Themis

Biotechnology & Life Science

THEMIS WRT

WWW.THEMIS-INDUSTRIES.COM

ENG

Index

Water Scarcity InnoWise Challenge Lab

European Institute of Innovation & Technology

The EIT is a body of the European Union

Member Of LE2C LOMBARDY ENERGY CLEANTECH CLUSTER

Context

Managing waste in a more sustainable way in line with the dictates of the Circular Economy has now become an imperative that no company can evade.

TThe disposal of some waste such as:

- sewage sludge;
- sludges from chemical or pharmaceutical industries;
- industrial wastewater of various matrices;
- waste from agri-food production;
- waste from cultivation;
- OFMSW;

constitutes a significative item of expenditure in company financial statements, with costs more and more growing due to increasingly stringent sector regulations.

Actually, the presence of water in high quantities in these types of waste represents an important opportunity, since its removal and eventual recovery allows for a substantial reduction in the volumes to be disposed of as well as a huge benefit in terms of environmental impact.

To achieve this result, however, it is necessary to adopt a new economically sustainable treatment method, that is, with operating costs significantly lower than those of traditional technologies currently available on the market.

Equally important is to ensure further differential advantages, avoiding the typical bad side effects that traditional systems, now obsolete, entail for sludge reduction.

In short, innovative and revolutionary technology is needed, capable of overcoming the limits of current technologies, guaranteeing exceptional results together with a real economic advantage. **Themis WRT - Waste Recovery Technology, is the perfect answer to this need, being an innovative technology for the drastic reduction and enhancement of waste with limited operating costs. A unique and concrete solution of Circular Economy, capable of transforming waste destined for disposal into a new resource.**

Innovative system for the drastic reduction of waste.

MADE IN ITALY

PATENTED

IoT

zero emission

Themis WRT is an innovative patented technology for the treatment of various waste, mainly but not exclusively with an organic matrix, whose efficiency, speed and versatility make it unique.

The performances are truly exceptional: Themis WRT guarantees a reduction of up to 90% of the original volume and also the enhancement of the product through a multi-process treatment (evaporation, drying, granulation, mixing) of the incoming matrix. All this with an exclusive fundamental advantage, namely minimal operating costs.

The machine can use already existing thermal vectors (hot water flows, condensate returns from steam lines) for its operation.

In this way, it is possible to exploit otherwise dispersed enthalpy codes at zero cost, by accessing rewarding regulations such as (in Italy) the “White Certificates”.

Themis WRT is for sure the most advanced solution currently available for the treatment of sludge and organic and non-organic waste to reduce volumes and, consequently, costs.

Themis WRT, which operates with zero emissions into the atmosphere, represents a real and concrete application of the concept of Circular Economy as it allows the reuse of both the water contained in the original waste and the dry product.

The design is totally “tailor-made”: each machine is studied and built based on the specific context in which it will operate.

Themis WRT is also managed by our “Genesi” software which, in addition to making the system fully automated, allows the monitoring of every single operational parameter in real-time even remotely.

Versatility is another important exclusive feature of WRT technology.

The system is ideal for matrices of different nature and is perfectly suited for applications in multiple production sectors.

Sludges, sewage, food waste, wastewater.

1 **Production processes generate very high volumes of waste.**

2 **The WRT plant is integrated at the end of the production process and receives the waste as input.**

Themis WRt operates with minimum opex.

Recycling of water and dried product.

3 **The WRT plant treats the waste by operating in fully automatic mode.**

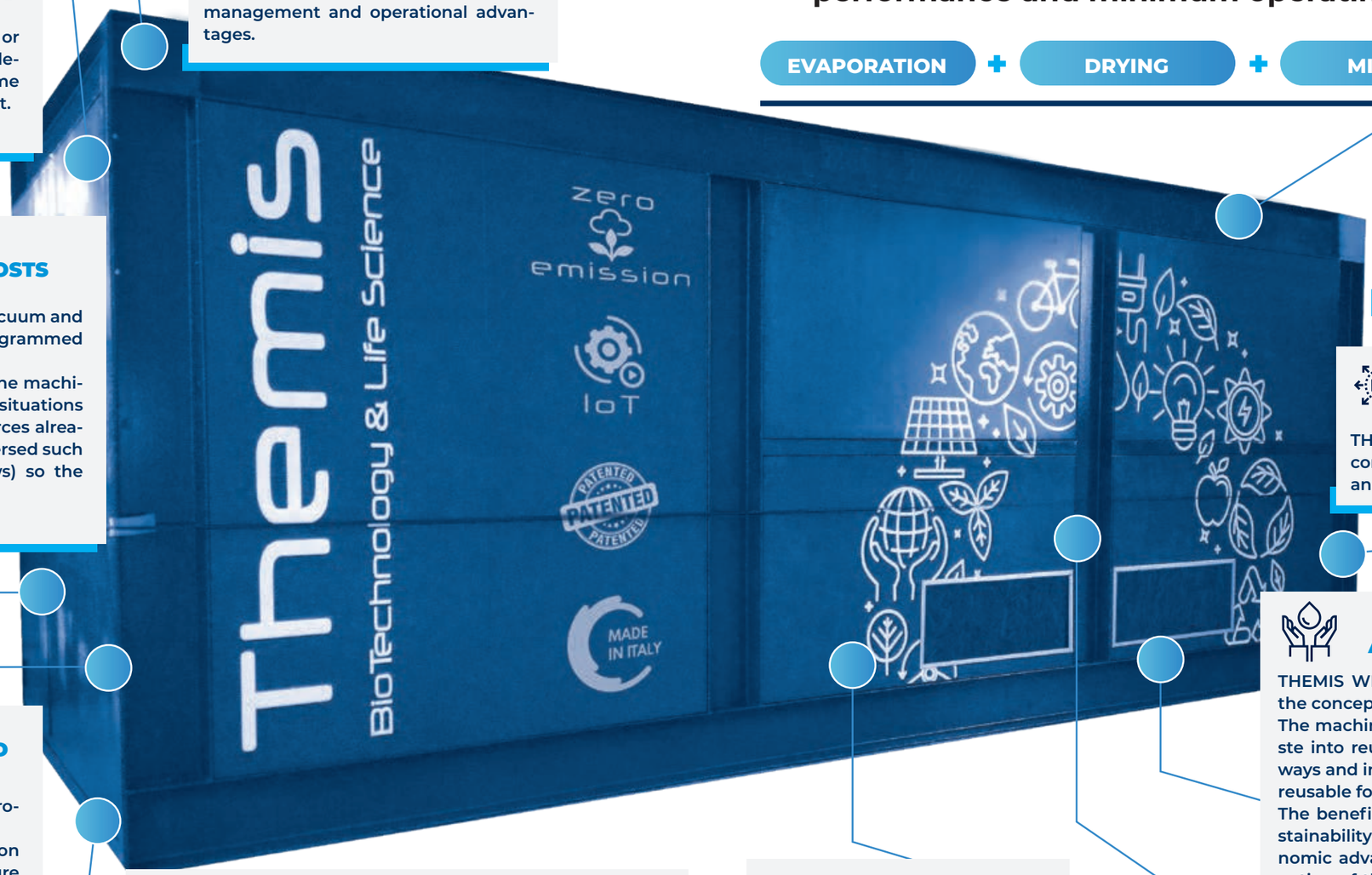
4 **Original volume is reduced by up to 90% and is transformed into distilled water and a dry product.**

REDUCTION BY UP TO 90%

Advantages

Innovative multi-process technology with high performance and minimum operating costs.

EVAPORATION + DRYING + MIXING + GRANULATION



ABSOLUTE PATENTED INNOVATION WITH UNIQUE PERFORMANCE

THEMIS WRT is an absolute and patented innovation.
It is at the same time an evaporator, a dryer, a mixer, a granulator and a vacuum concentrator.
The machine can dry different solid or colloidal matrices up to the desired degree not only to reduce their volume but also to enhance the final product.

DRASTIC REDUCTION OF DISPOSAL COSTS

THEMIS WRT guarantees a drastic reduction in the volume of waste destined for disposal (up to 90%), consequently allowing for enormous economic savings relating to landfill costs.
The reduction of the volume of waste generated also entails considerable management and operational advantages.

MINIMUM OPERATING COSTS

THEMIS WRT works under vacuum and requires simplified and programmed mechanical maintenance.
The energy requirement of the machinery is limited (especially in situations of connection to energy sources already available but usually dispersed such as hot water or steam flows) so the “opex” significantly reduces.

SANITIZATION STABILIZATION HIGH QUALITY

THEMIS WRT genera un output igienizzato e stabilizzato, garantendo un prodotto finale di alta qualità.

REDUCED DIMENSIONS AND “PLUG & PLAY” MODE

THEMIS WRT can be easily installed even in confined spaces thanks to its limited size and skid structure.

RECYCLING OF WATER AND TREATED PRODUCT

THEMIS WRT is the perfect application of the concept of Circular Economy.
The machinery transforms the original waste into reusable distilled water in various ways and into a treated product that is also reusable for different applications.
The benefit in terms of environmental sustainability is evident, as obviously the economic advantage deriving from the elimination of the material to be disposed of is clear.

HIGH PROCESS SPEED

THEMIS WRT has extremely short process times.
The advantage in terms of execution speed differs depending on the nature of the treated matrix, but in any case, the time taken to obtain the final result is much lower than that used by any other technology currently available.

AUTOMATION AND REMOTE CONTROL

THEMIS WRT is managed by our “Genesi” software which allows remote control. Operation is totally automatic and does not require the presence of a dedicated or specialized operator.

ZERO EMISSION

THEMIS WRT operates in the total absence of harmful emissions into the atmosphere, nor of sewage or unpleasant odors.

VERSATILITY “TAILOR-MADE” DESIGN

THEMIS WRT is extremely versatile and can handle multiple typologies of matrices. Furthermore, there is no standardized version of the machine, as the design is made “ad-hoc” to respond to each specific problem-statement.

The Technology

Our technology is, in fact, an integrated response to the economic, technical and environmental aspects relating to waste treatment, through a volumetric concentration process with the condensation of the generated vapours and the formation of a final product in an aggregate and stabilized form.

VACUUM EVAPORATION

By lowering the boiling point of water, a net reduction in the energy consumption necessary for the operation of the machinery is obtained.

CONDENSATION OF VAPOURS

The condensation of the vapors avoids emissions into the atmosphere, as is the case for many other drying technologies.
This allows for an important technical, managerial and administrative simplification.

MIXING SYSTEM

The reactor is equipped with a mixing system that guarantees both the efficiency of the heat exchange and the optimal handling of the material inside the reactor.

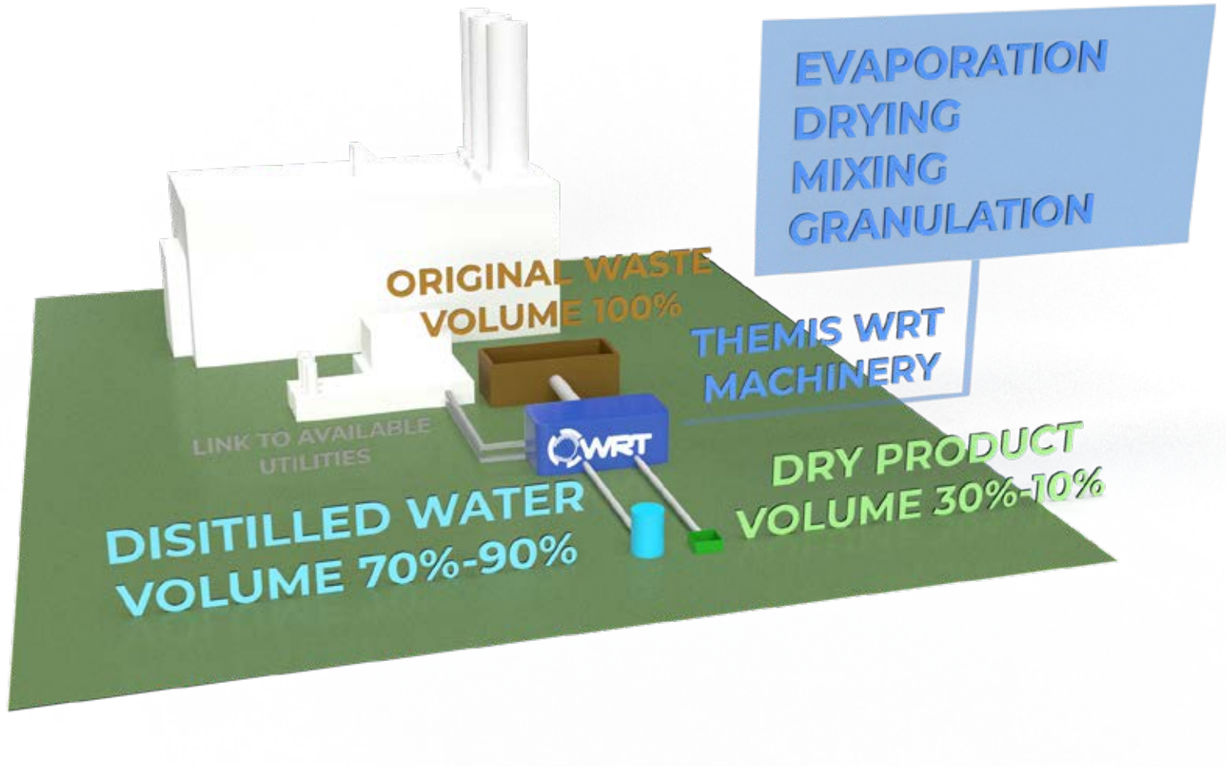
Depending on the customer's requests, it is possible to activate additional optional processes to obtain specific output results:

MICROWAVE EMISSION

This treatment, in addition to contributing substantially to drying, makes it possible to stabilize the matrix.

ADDITIVATION

Through the targeted dosage of biotechnological solutions, it is possible to further improve the product obtained in output from the machine.

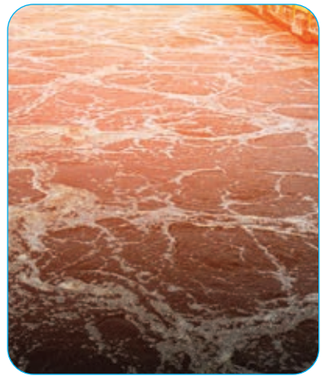


The implementation of a Themis WRT plant in your treatment system is extremely simple and highly effective.
The machinery is installed in "Plug & Play" mode, integrating into the last phase of the production process, where it receives the waste to be treated at the entrance.
The operation can take place both in batch and in continuous, according to the needs of each specific situation.
Operation is fully automatic, managed by the appropriately configured "Genesi" software.
The treatment consists of carrying out various processes: mixing, vacuum evaporation, drying and granulation.
Each parameter is monitored in real-time by the "Genesi" software even with a remote connection.

The perfect solution that allows companies to obtain a high economic advantage and at the same time reduce the environmental impact of their business.

Applications

Thanks to its versatility, the THEMIS WRT machine is ideal for applications in many industrial sectors and activities.



- PURIFICATION SLUDGE
- LIQUID WASTE
- WASTEWATER
- OFMSW
- FOOD WASTE
- SLAUGHTERING WASTE
- ZOOTECHNICAL WASTE
- SEWAGE
- DIGESTATE

THEMIS proposes itself as a special partner that collaborates and supports its customers in the transition to a Circular Economy system.

Research and Innovation: the pillars of our business.

The innovative Themis WRT technology is tailored to the specific needs of each customer.

To identify the optimal configuration, we inspect the customer's site and acquire preliminary information about the nature of the waste and its treatment.

Thanks to the proprietary software we can perform a virtual execution of the waste treatment through the Themis WRT plant, thus obtaining a preliminary assessment of the results achieved through a hypothetical implementation of the WRT machinery in the customer's waste treatment process.

At this point, a test session is proposed with our pilot plant to validate the virtual result. The goal is to verify together with the customer that the performance of the machinery is ascertained.

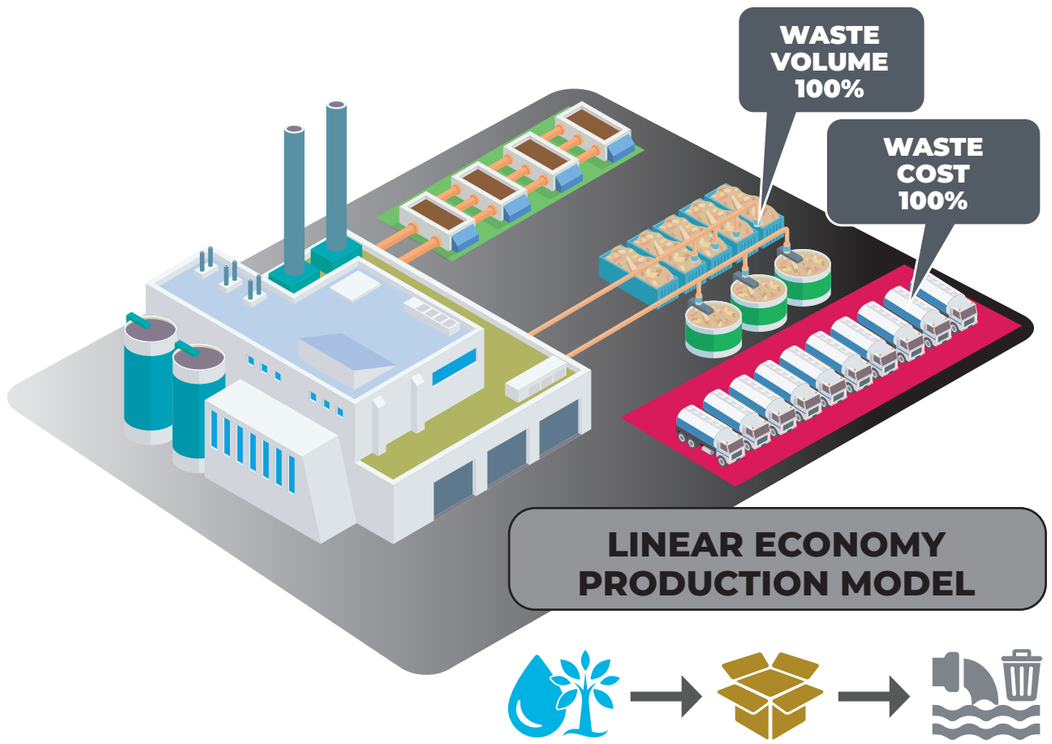
Therefore we treat a sample of the waste by returning to the customer the real product transformed by the machine, i.e. distilled water and a small amount of solid waste treated.

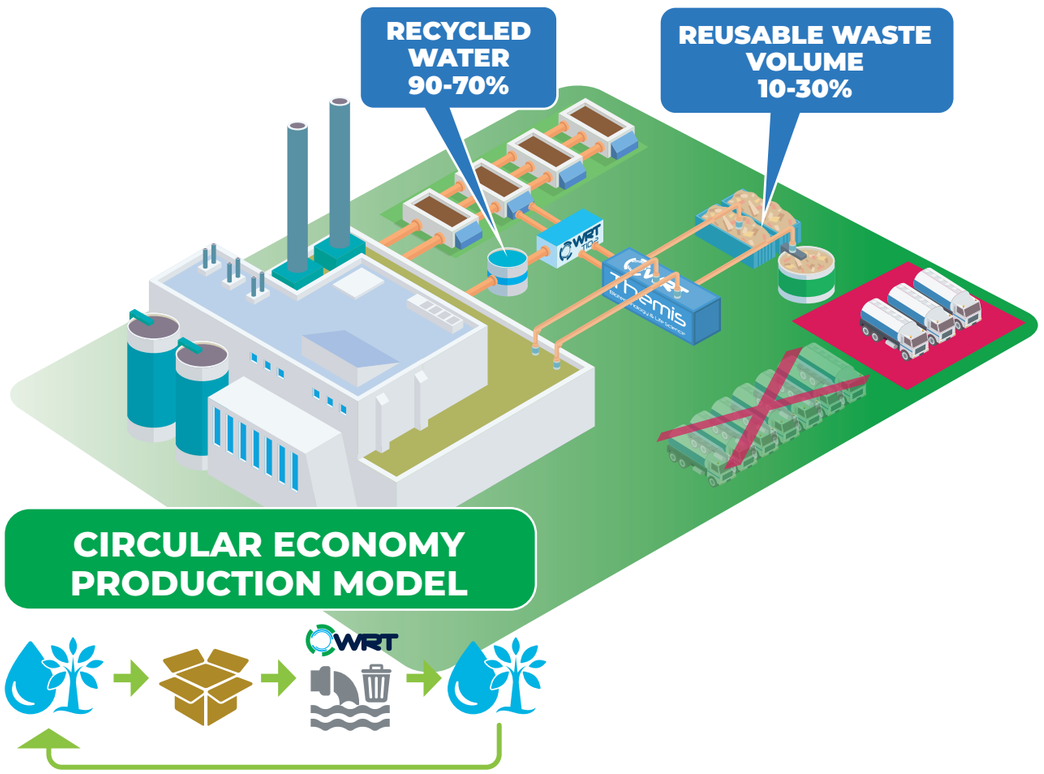
During the testing phase, we use our internal laboratory, the "Themis LAB", which is a real laboratory specialized in carrying out specific tests and analyzes for the treatment of waste.

Thanks to this structure we can provide personalized consulting service and integrated study of "waste management", supporting our customers in the optimization of the disposal processes, both in operational terms and, above all, in terms of economic savings.

Our goal is to identify methods and techniques that can bring concrete benefits in the management and disposal of organic waste, with particular reference to industrial and agricultural sludge, wastewater, food waste.

The Transition





- **HIGH COST FOR DISPOSAL OF WASTE**
- **HIGH CONSUMPTION OF WATER AND ENERGY RESOURCES**
- **NO RECYCLING**
- **WASTE MANAGEMENT CAUSING TROUBLES**
- **HIGH RISK OF EXCESS SANCTIONS**
- **STRONG ENVIRONMENTAL IMPACT**
- **NEGATIVE CSR**

Traditional technologies currently used for waste management, such as filter presses or dryers, have limited performance and high operating costs, while the volume of waste to be treated is constantly increasing.

The impact on the global waste management system is worsening day by day, with a very negative effect on the environment.

The waste disposal process is becoming more and more problematic, with treatment facilities unable to handle the growing volumes resulting in a constant increase in costs.

- **DRASTIC REDUCTION OF DISPOSAL COSTS**
- **DRASTIC REDUCTION IN THE USE OF RESOURCES**
- **REUSE OF RESOURCES**
- **SIMPLIFIED WASTE MANAGEMENT**
- **ELIMINATION OF THE RISK OF EXCESS SANCTIONS**
- **NO ENVIRONMENTAL IMPACT**
- **POSITIVE CSR**

The transition from an unsustainable linear economy system to a virtuous circular economy system requires a modernization of the technologies used by industries for the treatment of their waste.

THEMIS WRT technology helps to achieve the “zero-waste” goal by transforming waste into a reusable resource: nothing is lost and disposal costs are drastically reduced.

THEMIS WRT meets both the business needs of cost reduction and the social need to reduce the environmental impact.

THEMIS WRT

Themis S.p.A.
Via Brescia, 13
20025 Legnano - Milan - Italy
phone. +39.0331.456228
info@themis-industries.com
www.themis-industries.com