Application of Solar Thermal Energy to Processes

Fact Sheet

<table>
<thead>
<tr>
<th>Project Information</th>
<th>Funded under</th>
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<tr>
<td>ASTEP</td>
<td>H2020-EU.3.3.2.</td>
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<tr>
<td>Grant agreement ID: 884411</td>
<td>H2020-EU.3.3.1.2.</td>
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<td>Start date</td>
<td>End date</td>
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<tr>
<td>1 May 2020</td>
<td>30 April 2024</td>
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<tr>
<td>Overall budget</td>
<td>€ 4 999 360</td>
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<td>EU contribution</td>
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<td>Coordinated by</td>
<td></td>
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<tr>
<td>UNIVERSIDAD NACIONAL DE EDUCACION A DISTANCIA</td>
<td>Spain</td>
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Project description

Industrial process heating using solar energy

Heating for industrial processes accounts for most of the manufacturing sector’s energy demand. However, current heating systems have a number of limitations, such as the use of fossil fuels. The EU-funded ASTEP project aims to overcome these drawbacks by developing a novel solar heating for industrial processes (SHIP) concept. It will combine a rotary Fresnel solar collector and a thermal energy storage based on PCM with passive and active heat transfer enhancement techniques, which will be integrated through a control system to maintain continuous service. This innovative system will be able to cover a significant proportion of the process...
industry’s heat demand at temperatures and latitudes where current designs have failed. The project will provide a competitive alternative to fossil fuel consumption.

**Objective**

Application of Solar Thermal Energy to Processes (ASTEP) will create a new innovative Solar Heating for Industrial Processes (SHIP) concept focused on overcoming the current limitations of these systems. This solution is based on modular and flexible integration of two innovative designs for the solar collector (SunDial) and the Thermal Energy Storage (TES, based on Phase Change Materials, PCM) integrated via a control system which will allow flexible operation to maintain continuous service against the unpredictable nature of the solar source and partially during night operation. ASTEP will demonstrate its capability to cover a substantial part of the heat demand of the process industry at temperatures above 150 °C and for latitudes where current designs are not able to supply it. Its modularity and compactness will also enable easy installation and repair with reduced space requirements, while most of components can be sourced locally. The ASTEP’s process integration will allow full compatibility with the existing systems of potential end-users of SHIP. These aspects will provide a very competitive solution to substitute fossil fuel consumption. The developed solar concept will be tested at two industrial sites to prove the objective’s target of TRL5. Life Cycle Analysis will be included to validate and demonstrate the efficiency of the proposed technologies. The first Industrial Site of the proposal is the world’s leading steel company, ArcelorMittal, with a heating demand above 220 °C for a factory located at a latitude of 47.1 N (Iasi, Romania). The second site is the dairy company MANDREKAS, located at a latitude of 37.93 N (Corinth, Greece) with a heating demand for steam at 175 °C and a cooling demand at 5 °C. These test locations will validate the ASTEP solution for a substantial part of the potential requirements of industrial heating and cooling demand of the European Union (EU28), which is estimated at approximately 72 TWh per year.

**Fields of science**

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> > >

**Programme(s)**

**Topic(s)**
## Call for proposal

H2020-LC-SC3-2019-NZE-RES-CC

## Funding Scheme

### Coordinator

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<tr>
<th>UNIVERSIDAD NACIONAL DE EDUCACION A DISTANCIA</th>
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<tr>
<td>Calle Bravo Murillo 38 Planta 7 28015 Madrid Spain</td>
<td>€ 718 750</td>
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Website [Contact the organisation](#)

### Participants (15)

#### DYNAMIC & SECURITY COMPUTATIONS SL

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<th>Spain</th>
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<td>€ 268 906,25</td>
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Camarena 177 Local 28047 Madrid

Contact the organisation [Contact the organisation](#)

#### VERTECH GROUP

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11 Rue Deffy 06000 Nice

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<td>UNIVERSIDAD POLITECNICA DE CARTAGENA</td>
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<td>€ 363 625</td>
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<td>Higher or Secondary Education Establishments</td>
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<tr>
<td>REAY DAVID</td>
<td>United Kingdom</td>
<td>€ 483 125</td>
<td>84 Monkseaton Drive NE26 3DG Whitley Bay Tyne &amp; Wear</td>
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<tr>
<td>EBOS TECHNOLOGIES LIMITED</td>
<td>Cyprus</td>
<td>€ 277 500</td>
<td>Arch. Makariou Iii And Mesoarion 1 Office 101 2322 Nicosia</td>
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<tr>
<td>BRUNEL UNIVERSITY LONDON</td>
<td>United Kingdom</td>
<td>€ 395 133,75</td>
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<td>Higher or Secondary</td>
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CROWDHELIX LIMITED
Ireland
EU contribution
€ 238 125
Address
Trinity House 7 Georges Quay
T12NAX0 Cork
Activity type
Private for-profit entities (excluding Higher or Secondary Education Establishments)

PRODUCTION TRADE AND SUPPORT OF MACHINABLE PRODUCTS OF SOFTWARE AND INFORMATICS - RELATIONAL TECHNOLOGY AE
Greece
EU contribution
€ 122 500
Address
Pisistratou Odos 52 Kalithea
17674 Athina
Activity type
Private for-profit entities (excluding Higher or Secondary Education Establishments)

UNIVERSIDAD POLITECNICA DE MADRID
Spain
EU contribution
€ 704 312,50
Address
Calle Ramiro De Maeztu 7
Edificio Rectorado
28040 Madrid
Activity type
Higher or Secondary Education Establishments

ARCELORMITTAL TUBULAR PRODUCTS IASI SA
Romania
EU contribution
€ 241 972.50
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<td>Marathonos 19Th Km 19009 Pikermi</td>
<td>Research Organisations</td>
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<td>Wybrzeze Wyspianskiego 27 50-370 Wroclaw</td>
<td>Higher or Secondary Education Establishments</td>
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<td>Calle Velazquez, No 94 Primera Planta 28006 Madrid</td>
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GALAKTOKOMIKA MANDREKAS ANONYMI ETAIREIA

Greece

EU contribution

€ 195 375

Address

80Th Klm New National Road
Athens Corinth
20100 Corinth

Activity type

Private for-profit entities
(excluding Higher or
Secondary Education
Establishments)

Contact the organisation [🔗]

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