After Life

Communication Plan

Pilot Demonstration Plant for no-melt manufacturing process of Mg part
RESULTS OF THE GREEN METALLURGY PROJECT

The project consisted in building a pilot plant for the manufacturing of semifinished bars ready for secondary superplastic operations to realize Mg-based lightweight parts for automotive by the lowest environmental impact currently known in literature for magnesium alloy.

A HIGHLY INNOVATIVE and CLEAN PROJECT

In the Green Metallurgy project a demonstrative plant integrating innovative materials and low-energy and free-greenhouse gases process that is unique in the World have been built and tested.

SOCIAL AND ECONOMICAL BENEFITS

The Green Metallurgy technology can employ a highly integrated recycling process that can use up to 100% of recycled Eco-Mg chips. The Eco-Mg chips are not affected by high reactivity with oxygen as conventional magnesium alloys. Furthermore the GM process is conducted in no-melt regime and any protective gases are avoided. These two key points are relevant for the workers’ health. No accidental contact with gases is necessary, no risks of accidental explosions exist because of non-reactivity of Eco-Mg chips with oxygen.

A TECHNOLOGY EASY TO REPLICATE

The highly scalability of the machine realized, the clear positive impact on environment - and work condition in general-, the high marketability of solution researched, the high stability of material costs provided by integrating material recycling are all keys for the success of implementation of project outcomes by companies that are involved/interested in manufacturing of automotive lightweight components. The continuous request of high performance light-weight materials would push the long term research on the GM project outcomes. Particularly, further researches should focus on demonstrating feasibility to produce nanostructured BAS materials mixing BAS recycled chips with varying percentage of virgin BAS atomized powders. This implies a consistent reduction of the current high costs of the BAS material, too much high to compete in automotive sector.
THE PROJECT IS HIGHLY RELEVANT TO THE EUROPEAN ENVIRONMENTAL POLICY AND LEGISLATION

The project is in concordance with the European environmental policy particularly for the directive now in discussions that are related to stringent CO2 emissions for future vehicle and policy strategies related with reduction of virgin material sourcing for industry sector thus promoting recycling materials. Higher recycling targets to drive transition to a Circular Economy with new jobs and sustainable growth are the main goal of legislative proposals that are going to passing to the Council and the European Parliament. Such a target is to be considered in the context of the mid-term review of the Europe 2020 Strategy (source: http://europa.eu/rapid/press-release_IP-14-763_en.htm).

THE FUTURE COMMUNICATION STRATEGY

Different activities have been carried out aimed at disseminating the project know-how and making possible its transferability. The beneficiary and the partner of the project will continue working on the dissemination task.

The LINKEDIN Group tool

A Linkedin group will be voluntarily created to implement in circulation among company, professionals, policy makers etc. relevant information and updated participation to conferences where future outcomes of project will be discussed.

Future dissemination of the project results at international and national level.

A paper for next World Conference TMS 2015 will be submitted within 2 July 2014 to show the deployment of concrete outcome results of the project. Below the title and abstract of the paper.

Title: Comparative environmental benefits of lightweight design in the automotive sector: the case study of recycled magnesium against CFRP and aluminum

Authors: Fabrizio D’Errico, Luigi Ranza, Presenter: Fabrizio D’Errico

Abstract: A LCA feasibility study was undertaken to determine the environmental impact of an Eco-magnesium process route by recycled chips to manufacture panel for automotive sector to be compared with three comparative scenarios, a non-recycled carbon fiber reinforced polymer (CFRP), a recycled CFRP and an aluminum alloy and a baseline steel-made component scenario. The objective of this LCA study was to assess actual benefits of lightweight solution considering the whole life cycle, including the dirty-phase (i.e. the “cradle-to-exit gate” stage) that impact differently for the different materials. To this scope the analysis has regarded the net “cradle-to-grave” scenario. Different automotive floor pans have been thus compared considering the rate of fuel consumption during vehicle operation - i.e. the fuel-
mass correlation factor - and the different material substitution factors allowed by different materials selected.

**Continuing Participation to the Technical Magnesium Committee of TMS**

As important opportunity of being linked with people from industry that have relevant position in R&D departments of Governative Bodies and industries in the automotive and aeronautics sector, the project coordinator intends to continue in his role of member of Magnesium Technical Committee since the appointing on the TMS 2011 Conference. The aim is to continue in promoting manufacturing processes that follow process pathway with high recyclability content, as demonstrated by GM project.

**Deadline:** Annual  
**Sources:** Fabrizio D'Errico, project coordinator, POLIMI.

**Demonstration seminars.**

The beneficiary will invite formally these companies, and will provide seminars where the pilot plant is explained while it's functioning in the factory in Viernheim, GER.

**Deadline:** periodically, depending on the requests.  
**Sources:** BUH personnel.

**Publications in magazines.**

Production of articles for publications in vast audience journals as the JOM journal is planend.

**Deadline:** periodically depending on main topic of journal  
**Sources:** Polimi personnel.
LIFE09 ENV IT 117

Politecnico di Milano
Piazza Leonardo da Vinci 32
20100 Milano, Italy

Agencia Estatal Consejo Superior de Investigaciones Científicas
Centro Nacional de Investigaciones Metalúrgicas
Avenida Gregorio del Amo 8, 28040, Madrid, Spain

Bühler Druckgiessysteme GmbH
Grosser Stellweg 16, Viernheim, Germany

www.green-metallurgy.eu