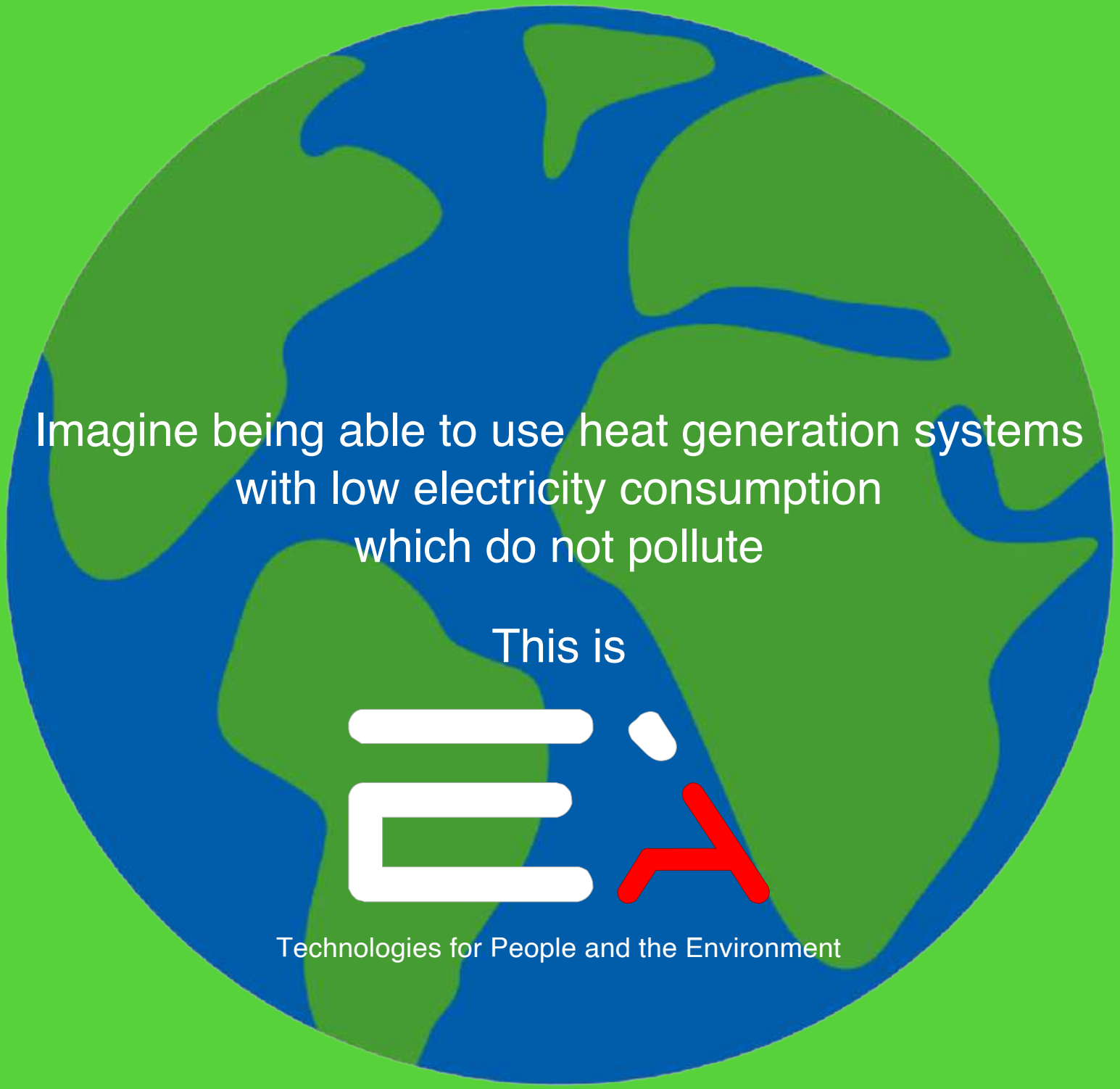

Imagine being able to use heat generation systems
with low electricity consumption
which do not pollute
This is
Technologies for People and the Environment



Think of being able to heat the environment and the water in the house and to use appliances for cooking at reduced costs and without dispersing polluting substances into the environment.

Think to can do it using the electricity produced by solar panels and therefore at ZERO COSTS and ZERO EMISSIONS.

## EU Green Department Report (12/2024):

The proposed solution demonstrates a high degree of novelty by leveraging carbon filament resistive modules powered by electricity to create energy-efficient, non-polluting heating products. Unlike traditional heating technologies, such as heat pumps, this approach significantly reduces energy consumption and operational costs. Furthermore, when paired with renewable energy sources like solar panels, it has the potential to eliminate user costs altogether and greatly minimize environmental impact. This innovation extends beyond a single product, encompassing a diverse range of applications, including floor and wall heating modules, hot water boilers, furniture radiators, stoves, and barbecue plates. The integration of an IoT control unit as a standard feature in select products introduces a smart, user-friendly experience, adding even greater value and versatility to the offering.

**The innovation sets a new standard in the energy-saving sector, positioning itself as a pioneer in the development of advanced, environmentally friendly heating technologies.**

# ENERGY IS THE MOST IMPORTANT AND CRITICAL GOOD FOR OUR COMMUNITY

THE CONTEXT

Energy is one of the main factors of interest in all countries of the world and will be needed in ever greater quantities!

ENERGY GENERATED ONLY FROM NON-FOSSIL OR HYDRO-CARBON SOURCES: this is the commitment made by all countries in the world, starting from 2050; commitment established in the United Nations Framework Conventions on Climate Change, during the annuals COP (Conference of the Parties).

The European Community has made very ambitious commitments (timing) and launched financial support programs to achieve the objectives, to which national support is added.

The choice seems to favor the use of ELECTRIC ENERGY (see what has been decided, for example, for the automotive sector...).

The TRAJECTORS are:
a) encourage the production of energy from non-polluting sources (solar and wind) to which hydrogen and FUTURE nuclear fusion are added;
b) USE SYSTEMS CAPABLE OF REDUCING CONSUMPTION.





# HOW WE CAN REDUCE CONSUMPTION

Now, to produce heat we still use polluting systems (hydrocarbon or gas boilers, wood, pellets) and to cook we use gas appliances or with metal electric resistances.

Almost all of them, still use OLD TECHNOLOGIES and CONSUME A LOT.

As for the transport sector, WE MUST DEVELOP NEW TECHNOLOGIES ALSO THANKS TO THE USE OF DIGITAL TECHNOLOGIES.



# WE CAN USE A NEW TECHNOLOGY

Use innovative electrical resistors, made with carbon filaments.

THE CHARACTERISTICS OF CARBON FIBER
- absence of thermal inertia
- ability to store heat in large quantities
- releases heat very quickly
- durable over time
- same efficiency in any temperature condition (-40/+300°C)
- has no thermal expansion
- does not oxidize
- it is flexible
- it is recyclable
- does not produce electromagnetic fields
- consumes less than metal electrical resistors

The specific characteristics of carbon fiber ensure that the performance of the relevant resistive systems is significantly superior to any other system powered by electricity.

We have created innovative electrical RESISTIVE CABLES with carbon filaments, to create MODULES and PRODUCTS, to heat rooms and sanitary water



# WHAT IS E'A

After years of Research and Development, we have found the formula (number of carbon wires x length) that allows us to create electrical resistors that function at the required temperature.

Starting from the construction of the resistive filament, create flexible elements that can be used in floors, in heating panels, in new water boilers, in new cooking appliances.

220 / 380 V power supply.

BENEFITS FOR THE USER AND THE ENVIRONMENT

USER

It significantly reduces electricity consumption for heating, washing and cooking.
IF SOLAR PANELS ARE USED, THE COSTS ARE ZERO.

ENVIRONMENT

IT TOTALLY ELIMINATES POLLUTING EMISSIONS.

HOW THEY WORK

Floor resistors: modules to be placed under the upper finishing product (tiles or wood)

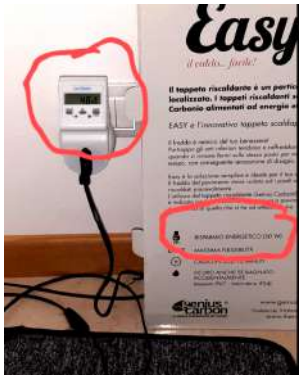
Resistors for heating panels / stoves: modules to be placed under the upper finishing product (tiles or wood or silicone)

Resistors for new water boilers: modules to be placed inside or outside the kettle

Resistors for household appliances: modules to be placed inside the household appliance.

... MANAGED WITH IoT CONTROL UNITS.

There is ONLY ONE Italian MANUFACTURER of heating products with a FABRIC with carbon filaments. Their consumption is equal to 140 Watts per square meter, compared to 60 Watts per square meter of our resistive modules.




Consumption of 50Watt but there is

ONLY a fabric of 70 cm x 50 cm = 0.35 Mq.

For 1 Mq the consumption is 140Watt

# CARBON WIRE HEATING DEVICE AND PROCEDURE FOR ITS MANUFACTURING (PATENTED)

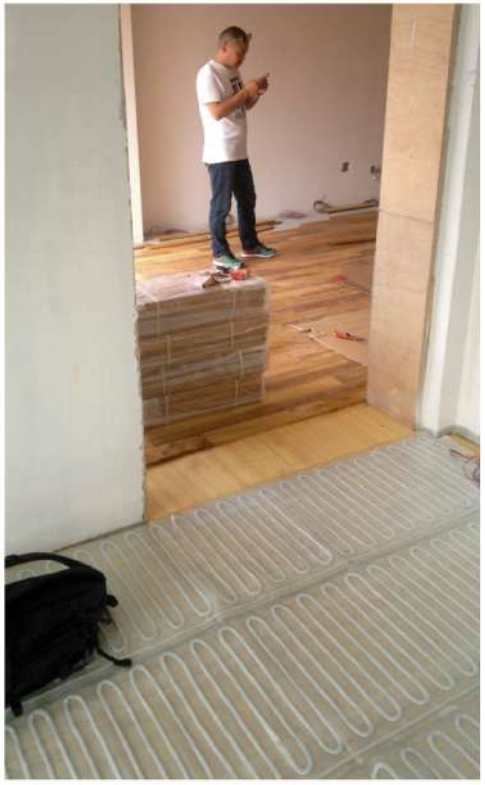
on the Conegliano – Valdobbiadene hills,
a UNESCO World Heritage Site

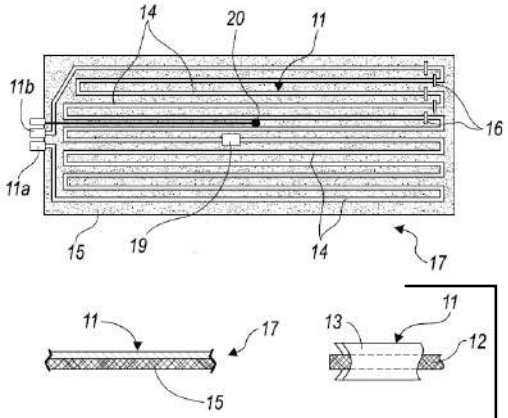


Home that has been using electric resistors with carbon filaments for 10 years (underfloor heating / stoves / water heating), powered by solar energy (solar panels).

It allowed us to COLLECT DATA to VALIDATE correct functionality over time, thermal efficiency and reduced consumption.

The limited thickness (of the resistors) allows for be used in renovation works also of historic homes.






Jack Chai, president of Nmg Composites CO. Ltd (https://www.nmgonline.sg/), supervises the ∈ A floor heating technology in his apartment in Tongxiang in September 2014. He purchased Soteco Espansi of Gorizia, headquarters of Nmg Europe (https://www.nmgeurope.com/it/)

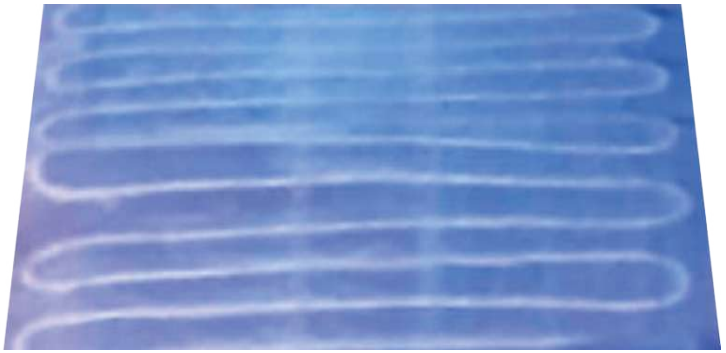
## CONSTRUCTION PROCESS OF THE CABLEand of the RESISTIVE MODULE

This technical solution is protected by Italian industrial patent IT102007901563241

# ELECTRIC RESISTIVE MODULES FOR HEATING ROOMS AND WATER

## PROTOTYPE (*TRL 7*)

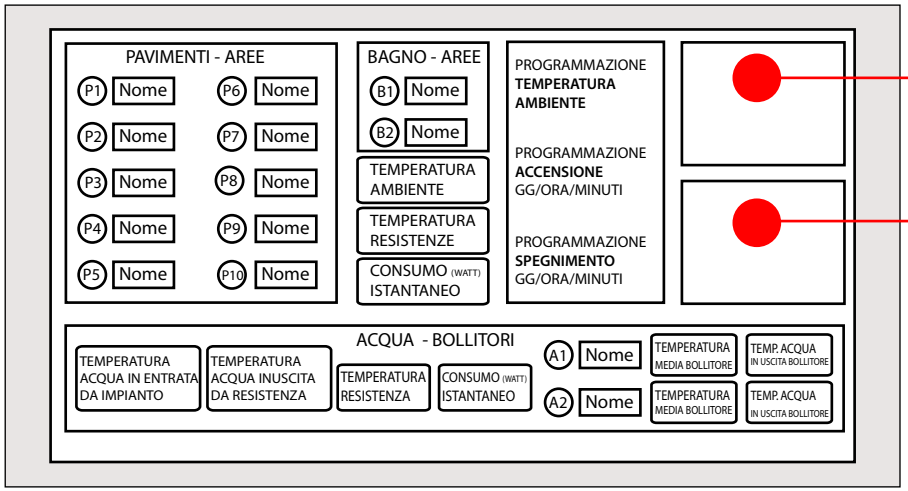
Resistive module for FLOOR HEATING
(tiles / wood)
temperature above floor max 25°



Initial energy consumption of 80 W/h for m2 (maximum consumption) // average at full capacity of 60 W/h per m2

IoT control unit: when the temperature is reached, it blocks the use of electricity and reuses it when the temperature drops by 10%

Touch Screen Panel - GENERAL HOME

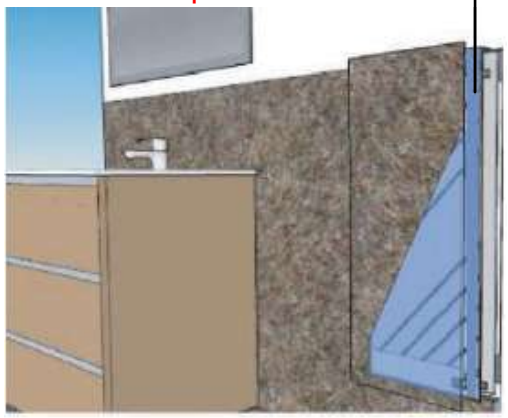



On / Off
Date / Hour / Minute
Outside Temperature

Connections
Internet
Wifi

## PROTOTYPE (*TRL 7*)

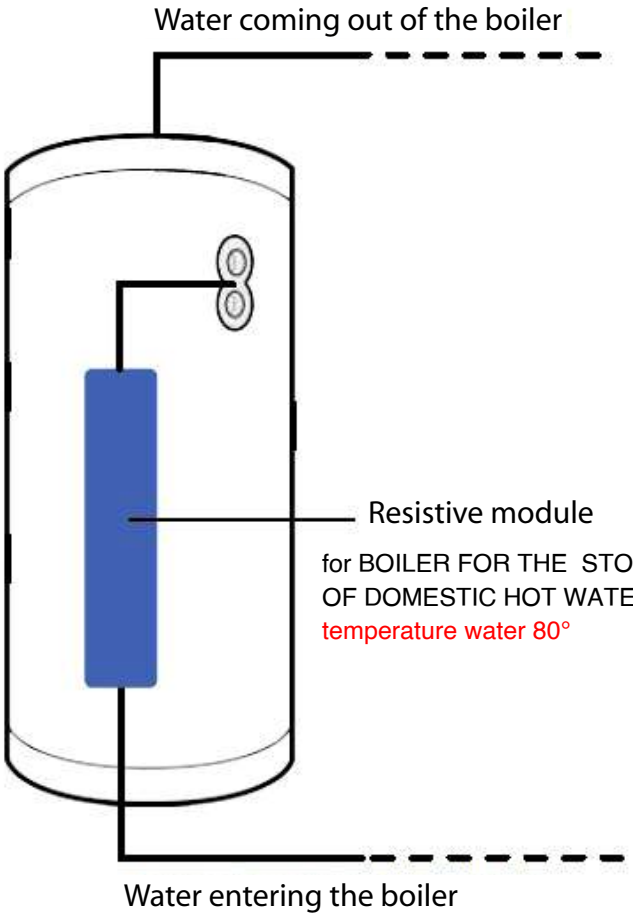
Resistive module for HEATING WALL FOR BATHROOM
max wall temperature 50°



Initial energy consumption of 400 W/h for m2 (maximum consumption) // average at 300 W/h

## Industrial Patent IT102024000012772

## PROTOTYPE (*TRL 7*)

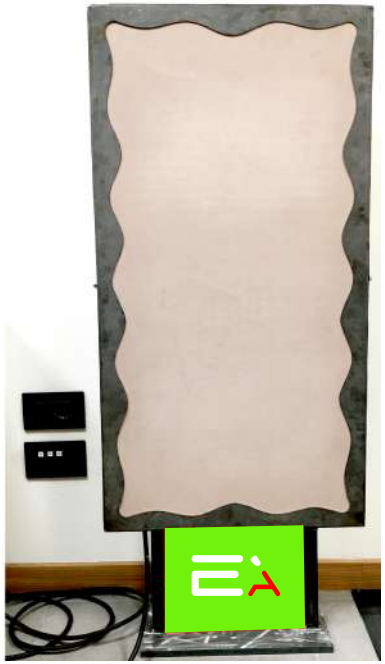



Initial energy consumption of 1 kW/h (maximum consumption) // average at 600 W/h

# PRODUCTS USING ELECTRIC RESISTIVE MODULES FOR HEATING (WITH NEW DESIGNS)

## PROTOTYPE (*TR*

Heating panel wall
(heated towel rail)
100 x 50 cm
70° temperature



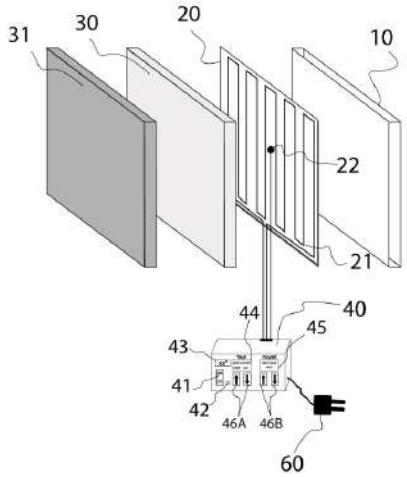
Initial energy consumption of 350 W/h (maximum consumption) // average at full power of 320 W/h

## PROTOTYPE (*TRL 7*)

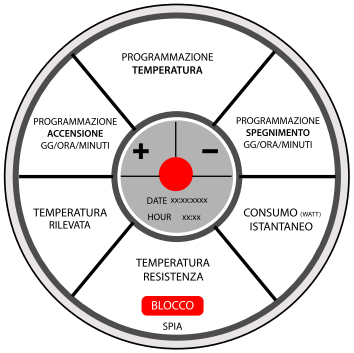
Stove 90 x 40 cm
80° temperature

Initial energy consumption of 600 W/h (maximum consumption) // average at full power of 450 W/h



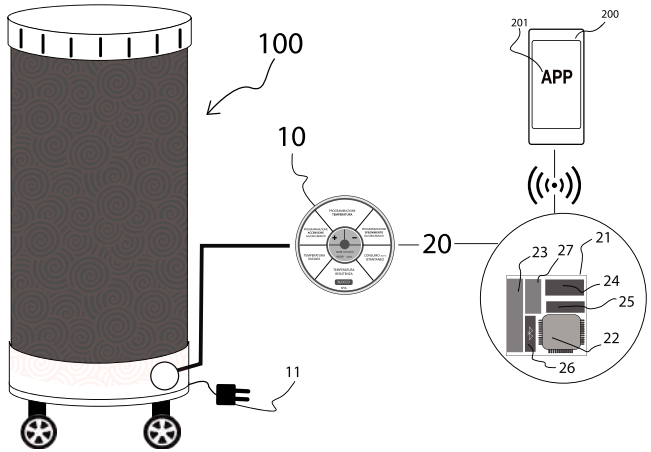



Management display




IoT control unit: when the temperature is reached, it blocks the use of electricity and reuses it when the temperature drops by 10%

Internet / Wifi Connections

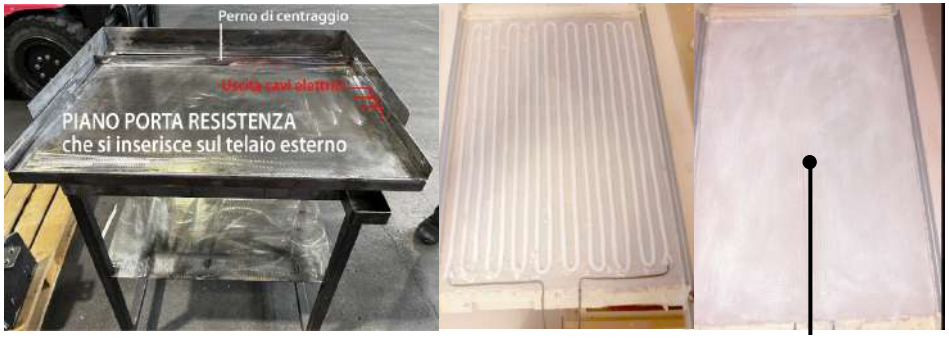



IT102022000007577 <--- technical solutions protected by Italian industrial patents ---> IT102024000012775

# PRODUCTS USING ELECTRIC RESISTIVE MODULES FOR COOKING (WITH NEW DESIGNS)

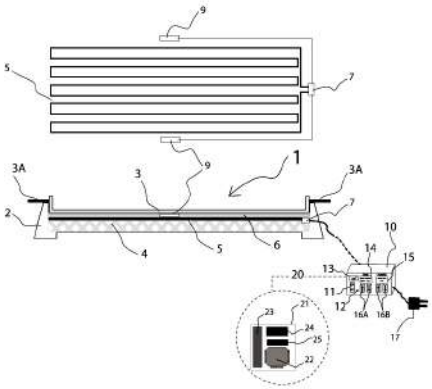
## PROTOTYPE (*TRL 7*)

BBQ COOKING PLATE
that can become an OVEN
(for pizzas) with a LID

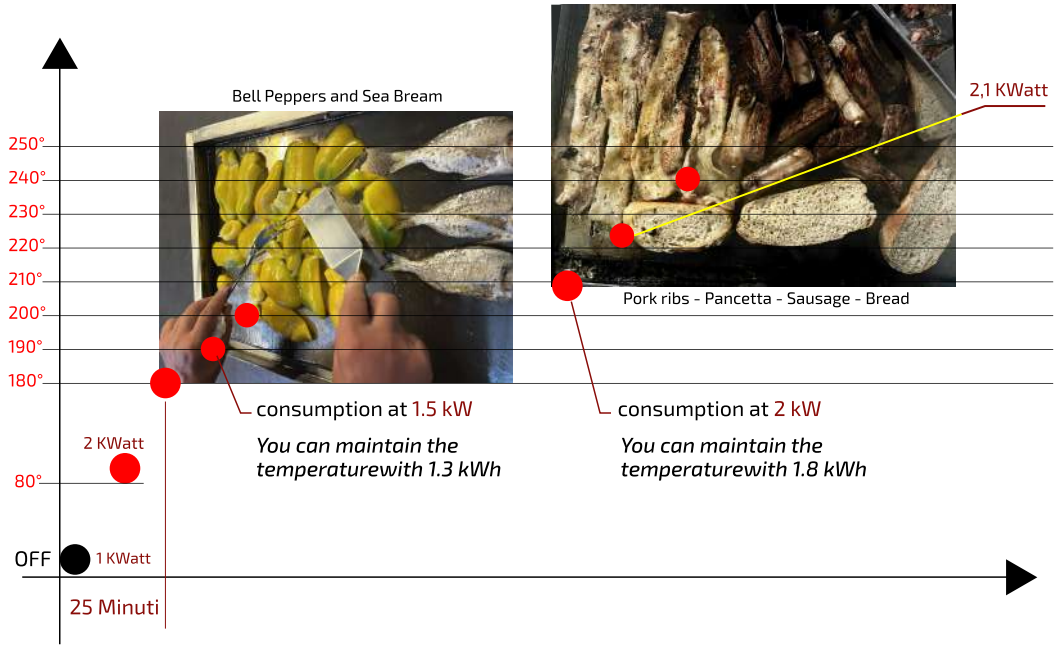






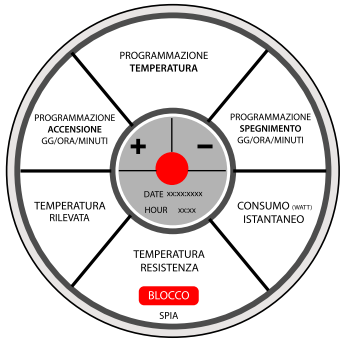


Industrial Patent
IT102022000007583




Initial energy consumption of 1 kW/h (maximum consumption) // average during steady-state operation of 2 kW/h

Management display

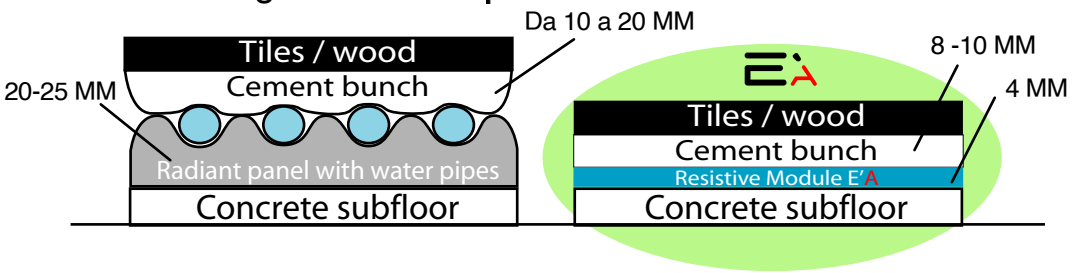


# “TRADITIONAL” COMPETITORS

## ELECTRIC RESISTIVE MODULES WITH CARBON FILAMENTSFOR SPACE AND WATER HEATING

There are no MANUFACTURERS on the market, of resistive modules similar to ours. The potential Italian Competitors offer systems with carbon resistive wires associated with a FABRIC, - for ONLY heating of environments - with consumption higher than our

The first possible comparison is with suppliers of floor or wall heating systems, with water pipes. The prices on the market are on average **90 Euro/Mq**.




They are thicker and become operational (heat up) after a longer time than our systems (3/4 h -- **E'A** 1 h)

THE INSTALLATION COSTS FOR THE USER ARE SIMILAR OR SLIGHTLY HIGHER

It should be noted that radiant floor or wall heating systems, with water pipes, need to be powered by boilers or heat pumps (additional costs)
E'A, NO!

## ELECTRIC RESISTIVE MODULES WITH CARBON FILAMENTS FOR HEATING AND COOKING PRODUCTS

Wall heating panels (heated furniture) with electric resistances or radiant wall panels with technology that emits long-wave infrared rays, see hundreds of Competitors all over the world... they are purchased through distributors / shops

Higher prices for infrared technology

THERE ARE NO HEATING PANELS OR STOVE ON THE MARKET WITH ELECTRIC RESISTANCES WITH CARBON FILAMENTS

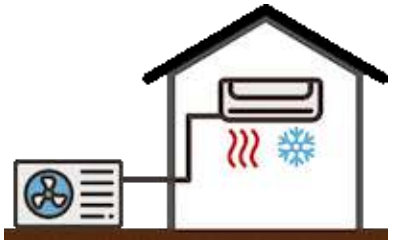
BBQ cooking plates are produced by hundreds of Competitors and especially in China.... they can be found on all the most important e-commerce sites

The best-selling ones are those powered by GAS because they heat the plate/plate up to temperature faster and CONSUME LESS THAN THOSE WITH ELECTRIC RESISTANCES (over 2 kW)

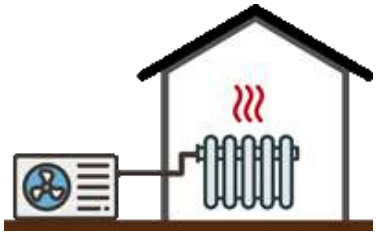
THERE ARE NO BBQ COOKING PLATES ON THE MARKET WITH ELECTRIC RESISTANCES WITH CARBON FILAMENTS

# COMPETITORS with GREEN solutions

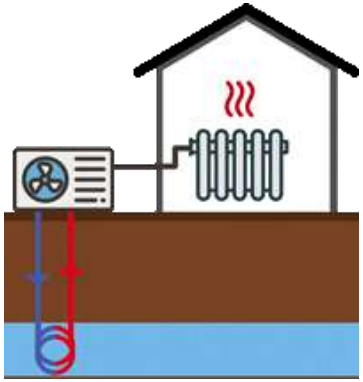
## ALTERNATIVE PRODUCTS TO OUR SYSTEMS



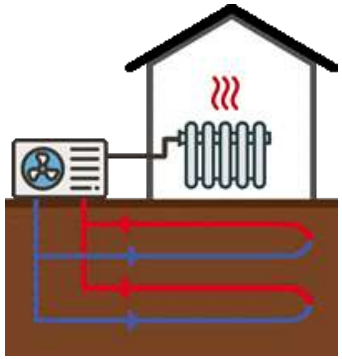
HEAT PUMP air > air



HEAT PUMP air > water

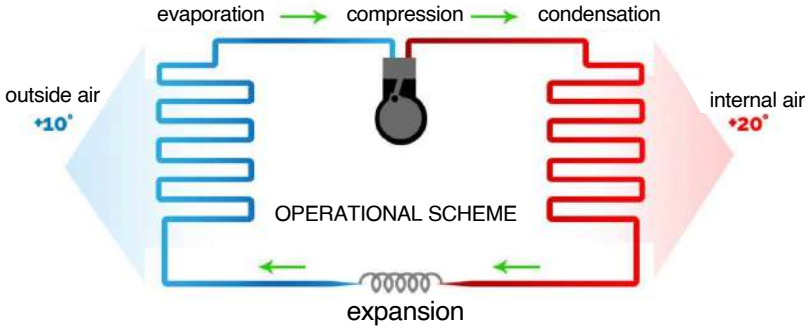


HEAT PUMP water > water (geothermal)



HEAT PUMP ground > water (geothermal)

POWERED BY ELECTRICITY




The ADVANTAGES of HEAT PUMPS are:

- environmental sustainability
- efficient performance (ratio between thermal energy produced in kW and the electrical power absorbed in kW is equal to 1: 2 <-> 1: 4)
- possibility of heating and cooling environments

NEED for:

- presence of specific spaces (they are noisy and require rather large spaces --- they are usually installed outdoors)
- availability of natural sources (that water > water requires a suction well, that earth > water requires a free area of land)
- interventions on the heating system (on the one already installed or creation of a new system)
- maintenance and installation interventions that are not always simple

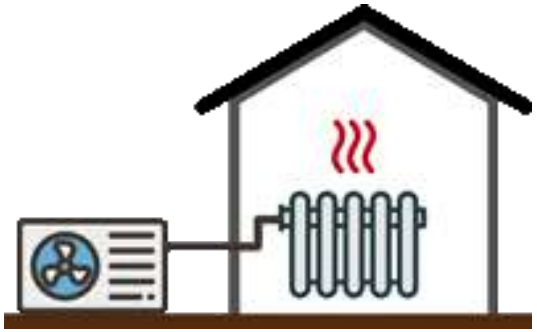
The overall cost of installing and putting a heat pump into operation varies from a minimum of 5K€ to a maximum of 9/12K€ (geothermal)

In 90% of cases, it is a valid option if combined with the use of photovoltaic panels (return on investment x lower costs of energy sources) + minimum quota of electricity to be used. There are currently Bonuses (tax deductions) of 65% in Italy

To heat the rooms and the sanitary water of a house of 80 m2, ON AVERAGE, at least 3 kW/h of electrical power per day is required.

# COMPETITORS with GREEN solutions

COMPARISON



HEAT PUMP air > water



Data collected from 2013 to today with respect to the average daily energy consumption of our test home

*Example: 120m2 home - 4 people*

Both solutions:
- need to have at least 4.5 kW/h of electrical power
- same thermal efficiency

Heat pumps:
- need for outdoor space for installation
- noise and maintenance requirements
- possibility of cooling the rooms

E'A Products:
- NO
- NO
- NO

EXISTING BUILDINGS of historical character or in rural or mountainous areas that do not have room heating systems and only boilers for sanitary water

Heat pumps:
- NOT installable due to lack of space and/or noise

E'A Products:
- Boiler
- Wall heating panels
- Stoves

*The limited thickness of our resistive modules, allows their use in renovation work*

EXISTING BUILDINGS that can REUSE the heating and hot water systems

Heat pumps:
- purchase of the machine
- connection/modification work to existing systems

E'A Products:
- Higher costs for the replacement of existing systems

EXISTING BUILDINGS that need to REPLACE the heating and hot water systems

NEW BUILDINGS with NEW heating and water systems

Heat pumps:
- purchase of the machine
- installation work of the new systems

E'A Products:
- NO
- similar costs for installation work of the heating modules and the boiler