

ENAL<sup>PRO</sup>  
energia alternativa

*air conditioning*

T H E R M A L   E N E R G Y   S T O R A G E



# TES - Thermal Energy Storage

**Thermal energy storage** (TES) is particularly suited to air conditioning and industrial refrigeration systems.

Usually traditional air conditioning systems operate throughout the day especially during the hottest hours to meet instantaneous demand and remain idle at night. These chillers are designed to meet the maximum daytime instantaneous cooling demand, which only occurs a few days each year.

The TES energy storage system is a flexible and reliable solution for the management of important energy needs. It enables a significant reduction (up to 70 %) to the chiller capacity of machines which have been installed or are to be installed. The capacity can now be calculated according to the total demand in 24 hours and no longer according to peaks of maximum instantaneous cooling demands.

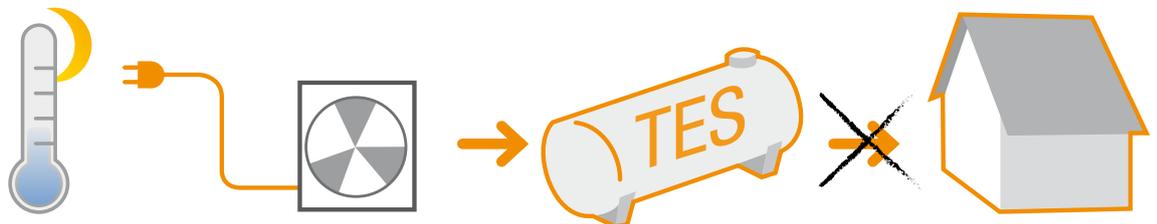
The TES system from ENALpro allows energy storage at night (period of low tariff electricity and lower outside temperatures) and uses it by day, thus permitting significant savings in running costs.

Nowadays it has become essential to optimize energy consumption.

A modern, eco-friendly company has to invest in technology, optimize product quality and most of all significantly reduce energy costs.

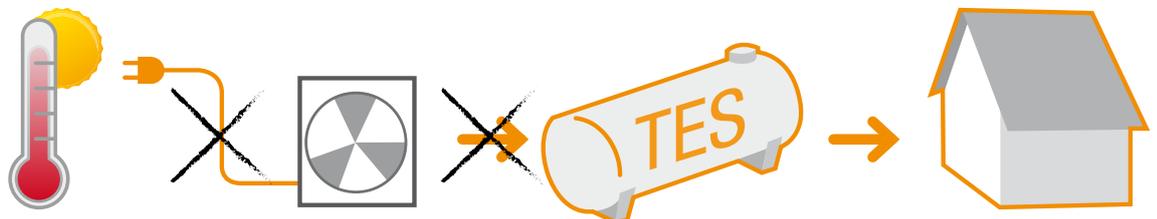
## AT NIGHT

TES technology enables the storage of cooling at night in conditions of maximum chiller efficiency.



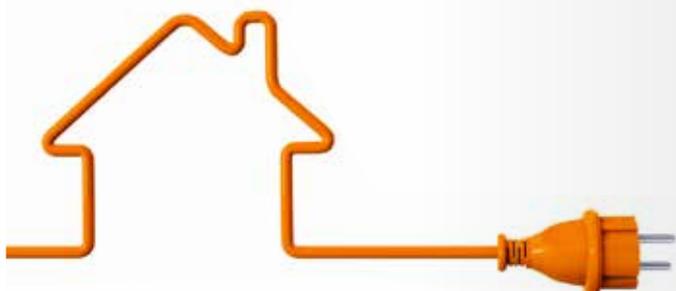
## BY DAY

The energy stored at night is released during the day.



## EUTECTIC LIQUID

Thermal energy is stored in a particular liquid called PCM Phase Change Material which has **14 times the storage capacity of water** and allows significant savings of costs and space.



### **TO REDUCE**

- chiller size by 30 - 70%.
- electrical demand
- plant room space
- operation & maintenance costs

### **TO INCREASE**

- cooling capacity from existing plant
- smoothness of electrical load profile
- system life expectancy
- the COP of the system



### **TO SAVE ENVIRONMENT**

- reduction of CO2 emission
- reduction of electrical consumption during peak hours
- better energy management

**REDUCES  
YOUR COOLING  
COSTS UP TO**

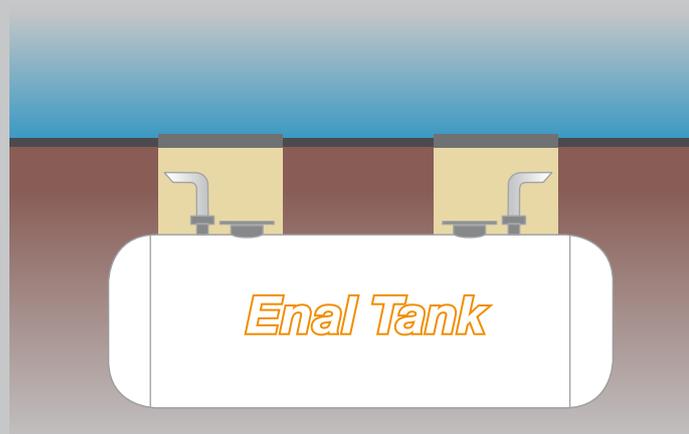


# TYPES OF STORAGE

## OUTSIDE STORAGE



## UNDERGROUND STORAGE



### *Enal Tank*

The dimensions of the energy storage tank are calculated based on the thermal performance requirements of the project and for existing plants on the plant space available. The tank may be cylindrical (for service pressures up to 10 bars) or rectangular (concrete and steel) for atmospheric pressure.

Tanks can be designed horizontally, vertically and even placed underground.

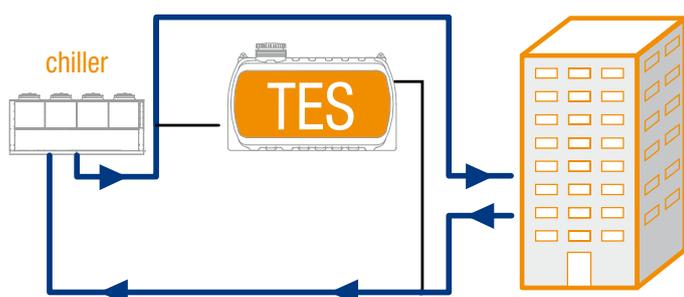
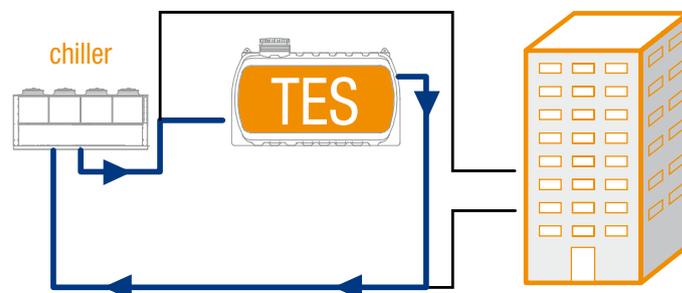
**ENAL**PRO  
energia alternativa

*Our technical staff are able to propose and develop the best solution for any specific requirement.*

# HOW IT WORKS

## STORAGE

The energy produced by the cooling system at night is stored in the ENAL tank, under favourable outdoor temperatures and low energy tariff conditions.

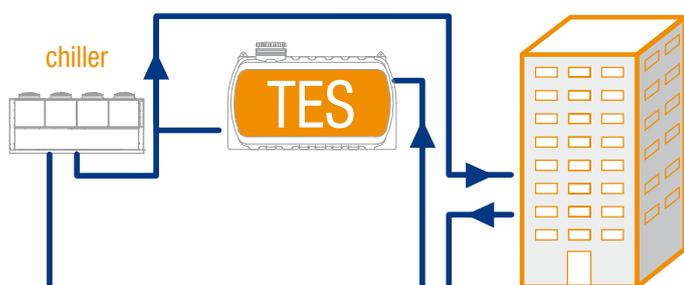
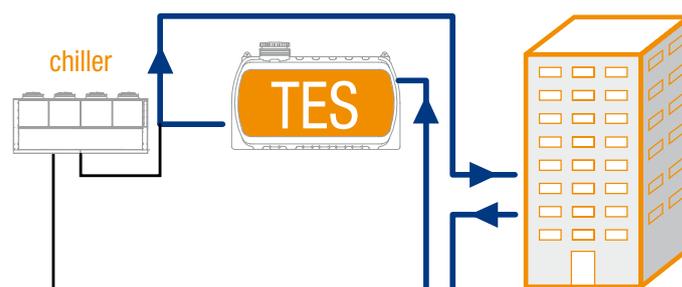


## DIRECT PRODUCTION

In moments of low energy demand, it is sufficient to use only the chiller.

## ENERGY RELEASE

The energy stored in the ENAL tank is released during the day and the chiller is switched off in this period.



## ENERGY RELEASE AND DIRECT PRODUCTION

During peak hours it is possible to use both the energy stored at night and that directly produced by the chiller.

# PRACTICAL APPLICATIONS



Hotels - Restaurants - Pubs - Bars



Commercial Complexes - Offices



Fitness and Wellness Centers - Schools



Shops - Showrooms



Residences - Luxury Villas

# SOME USES OF TES IN ITALY



## AIRPORTS:

Aeroporto di Ancona

## BANKS:

Banco di Sicilia (Torino)  
Banco Ambrosiano (Milano)

## WINE BARS:

Wine Cellar I  
Wine Cellar II  
Cantina Pezzobon (Treviso)  
Cantina Franciacorta (Cremona)

## FOOD INDUSTRY:

Sebaste I (Gallo-Cuneo)  
Sebaste II (Gallo-Cuneo)  
Vegetable Cooling Venezia  
Berneri spa (Lallio-Bergamo)

## INDUSTRIES:

Enel Venezia

## HOSPITALS:

Istituto Ortopedico Messina  
Ospedale di Trecenta (Rovigo)

## RESTAURANTS:

Ristorante Zanni (Rimini)  
Ristorante Fernando (Pescara)  
Vecchio Ristoro (Pescara)

## SUPERMARKETS:

Coop Torino  
Coop Ancona

## MALLS:

Nuova Fiera di Rimini

## OFFICES:

Palazzo Borghese (Roma)  
Napoli Office CNA  
Garoshi Torino  
CEAS Matera  
Comune di Medicina I  
Comune di Medicina II  
ISIT (Alessandria)  
Bingo (Palermo)  
Bingo (Putignano)  
VEMAT (Roma)

## RESEARCH AND DEVELOPMENT:

Università di Brescia I  
Università di Brescia II

## PHARMACEUTICAL INDUSTRY:

Glaxo (Parma)

## MALLS:

Caselle (Torino)  
Alenia (Napoli)  
Studentato di Bologna  
Generali Assicurazioni  
CES (Matera)  
Villa Marina (Bologna)  
Nuova Fiera di Rimini

## UNIVERSITIES:

Università di Ancona  
Università di Milano

## WHO IS ENALpro

Leading company with a long experience in the field of technology plants:



- Research
- Design
- Installation
- Maintenance

We assist our clients throughout the whole process.

# ENALPRÒ

energia alternativa

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