Deliverable C 3-1

Environmental Impact Assessment: report on the environmental performance of LIFE DIANA technology

This deliverable is a product of Action C.3 “LCA/LCC analysis”. To conduct the LCA analysis it was first necessary to review the current literature in respect with oil sludge management treatment technologies as well as the relevant life-cycle methodologies and guidelines that are dedicated to oil waste management applications. It was an important step in order to identify differences between available technologies and also to collect data to ensure the reliability of this study. Deeper investigation into the results was performed in order to develop specific scenarios related to the criteria resulted by “business-as-usual” technologies, based on the data of literature. In this way, it was possible to compare the innovative DIANA technology with the other available technologies following the requirements of Grant Agreement and thus to identify which technology had the higher and lower impact on the outcome of the study. In addition to the above-mentioned actions, LCC analysis was also conducted in order to estimate the financial impact of the DIANA technology oriented to the development of a high-end product.

The LCA and LCC general overview as well as the corresponding framework (ISO and other pertinent standards) were also presented. Moreover, the LCA methodology applied in the current analysis considering the LIFE DIANA technology was overviewed. The Functional Unit was described. The Life Cycle Inventory (data collection) was thoroughly defined, while the Assumptions and Limitations were also mentioned. The definition of Scenarios (case studies) for testing and modelling was made. The impact assessment for LIFE DIANA technology and “business-as-usual” practices was also performed.

The application of DIANA technology has resulted in the reduction of seven main impact categories (Ozone Depletion Potential - ODP, Global Warming Potential - GWP, Eutrophication Potential - EP, Human Health Cancer - CAR, Human Health Noncancer - NCAR, Ecotoxicity - ECT, Fuel Fossil Depletion - FFD) as well as Energy by 70% in comparison to the other “business-as-usual” practices. Moreover, DIANA technology resulted in the reduction of land use by 90% compared to the other techniques.

The current LCA/LCC analysis has proved that the application of Engineered Soil as a stabilization method for treating the refineries oil sludge affects positively the entire life cycle of the holistic process, compared to other relevant “business-as-usual” already available in market. For this reason, LIFE DIANA technology is promising and competitive regarding the sustainable environmental management of oil sludges resulted by petroleum refineries.