Techno-economical design and pilot production of advanced and high added-value materials from rice husk ash

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INFORMATION ON THE ECO-INNOVATIVE SOLUTION PROVIDER

This eco-innovative solution is the output from the project titled "Techno-economical design and pilot production of advanced and high-added value materials from rice husk ash" co-funded by the European Commission within the framework of the Competitive and Innovation Program. This solution has been developed by a team coordinated by Prof. V.G. Papadakis , AGRINO S.A.

SHORT DESCRIPTION OF THE ECO-INNOVATIVE SOLUTION

Rice husk ash (RHA) is the solid residue of the incineration of the rice husk, a process used for steam and energy production in the rice industry. The innovation consists of a process to convert this waste material (RHA) into high added-value derivatives such as insulators (tundish ash), pozzolans (similar to silica fume for use in construction sector) and zeolites. The main benefits include the transformation of dangerous substances into useful and marketable materials that significantly reduce the amounts of hazardous wastes that have to be disposed of

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INDUSTRIAL SECTOR – MARKET SEGMENT AND ACTUAL APPLICATION IN INDUSTRY

20 Food and Kindred Products

INDUSTRIAL CLASSIFICATION - NACE CODE;

10 Manufacture of food products

1.DESCRIPTION OF ECO-INNOVATIVE SOLUTION

Technical aspects of the eco-innovative solution

The main innovation consists of a process to convert substances that are classified as hazardous waste, into pozzolans and tundish ash. The technology does not need additional equipment for the tundish ash solution, but focuses mainly on changes in the combustion process. Depending on the combustion temperature, the pressure and the burning time, it is possible to convert rice husk ash into high value-added materials. Although the final material depends to a large extent on the rice quality and the burner installed, it is possible to implement the process in an existing plant. The outcome, a raw material used as insulation material, is already applied in the automotive industry, mainly to protect shaped metals from heat. The material can therefore be used by companies supplying highly formable insulation materials. Pozzolan production in the other hand, requires the purchase of a vibrating mill, that is able to achieve a sub-micron fineness. Finally, it is possible to develop zeolite materials, but this conversion requires the development of an entirely new chemical plant. Zeolite conversion is protected by a Greek patent, whereas the other solutions are not covered by patents.

Economic and environmental benefits of the eco-innovative solution

The recommended size for an existing plant should exceed 500t/year input/output (rice husk ash) with estimated fixed cost of 200,000 €. Investments for a plant with a throughput of 4000t/yr are given at 500,000€, payback 7 years, in the case of production of both tundish ash and pozzolan. Economics depend to a large extent on the reduced landfill costs, which in the case of Greece are 40€/t, and the revenues from the sales of the tundish material which range from 70€/to –140€/to, depending on the quality.

2. AVAILABILITY OF THE ECO-INNOVATIVE SOLUTION AND BUSINESS PARTNERSHIP

Market readiness, Trade mark, existing market coverage, commercialization strategy

Two plants currently operate in Greece (inside a rice plant). Construction material producers use the derivatives in their existing plants for the manufacturing of insulation materials and for cement in Italy and Germany. There is no trade mark available

Requirements to adapt the solution to the local market and potential applications/market size

The innovation consists of the modification of an existing plant. State of the art processes need to be in place.

On-site after-sales services support and the technical assistance requirements

Technical support is provided from Greece.

Targeted local business partners

Engineering company supplying rice milling plants

Type of local business partnership sought

Licensing

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