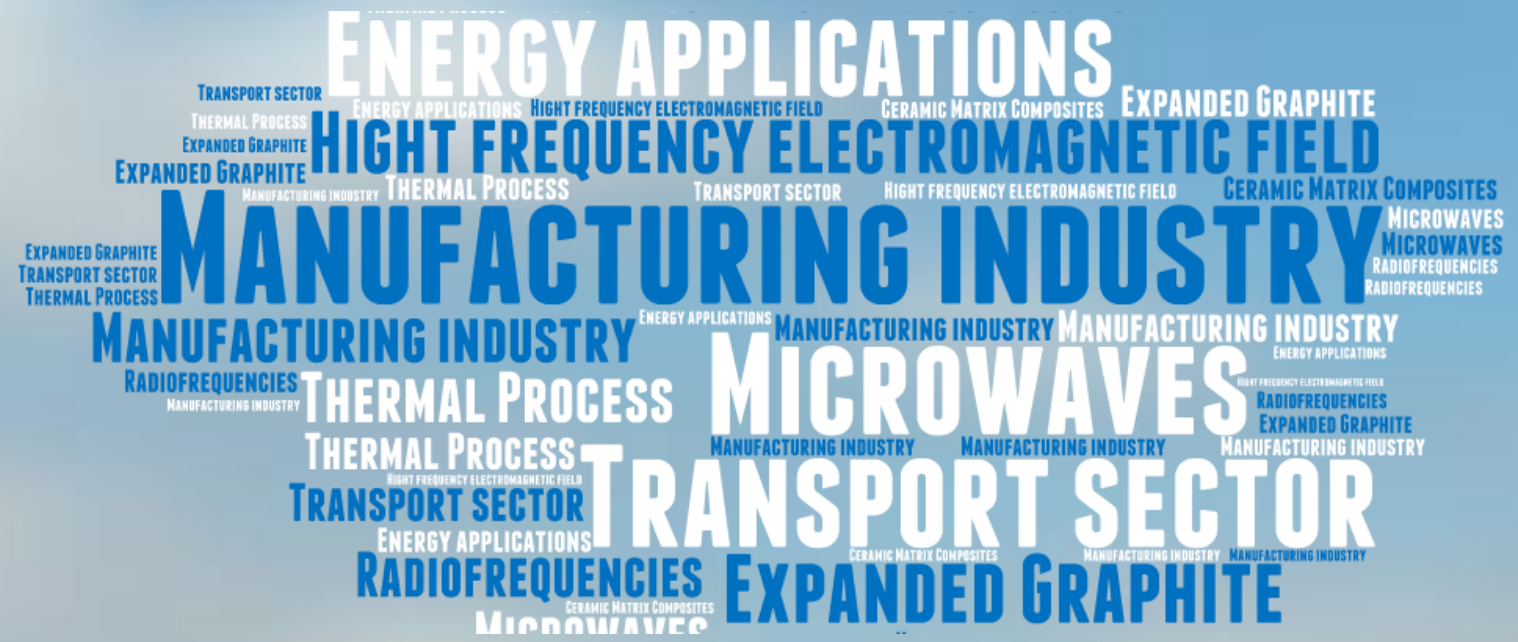




SUPPORTED BY THE EUROPEAN COMMISSION



High-frequency **E**lectro-**M**agnetic technologies for advanced processing of ceramic matrix composites and graphite expansion



PROJECT DETAILS



PROJECT COORDINATOR

Andrea Lazzeri

a.lazzeri@ing.unipi.it

Tel: +39 0502217807 Fax: +39 0502217903

PROJECT MANAGER

Isella Vicini

isella.vicini@warrantgroup.it

Tel: +39 051 9840863 Fax: +39 051 9840885

DISSEMINATION MANAGER

Cinzia Iacono

cinzia.iacono@warrantgroup.it

Tel: +39 051 9840863 Fax: +39 051 9840885

GRANT AGREEMENT NO.: 280464

PROGRAMME ACRONYM: FP7-NMP

TOPIC: *NMP.2011.4.01 New technologies based on physical processing of materials for mechanical or electrotechnical applications*

START DATE: June, 1st 2012

END DATE: May, 31st 2016

EU CONTRIBUTION: 7,151,000 €

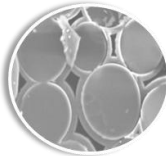
TOTAL COST: 10,285,626 €

CONCEPT

- **Advanced processing technologies** based on **high-frequency electromagnetic waves (MW and RF)** for thermal processing/treatment of



Ceramic Matrix Composites (CMC) carbon (C) or silicon carbide (SiC) fibre reinforced composites (C/SiC or SiC/SiC)



Expanded Graphite (EG)

- CMC and EG represent the latest and most promising solutions for **high temperature applications** in the manufacturing industry, in the **transport sector** and for new **demanding energy applications**.
- Lightweight CMC are priorities of EuMAT ETP Strategic Research Agenda and a key issue of the EC Research Roadmap on Materials for Horizon 2020.

PARTNERS



METHODOLOGY AND OBJECTIVES

HYBRID THERMAL/MW ASSISTED CHEMICAL VAPOUR INFILTRATION-CVI TECHNOLOGY

- manufacturing time reduction of CMCs by a factor 10
- cost-effective process route to build up the SiC matrix in 2D or 3D fibre performs.

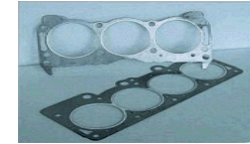
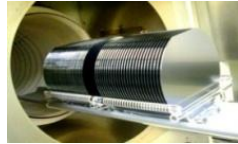
POLYMER IMPREGNATION AND PYROLISIS-PIP PROCESSES BASED ON

- conventional MW heating,
- MW and RF frequency combination , and RF

MW FURNACES FOR LIQUID SILICON INFILTRATION-LSI, GRAPHITE EXPANSION

- process time reduction by 15% to 60%
- energy saving of about 50%

INDUSTRIAL APPLICATIONS



CVI



LSI
AND
GE



PIP

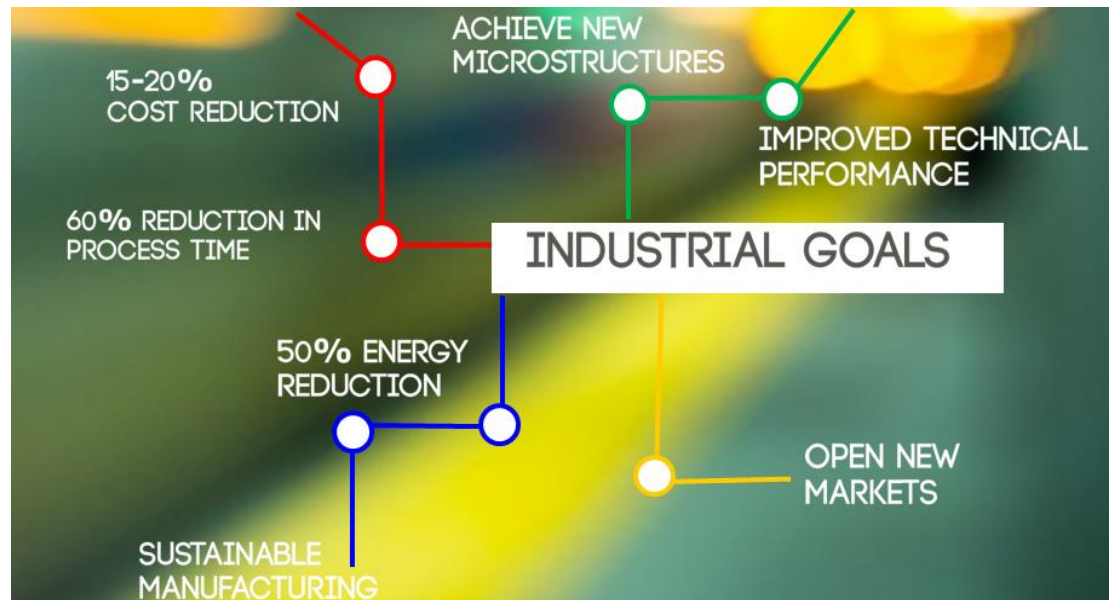


INDUSTRIAL GOALS

HELM IS ABSOLUTELY STRATEGIC FROM THE INDUSTRIAL POINT OF VIEW

Global market requires **higher performance products at lower cost** all together with a **sustainable manufacturing approach**

European industries need new technical solutions in order to remain competitive, they need to **save energy**, **reduce processing time** and **cut production cost**



VISIT HELM WEBSITE

www.helm-project.eu



CONTACT US

info.helmfp7@gmail.com

This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no. 280464.