


PITAGORAS

Many thank for your attention

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SUSTAINABLE URBAN  
PLANNING WITH  
INNOVATIVE AND LOW  
ENERGY THERMAL AND  
POWER GENERATION  
FROM RESIDUAL AND  
RENEWABLE SOURCES

PITAGORAS

 This project has received funding from the European Union's Seventh Programme for research, technological development and demonstration under grant agreement No 314596

 Inspiring Business

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 ORIP

## WHAT IS PITAGORAS?

Efficient integration of city districts with industrial parks through smart thermal grids.

### OBJECTIVE

To demonstrate a highly replicable, cost-effective and high energy efficiency large scale energy generation system that will allow sustainable urban planning of very low energy city districts.

### INDUSTRY

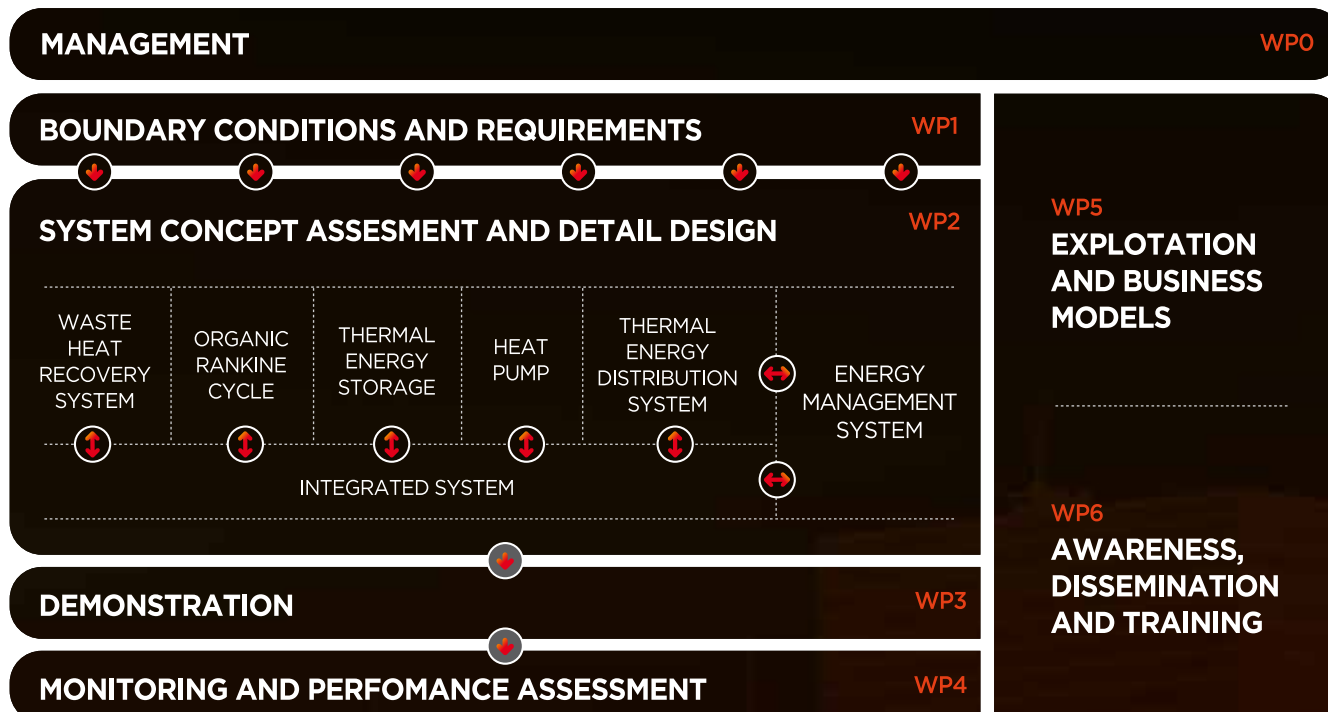
from energy consumer to **ENERGY SUPPLIER**

## FRAMEWORK AND SCOPE

Technologies and concepts for low and medium temperature waste heat recovery and heat (and power) supply to cities will be developed and demonstrated. Involved systems and concepts (to be optimised in the framework of the project):

- Waste heat recovery system
- Organic Rankine Cycle for heat and power generation
- Seasonal thermal energy storage system
- Integration with high efficiency heat pumps
- Solar thermal energy
- Integration of new technologies, concepts and systems developed and state-of-the-art systems
- Innovative tools for efficient energy management at component, building, district and city level

## HOW WE WILL DO IT? WORK PACKAGES



## IMPACT

### In the USA:

- The total energy consumption is 78 quads (1 quad = 293 x 10<sup>9</sup> kWh)
- The industrial sector consumes 28 quads
- The waste heat energy discharged is 11 quads. The industrial waste heat amounts to 14% of US total energy consumption and 39% of the industrial energy consumption.

### In Europe:

The percentage of available waste heat in industry in Europe is close to that in the USA.

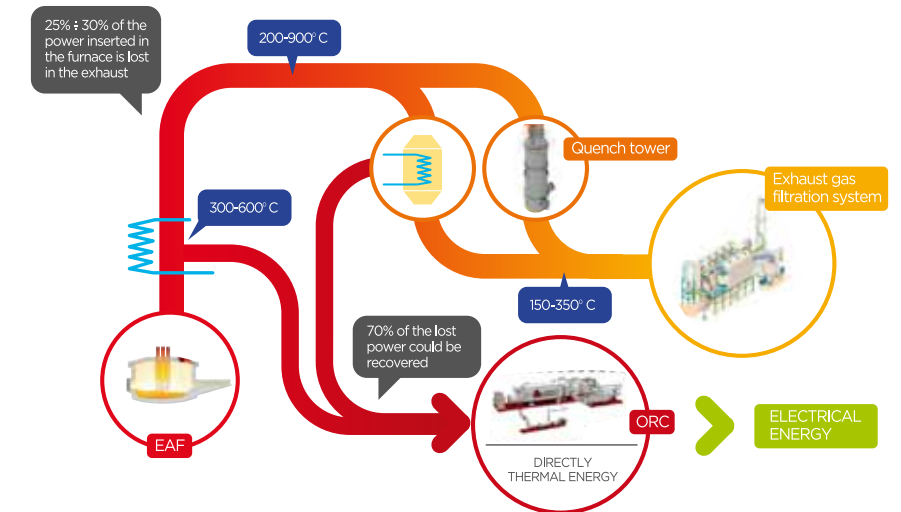
European industry generates annually approximately 4,000 TWh of waste heat, which is equivalent to the incident solar radiation in 3,300,000 Km<sup>2</sup> (approx. 1/3 of the total area of Europe).

## LOCAL IMPACT



### ITALY BRESCIA

The demonstration plant will be implemented in the steel foundry owned by ORI MARTIN. The waste heat recovery system will be implemented into the flue way and an ORC unit for approximately 2,1 MW (electrical capacity) will be installed for heat and power generation. Heat will be delivered to the existing district heating network.



### AUSTRIA KREMSMÜNSTER

The demonstration plant in the city of Kremsmünster will have a STES system of about 60,000 m<sup>3</sup> that stores the waste heat from industry and the heat produced by the solar thermal plant (appr. 10,000m<sup>2</sup>).

