, 10 - 44042 Cento (FE) - Italy
Tel. +39 051 684.37.11 - info@baltur.it

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www.baltur.com

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