

INFERNO, A NEW HORIZON EUROPE PROJECT

INDUSTRIAL WASTE HEAT TO BE TRANSFORMED INTO SUSTAINABLE ENERGY SOLUTION

(Cork, IE - August 2024) INFERNO - GA number 101160642 - is a Horizon Europe project led by six partners from three European countries that aims to develop a new system that will contribute to energy harvesting from industrial waste heat.

Global energy-intensive, high-temperature processing industries such as cement, steel and glass are losing more than 50% of their energy as waste heat during production. This amounts to approximately 400 TWh of power each year, which is almost one seventh of the total European electrical power demand. Despite the availability of technologies to convert waste heat into electricity, the adoption of these solutions at an industry scale has been poor.

INFERNO is tackling specific barriers such as efficiency and cost of renewable technologies, with the aim of developing a new hybrid platform system based on the integration of solid-state devices. This development will significantly contribute to sustainable energy harvesting from industrial waste heat.

The project consortium is led by Tyndall National Institute based at University College Cork (IE), in collaboration with Technological University Dublin (IE), Fraunhofer Institute for Solar Energy Systems ISE (DE), IFW Dresden (DE), Université de Technologie de Troyes (FR), and F6S Innovation (IE).

This collaboration between European experts in materials research, modelling, cell fabrication, thermoelectricity, and electronics, aims to develop new materials and systems for thermal power to electricity conversion. Development efforts target improvements regarding infrared sensitive low bandgap thermophotovoltaic cells, photonic metamaterials, as well as high-performance thermoelectric generator devices made of earth-abundant materials. Thermophotovoltaics is the direct conversion of radiant power into electricity using the photovoltaic effect, whereas thermoelectrics is using temperature gradient into electricity using Seebeck effect.

This development will allow this new waste heat recovery system to operate over a wider range of temperatures, from 400 to 800 °C, at least 25% more efficiently than the current state of the art systems. The primary advantage of the new system is its modularity without involving any major moving parts.

The INFERNO project will deploy a modular, hybrid energy harvesting system that can be easily integrated into production lines, helping hard-to-decarbonise industries improve their system efficiency and reduce greenhouse gas emissions. Three pilot demonstrations in Ireland, Germany and France will test the integrated hybrid system and its components.

For more information about the INFERNO Project please visit:
<https://infernoproject.eu>

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