



SEBIGAS

Summary



WHO WE ARE



TECHNOLOGY



APPLICATIONS



SERVICES



WHY SEBIGAS



WHO WE ARE



Who we are

Who we are



SEBIGAS is a major Italian company active since 2009 and specialized in **designing, constructing and managing anaerobic digestion plants.**

With **many years' experience** in the **international** markets, we provide innovative and tailored technologies and solutions to contribute to the energy transition process and decarbonisation.

Who we are

Sebigas: company profile



RESEARCH



DEVELOPMENT



FLXIBLE
EXECUTION



TECHNOLOGICAL
EXPERTISE



FINANCIAL
SOLIDITY

SEBIGAS operates as an **EPC contractor** to project turnkey plants, provides technology and engineering in the role of **Technology Provider**, and is on the market as a **Partner** to support the project development and the authorization process.

With a portfolio of 84 plants installed, SEBIGAS plants guarantee **98.2% availability at maximum power**.



Who we are

Values

RESPONSIBILITY



QUALITY



COMMITTMENT



TEAMWORK



INNOVATION

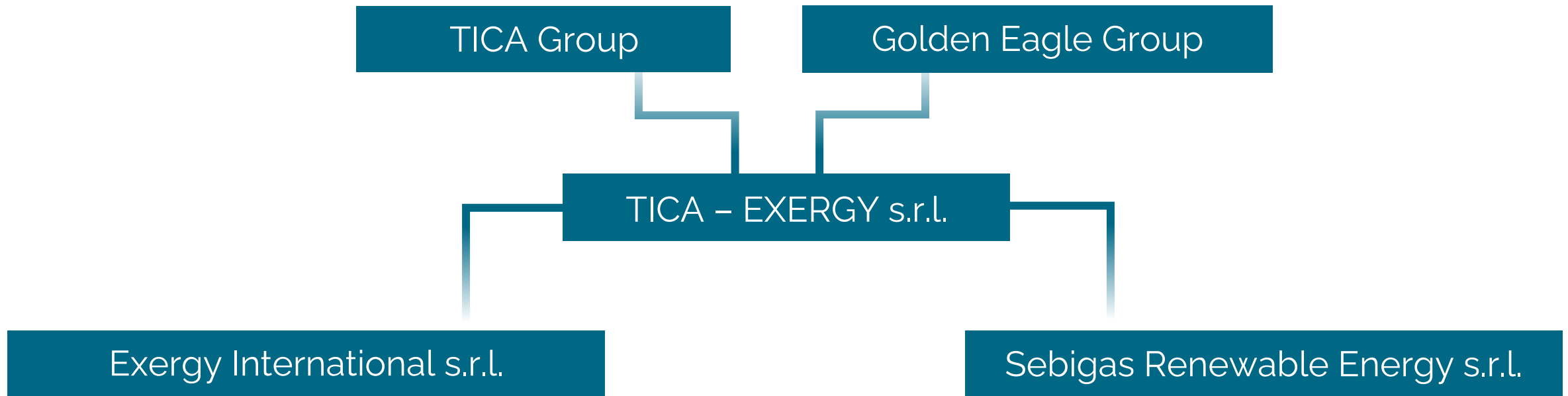


CUSTOMER FOCUS

Who we are

The Group

SEBIGAS is part of **Tica – Exergy**, holding controlled by TICA Group and Golden Eagle, solid and international industrial companies that chose to invest in the renewables market, for an increasingly market expansion.





**Active since 1991,
is a solid industrial company that provides
the International markets HVAC and
thermal utilization systems**

10

Manufacturing facilities

+4500

Employees worldwide

+70

Branch offices in the world



Who we are

Golden Eagle Group

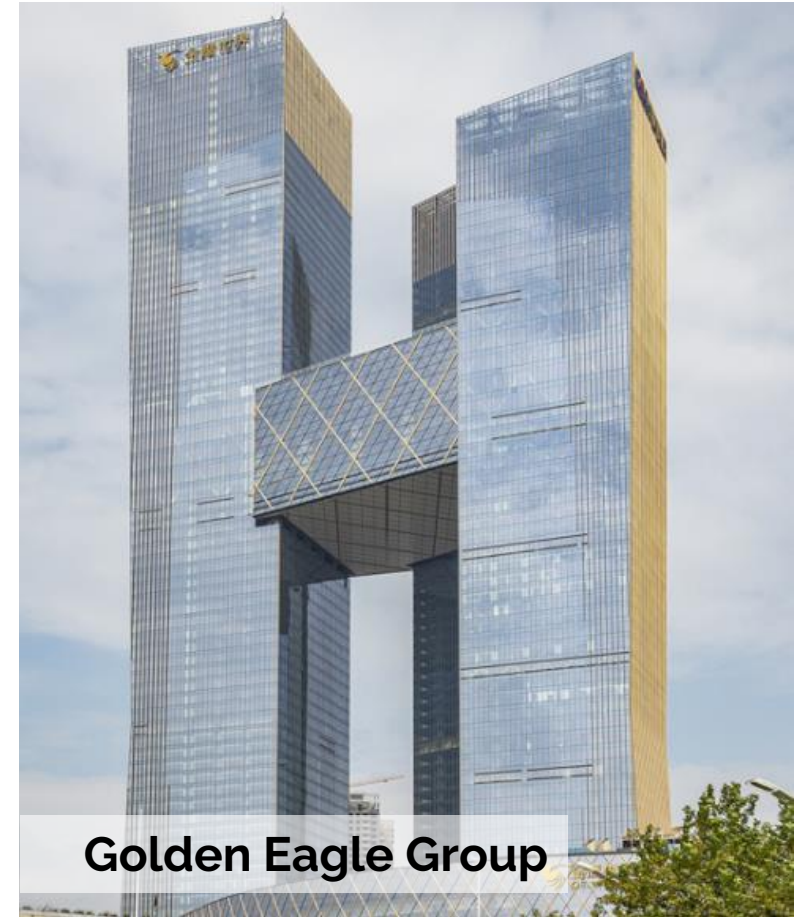
Technological expertise and financial solidity

The company's mission is "More than commitment to be the outstanding company in the industry in pursuing internationalized and sustainable business"

TOP investment holding company in the **Retail, Hospitality, Real Estate** sectors

15.0 M square metres of accumulated developed area

More than 40,000 jobs created



Golden Eagle Group

TECHNOLOGY



A sustainable solution

SEBIGAS is committed in providing solutions that contribute to the **energy transition process** and **make companies profitable and sustainable**.

The anaerobic digestion allows companies to transform waste and scrap materials into opportunity, value and occasion, in the interest of the community and the environment.

Why is it a sustainable solution?



producing energy from immediately accessible renewable sources



restoring nutrients to the soil



reducing the impact of CO₂ on energy and biofuels



creating value in locally-based circular systems



giving value to waste and scrap as an energy source



supporting the companies economic growth



producing good quality fertilisers and soil improvers

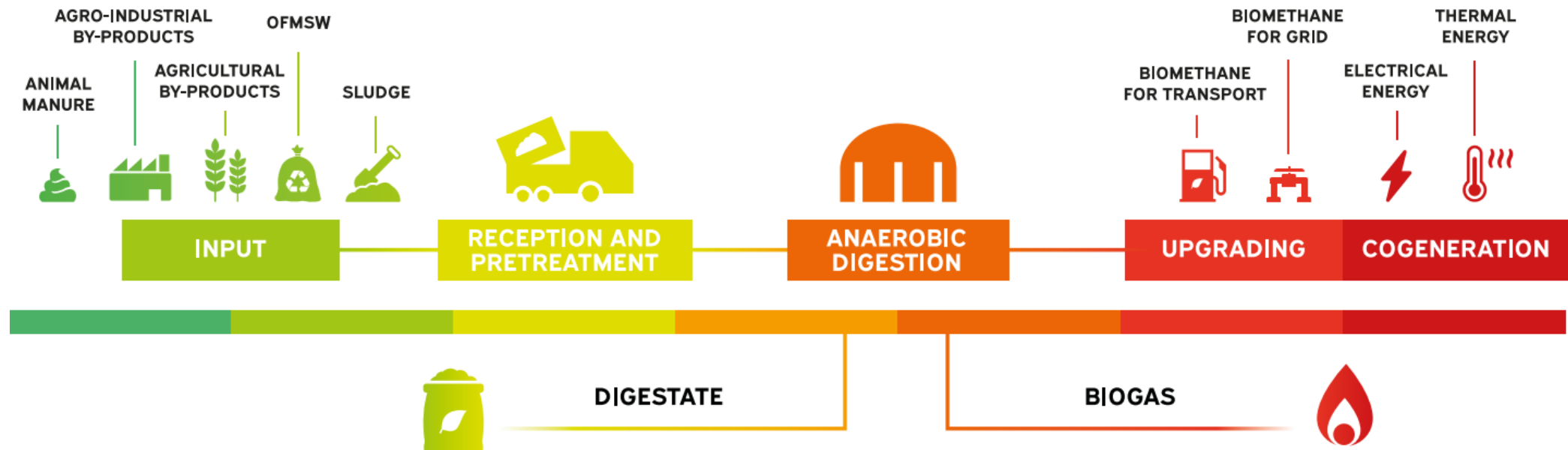


creating jobs in the sustainable supply chain

The anaerobic digestion

Sebigas know' how allow us to design plants choosing from different technologies. **The most suitable reactor for the customer is selected** according to the available biomasses and their characteristics:

- DRY MATTER AND ORGANIC MATTER CONTENT
- THERMAL REGIME
- RETENTION TIME
- MIXING SYSTEM



The plant feeding

SEBIGAS uses a combination of **expertise, research and flexibility** to create a tailor-made mass balance and treat in anaerobic digestion heterogeneous and complex biomasses.

With a portfolio of more than **70 biomasses** analyzed, SEBIGAS guarantees the full exploitation of every biomass used as a feeding.



CSTR

CSTR reactor is a technological solution that requires a **continuous flow of fresh biomass**. Fed into the reactor, the biomasses are constantly mixes to ensure a perfect homogenization.



DRY SUBSTANCE	5% < DS < 10%
THERMAL REGIME	Mesophilic or thermophilic
RETENTION TIME	20 < days < 60
MIXING SYSTEM	Mechanical (slow and fast mixers), inside the rector

Advantages:

-  Is suitable for feeding the plant with biomass with a complex digestion
-  Provides the possibility to implement co-digestion with a varied recipe
-  Has a high buffering capacity for ph variation

anMBBR

anMBBR reactor is adapt for the **treatment of industrial wastewater** in anaerobic digestion. It enables an on site management of high volumes of effluents. It can also be implemented on new or existing production lines.



DRY SUBSTANCE	DS < 1%
THERMAL REGIME	Psychrophilic or mesophilic
RETENTION TIME	< 10 days
MIXING SYSTEM	Mechanical (slow mixers) inside the reactor - gasmixing

Advantages:



It has low digestion volumes



It is characterised by low energy costs for the mixing sysyem



Provides flexibility in the organic load management

CLR

The CLR (Covered Lagoon Reactor) is a technology that enables the anaerobic digestion of **high volumes of liquid wastewater**. The reactor is a tank called «lagoon» and provided with a gasometric lagoon



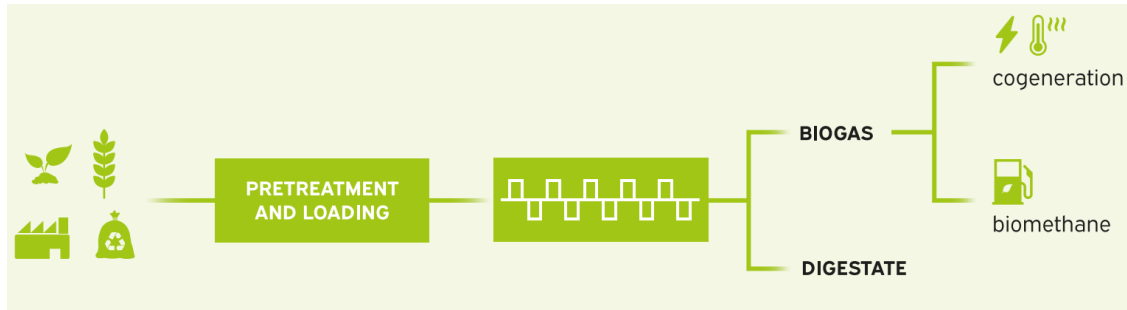
DRY SUBSTANCE	DS < 5% and low fibre content
THERMAL REGIME	Psychrophilic or mesophilic
RETENTION TIME	15 < days < 25
MIXING SYSTEM	Hydraulic mixing (recirculation pumps)-gasmixing

Advantages:

-  Enables on-site management of high stream effluents
-  Has a high buffering capacity in the management of acid biomass in monodigestion
-  Ensures low energy costs for the mixing system
-  Ensures flexibility in the management of seasonal biomasses

PFR

The PFR (Plug-Flow Reactor) is suitable for the treatment of **biomass with a high dry matter content**. It is equipped with paddles or screws to move the biomasses through the reactor.



DRY SUBSTANCE	15% < DS < 35%
THERMAL REGIME	Mesophilic or thermophilic
RETENTION TIME	20 < days < 60
MIXING SYSTEM	Mechanical (slow mixers) inside the reactor

Advantages:

-  It is suitable for biomasses with complex digestion
-  It is suitable for reduces digestion volumes and high fibrous biomasses
-  Ensures the reduction of the quantities of digestate
-  Sequentially separates the stages of the anaerobic digestion within the reactor, thus having greater control of each of them

APPLICATIONS



Applications

Agricultural plants



Agricultural plants

Agricultural biogas plants are a solution to valorize biomasses from agriculture, livestock and agro-industry.

It is a sustainable investment, that guarantees a supplementary and constant source of income.



AGRICULTURAL BY PRODUCTS

fruit and vegetable waste, straw, leaves and cobs...



ENERGY CROPS

sorghum, triticale, corn, second harvest...



ANIMAL MANURE

from cows, pigs, sheep, poultry, horses...

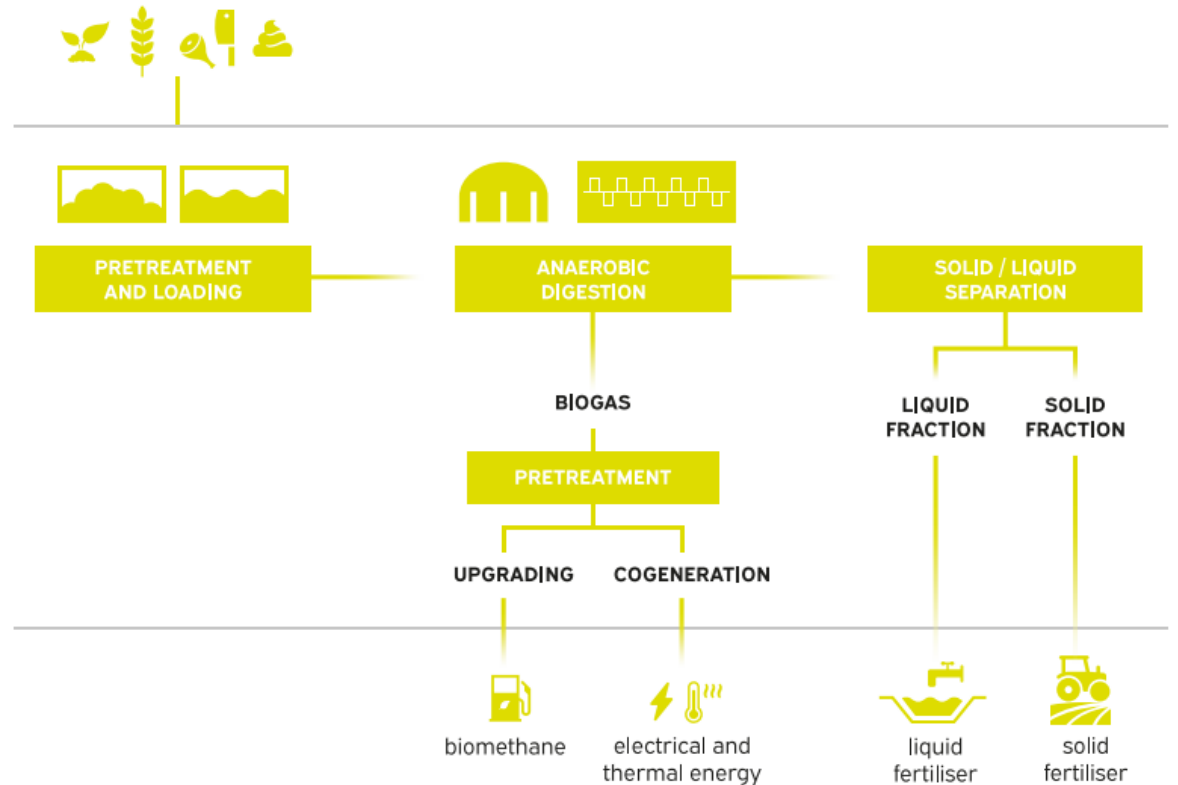


AGROINDUSTRIAL BY-PRODUCTS

slaughterhouse waste, dairy production, alcoholic beverages, soft drinks, sugar mills, paper mills, roasting, ethanol, oil, rice...

Agricultural plants

- They support the company's effluents management
- The company replaces synthetic products with organic ones
- The energy production is a continuous source of income
- The plant creates a profitable and circular production system, while creating synergies with the surrounding communities



Applications

Organic waste plants



Organic waste plants

Installing a biogas or biomethane plant fed with the OFMSW represents a sustainable investment for the complete and circular recovery of huge amount of waste from households or channels such as retail organizations or Ho.Re.Ca



OFMSW

From door to door collection



NON-DOMESTIC FOOD WASTE

From hotels, restaurants, catering companies, bars and cafés (Ho.Re.Ca)

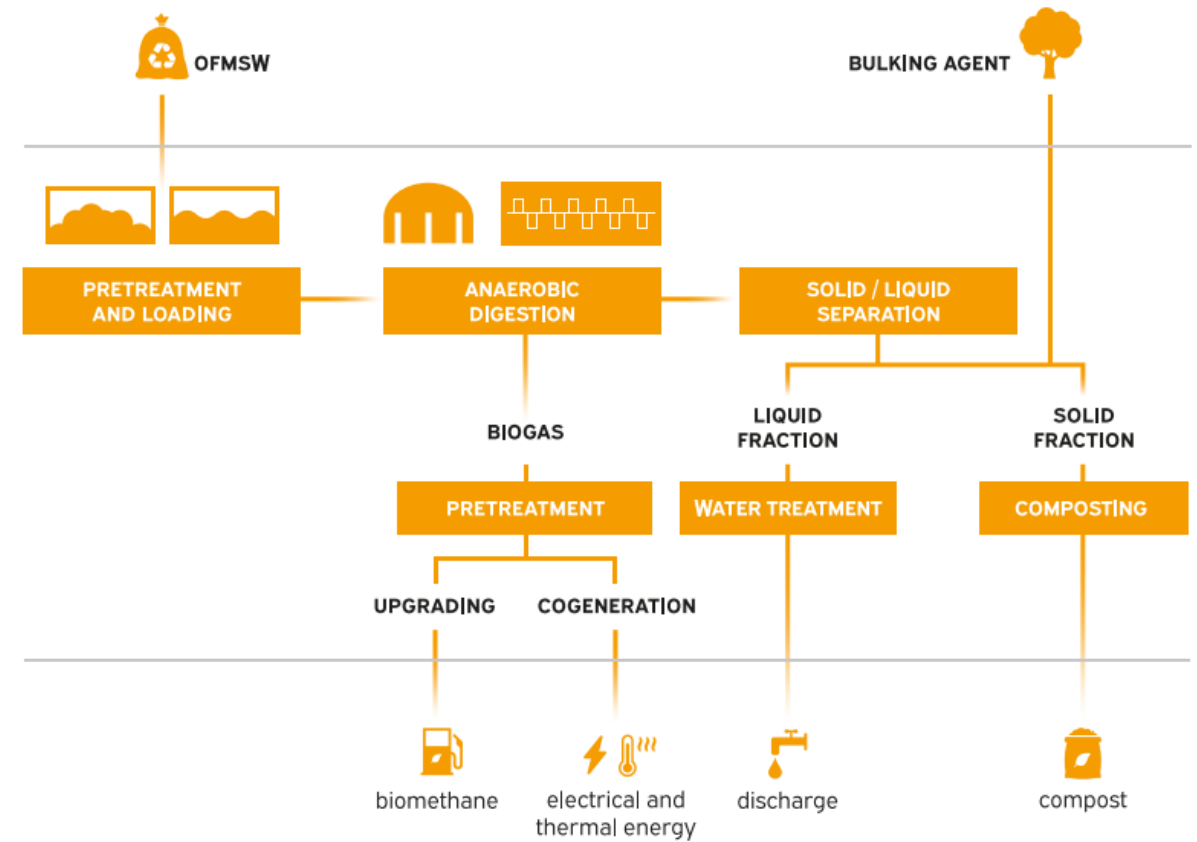


EXPIRED AND NON-COMPLIANT FOOD

From large-scale retailers and distributors

Organic waste plants

- Recovery of waste, alternatively dispatched to landfill or incineration
- The liquid fraction of digestate may be discharged into surface water bodies
- The solid fraction can be used as a composted soil conditioner
- Energy production is a constant supplementary source of income
- Reduce energy supply cost from the grid



Applications

Industrial plants



Industrial plants

The industrial production sector is one of the most energy-intensive, which would great benefit from the implementation of technology to support the circular economy and reuse of energy.



DAIRIES



BREWERIES, DISTILLERIES AND SOFT DRINKS PRODUCERS



SUGAR FACTORIES



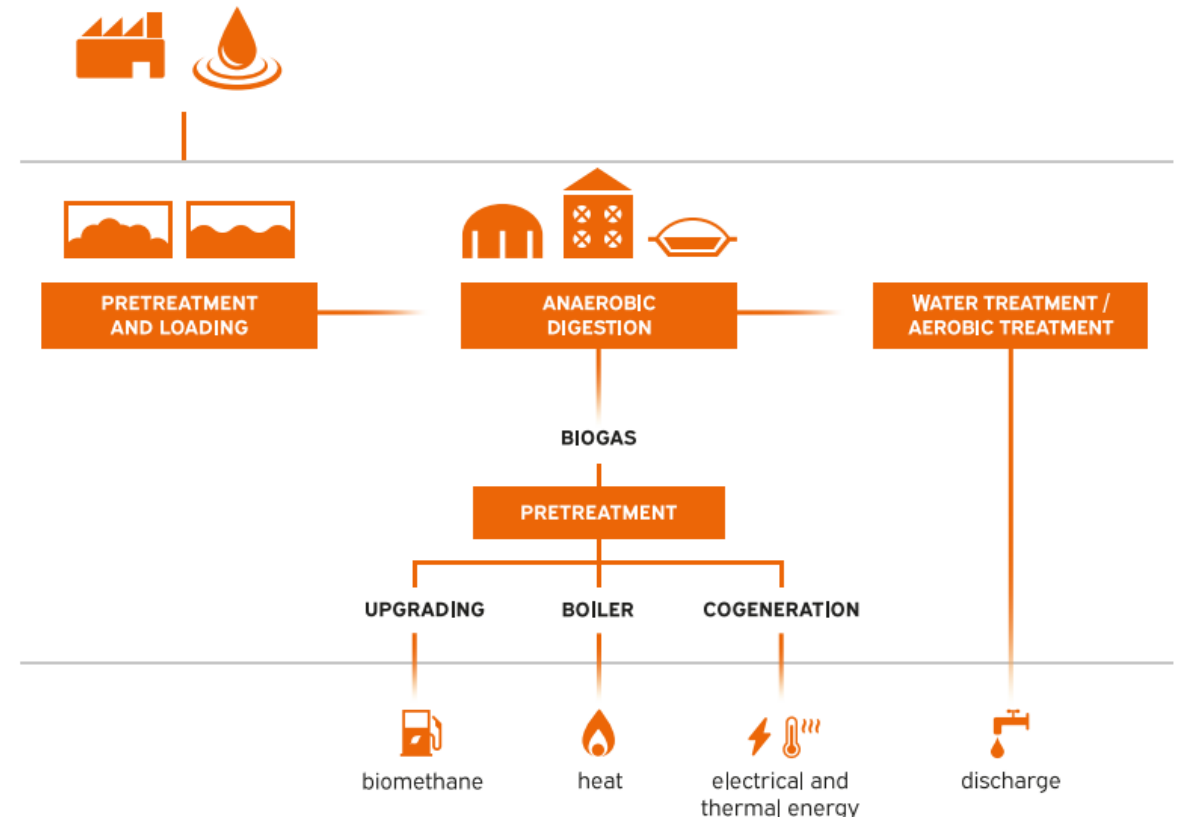
PAPER MILLS



SLAUGHTERHOUSES

Industrial plants

- They allow the recovery of high volumes of produced wastewater, often dispatched to disposal
- Being the production processes energy-intensive, the biogas plant is a source of considerable savings
- They produce energy, to be reused in company production processes



Applications

Sludge plants



Sludge plants

Public and private companies are increasingly committed to adopting sustainable solutions for the treatment of sludge produced at the civil and industrial level. By treating sludges in anaerobic digestion, it is possible to recover and valorize them.



INDUSTRIAL SLUDGE

Meat, fish and dairy processing companies, soft drink companies, breweries, confectionery companies, paper mills, the textile industry...

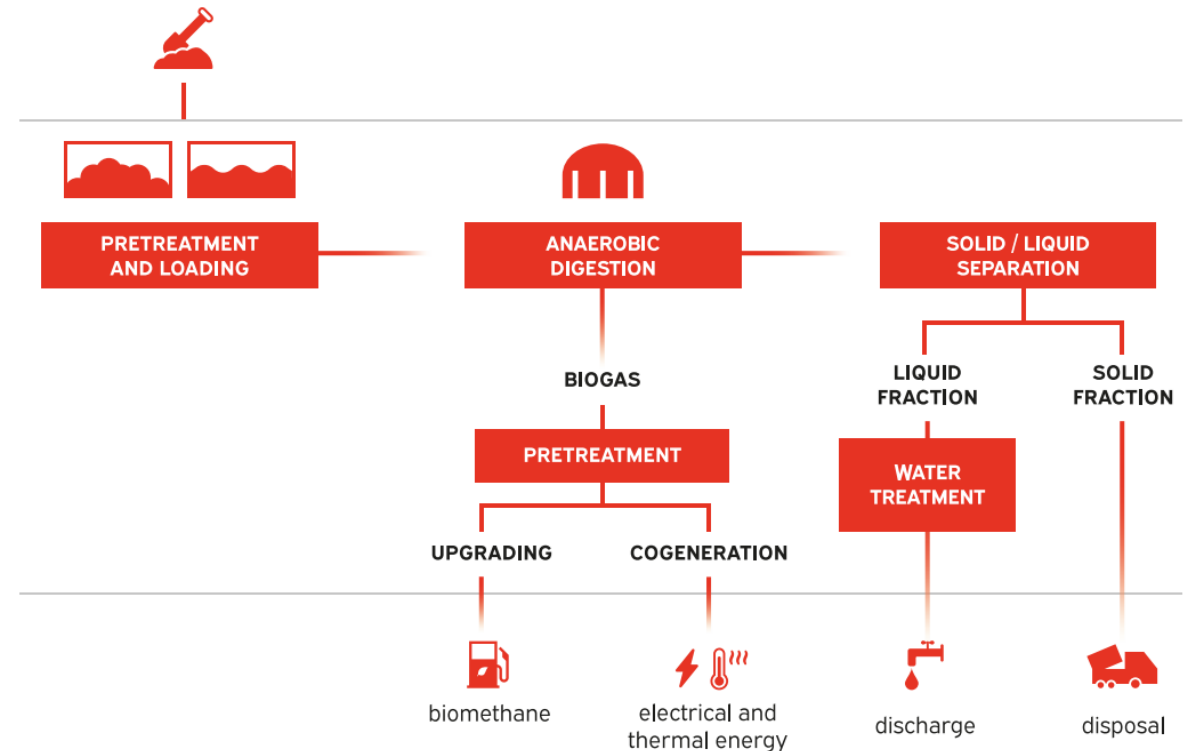


MUNICIPAL SLUDGE

Sludge from sewage treatment and urban wastewater treatment plants

Sludge plants

- Self-consumption reduces greenhouse gas emissions from the process and reduces energy dependence on fossil fuels
- Reduces bacterial load in the sludge and the sludge volumes for disposal
- Turns waste into a source of income or tool to reduce operating costs



SERVICES



Project development



CO-DEVELOPMENT

Possibility to develop joint projects



FEASIBILITY STUDY AND FINANCIAL ANALYSIS

SEBIGAS realises **feasibility studies** to assist the customer in **evaluating the investment** from a technical, environmental and economic perspective



BUSINESS PLANNING

Drawing up an accurate **business plan** allows a detailed analysis of the return on investment of each project



AUTHORIZATION SUPPORT

SEBIGAS provides consultancy services to support the plant **authorisation phases**, from the environmental impact assessment to the grid connection



Engineering and Construction



EPC - ENGINEERING PROCUREMENT CONSTRUCTION

SEBIGAS offers an **EPC** service for turnkey delivery of the project



TECHNOLOGY PROVIDER

SEBIGAS supports customers and partners **supplying technology and engineering** documents



REVAMPING E REPOWERING IMPIANTI ESISTENTI

SEBIGAS offers services to revamp or repower existing plants, to maximize their **cogeneration** power or to install an **upgrading** system for biomethane production

O & M and automation service



AUTOMATION SERVICE

Thanks to a **proprietary software** with which the plant is equipped, SEBIGAS guarantees appropriate assistance both at the plant itself and online



OPERATORS TRAINING

In case the client decides to manage the plant independently, SEBIGAS can provide a **plant management training** to cover both the technical and biological aspects



PLANT OPERATION

SEBIGAS provides complete plant management for a direct and timely maintenance

Biological consultancy



LABORATORY ANALYSIS

SEBIGAS offers **biological analysis** to monitor the well-being of the anaerobic environment and the continuous biogas production. Within the services offered, BMP test, theoretical biomethane yields and continuous testing



BIOLOGICAL ASSISTANCE

SEBIGAS offers full biological assistance and chek-ups, verifying the soundness of the materials storage, adapting the feeding recipes, and monitoring the digestion and mixing processes



REMOTE DATA COLLECTION AND ANALYSIS

Plants are **monitored remotely** for an efficient management, and to control the plant operating costs for revenue generation



ON SITE VISITS

On-site visits allow SEIBGAS to **take samples** for FOS-TAC, PH and temperature analysis

WHY CHOOSE
SEBIGAS





EFFICIENT

TAILORED

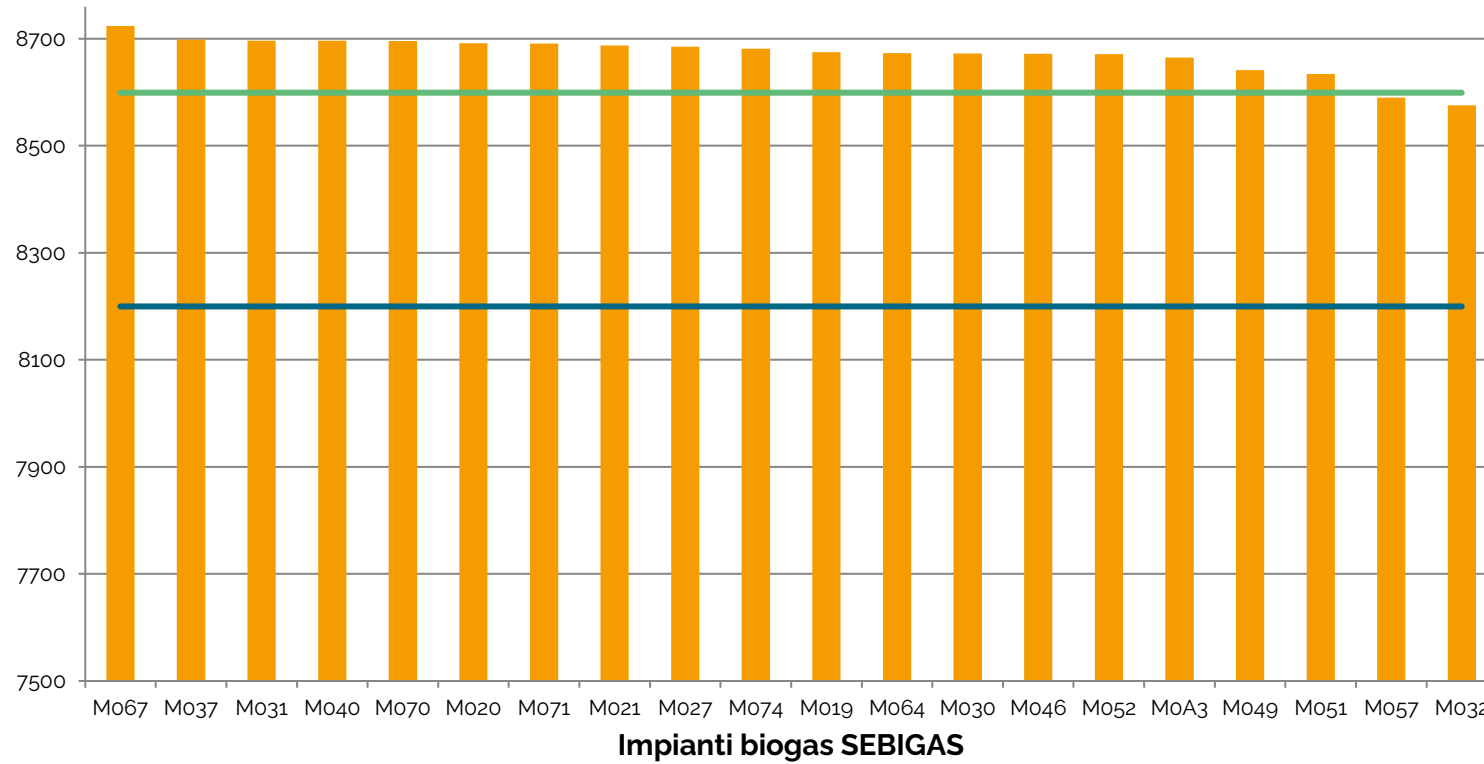
RELIABLE

GLOBAL

 **SEBIGAS**

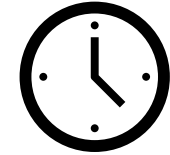
Efficient

Ore annue di funzionamento a massima potenza



— Ore annue per Business Plan = 8.200 h/y = 93,6%
— Media impianti SEBIGAS = 8.599 h/y = 98,2%

8.599
h/year



Average hours of operation

98%



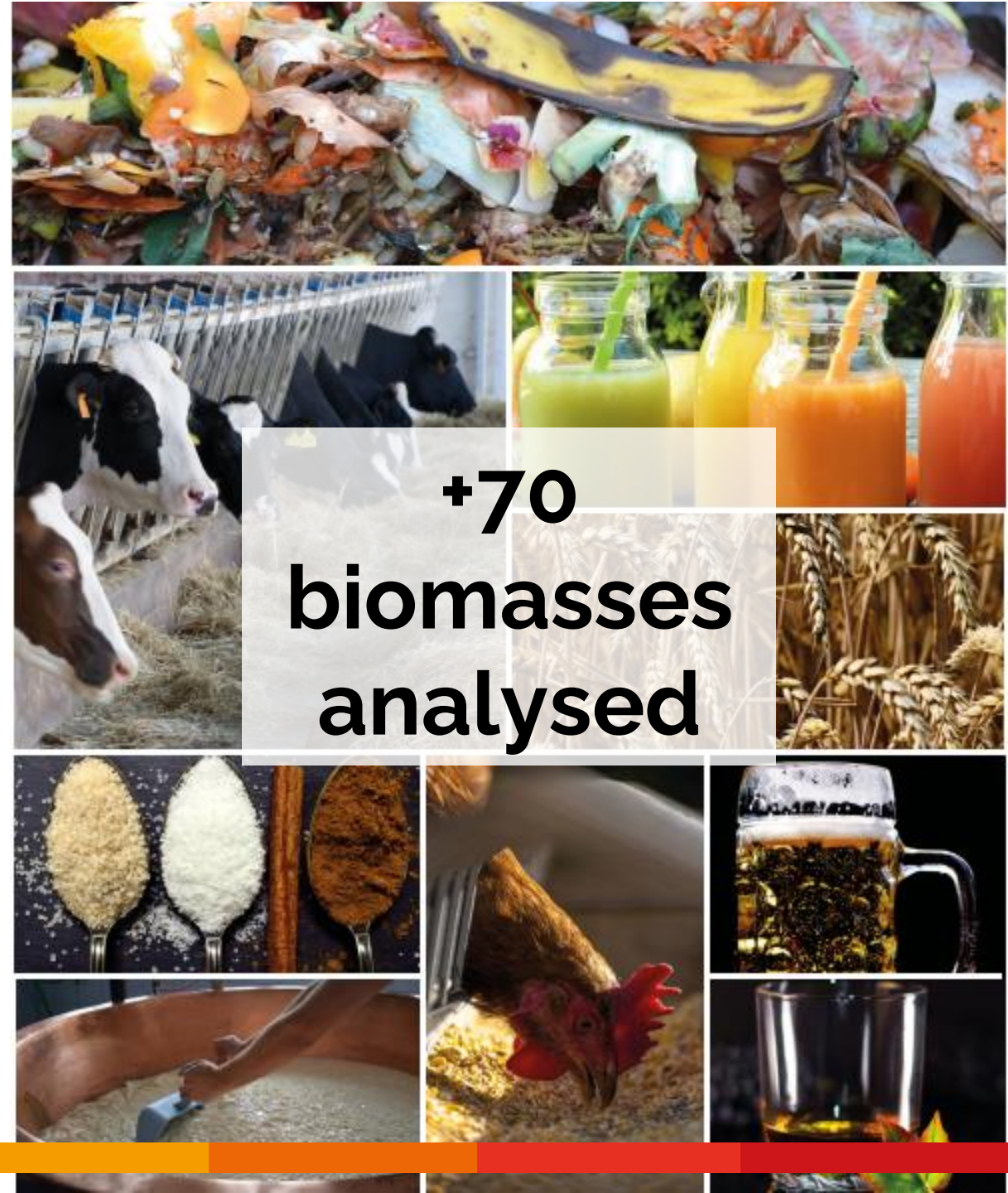
Plant availability at maximum power

Why Sebigas

Tailored

FLEXIBLE technology

TAILORED plants according
to the client needs and
requests



**+70
biomasses
analysed**

Why Sebigas

Reliable

84 

PLANTS INSTALLED

+70 

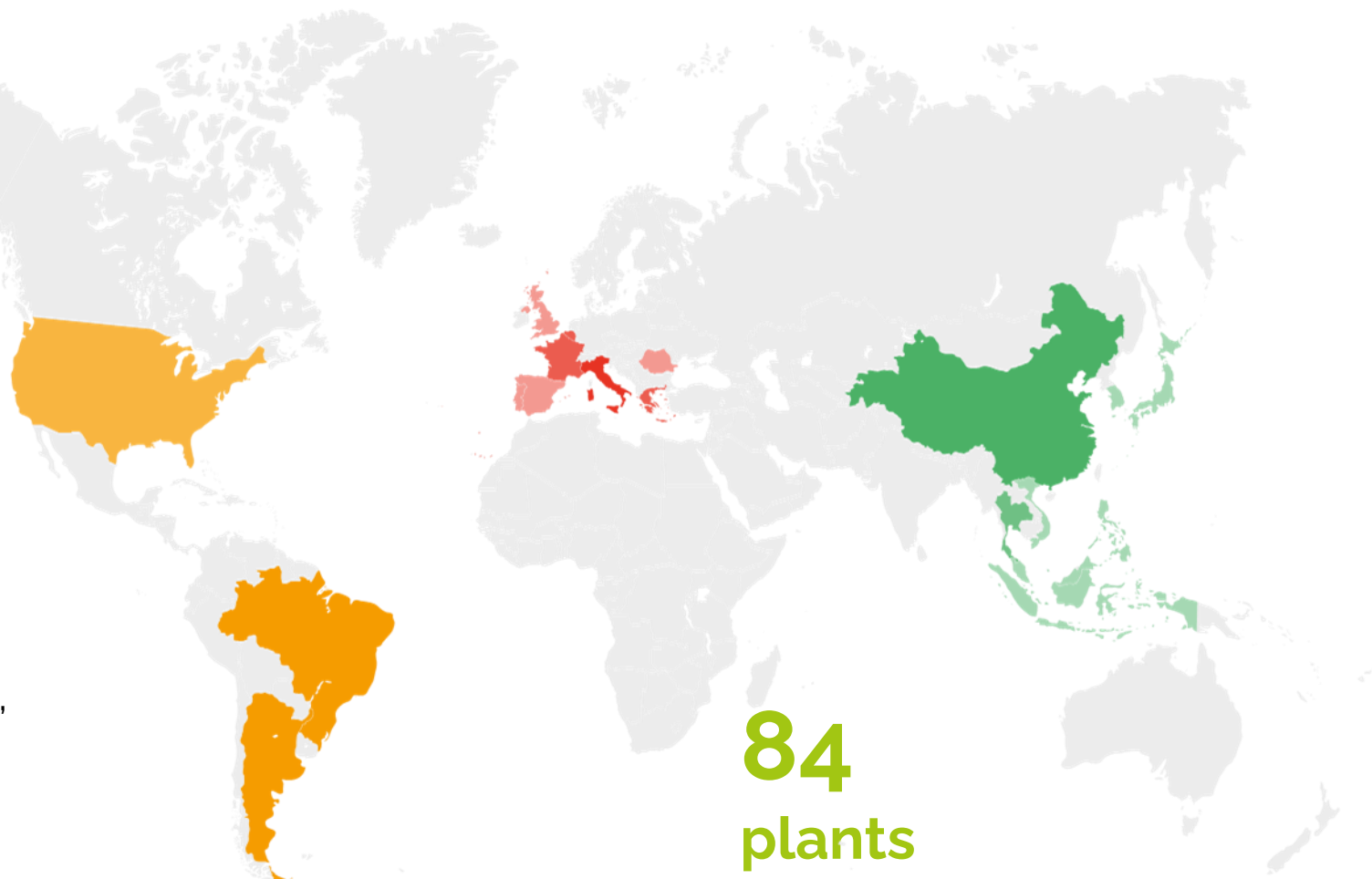
MW INSTALLED



Global

SEBIGAS operates in the **International** markets with installations, branches and an active sales network.

SEBIGAS has proven **expertise** in European, American and Asian countries, demonstrating its ability to develop flexible solutions for every different setting, and for the many areas of application of anaerobic digestion.



3
continents

84
plants





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