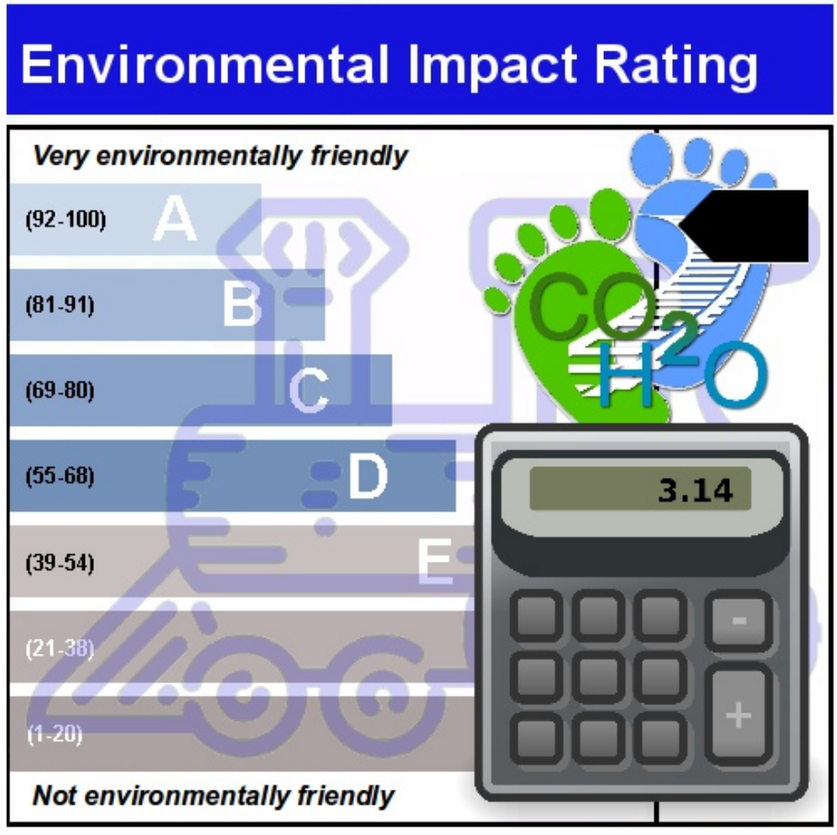
HUELLAS

European Project LIFE+

Newsletter



Issue 5 - June 2016

Inside

Briefing

- **Decision Support Tool**
- **Virtual Simulator**
- **News**
- **Agenda**

Editorial

LIFE HUELLAS tool has been released. It allows expert users to adjust project planning according to sustainability criteria. The tool allows project building and provides different planning alternatives for a railway infrastructure contruction project. Knowledge Base management functions are also included.

Results are shown in two-by-two comparison graphs, e.g. cost against environmental impact, cost against project length, etc.

At the same time, a Virtual Simulator has been published at LIFE HUELLAS website. This Open Access tool is available online, with all the information regarding LCA and Social LCA (SLCA). LIFE HUELLAS Virtual Simulator is intended for spreading the word on sustainable development and promote the incorporation of environmental criteria on construction projects. This kind of tools pave the way for the use of this or similar tools for public bodies or bidders.

A full scientific paper has been submitted and accepted for publication on EnviroInfo 2016, a conference on leading environmental ICT, so project outcomes will be presented to experts from industry, research and education.

Gregorio Sainz Palmero
LIFE HUELLAS Coordinator
Fundacion CARTIF

LIFE HUELLAS Project Update:
Sustainability Decision Support Tool Released

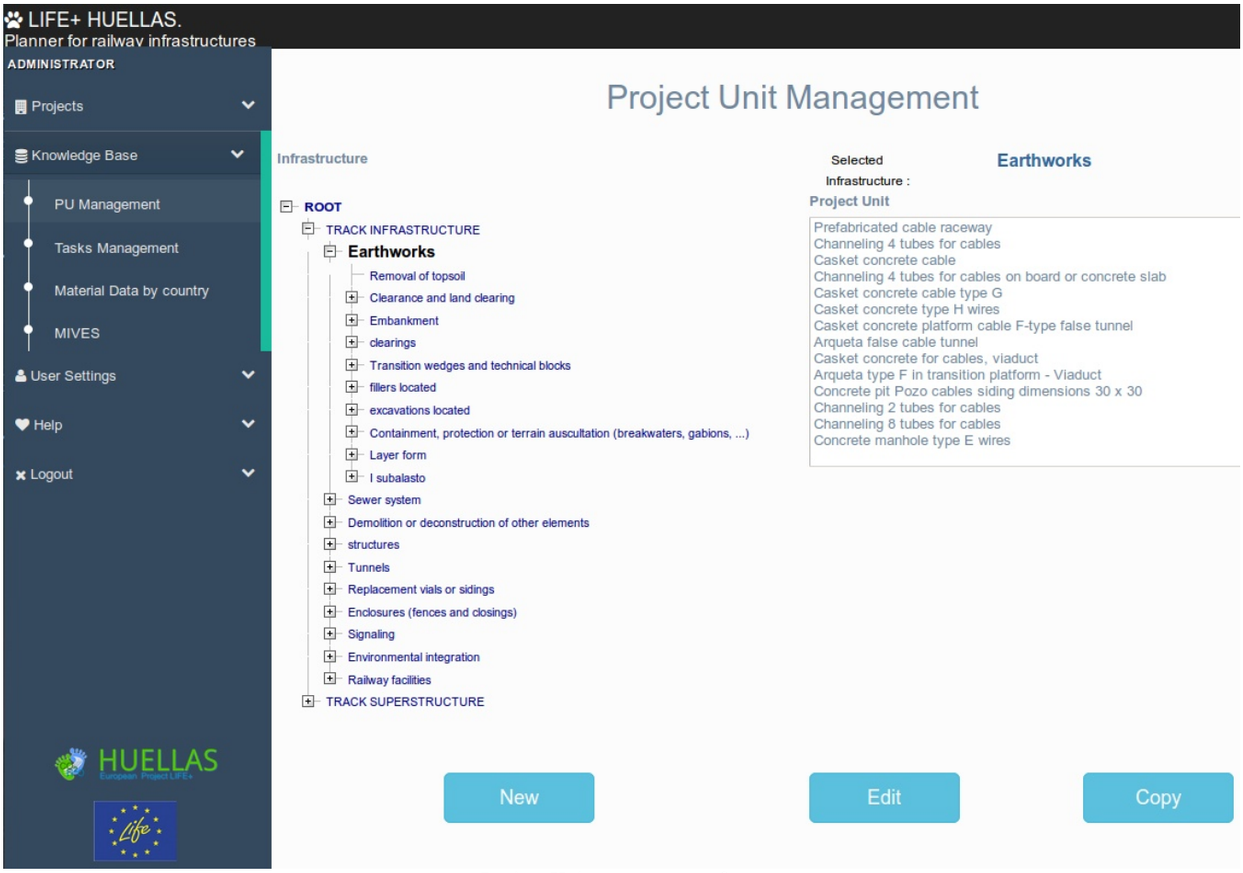
Railway infrastructure construction projects are complex systems. Implementation of project units involve a multitude of decisions, from supplier selection to machinery or execution methods. The availability of a methodology to promote not only the calculation of the carbon and water footprints, but also the analysis of alternative project unit scheduling, will be a substantial boost in reducing emissions and impacts of railway infrastructures construction.

LIFE HUELLAS decision support tool is based on Multi-Objective Evolutive Algorithms (MOEA). Evolutive Algorithms (EA) are adaptive methods, generally used in problems of parameters search and optimization, based on the principle of survival of the fittest.

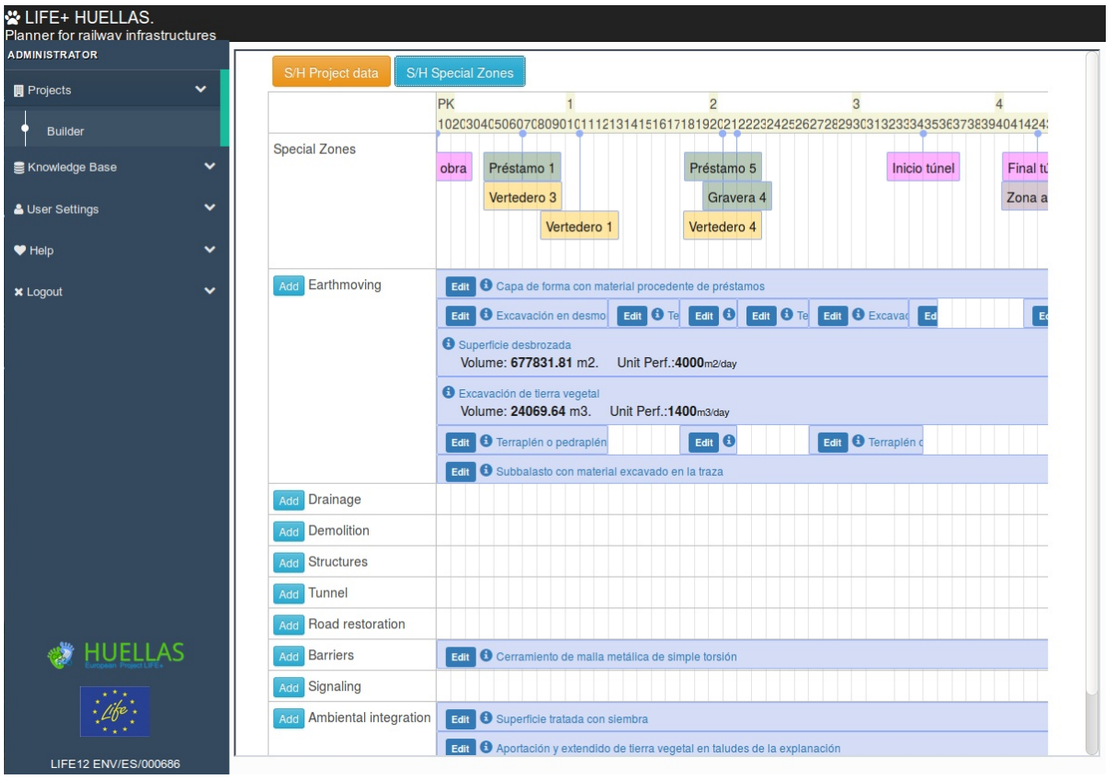
LIFE HUELLAS tool provides a Sustainability Index based on environmental, social and economic indicators.

Multi-objective programming can be considered as part of Operational Research. It seeks to provide efficient methods for decision-making on issues that include diversity of goals, that are evaluated according to multiple criteria and where the best or optimal solution is not evident. Real problems usually require finding solutions that simultaneously meet multiple performance criteria or objectives, which can be contradictory. When it is not feasible to combine the objectives of a problem properly, the problem is a Multi-objective Optimization Problem (MOP).

Multi-objective evolutive algorithms provide a set of non-dominated feasible solutions, i.e. satisfying all constraints, providing different execution alternatives for the rail infrastructure project being analyzed.

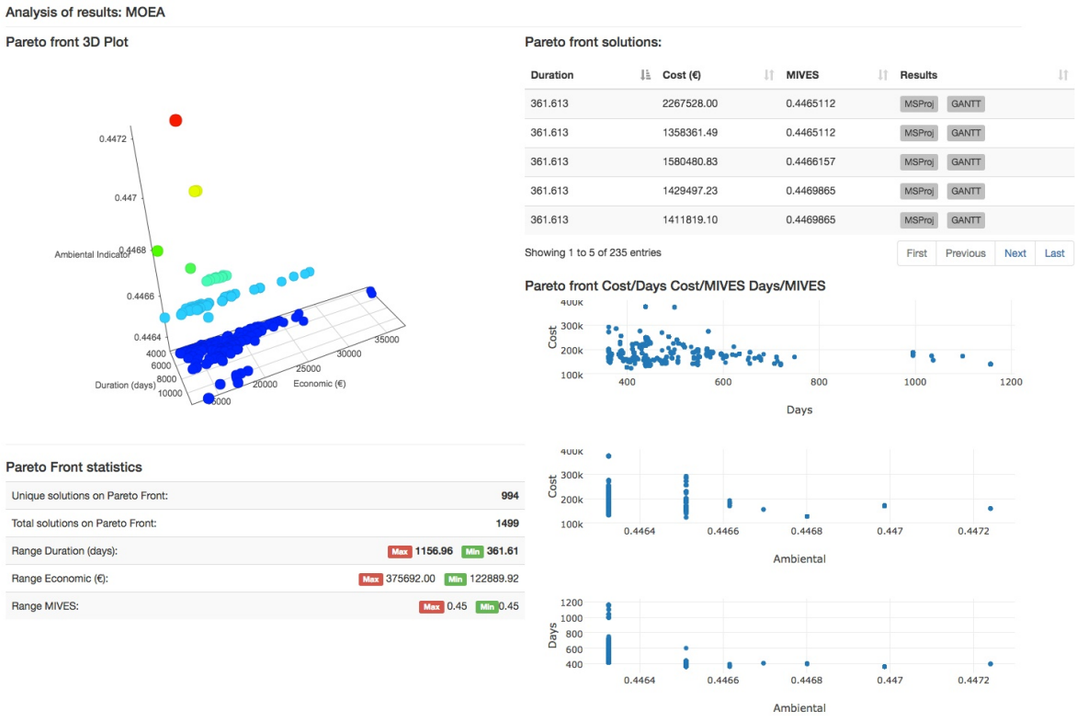


Project Unit management form.



Project builder and planner details.

A decision support system (DSS) has been developed as a web application. The user can select a project unit, assign the value and specify the kilometer points where the project unit will be executed. Once the project is completely defined, the tool will provide alternative solutions, with equivalent project units or different scheduling, optimizing project planning and environmental, social and economic impacts.



Results analysis screenshot.

LIFE HUELLAS Virtual Simulator:
An Open Tool for Footprints Calculation

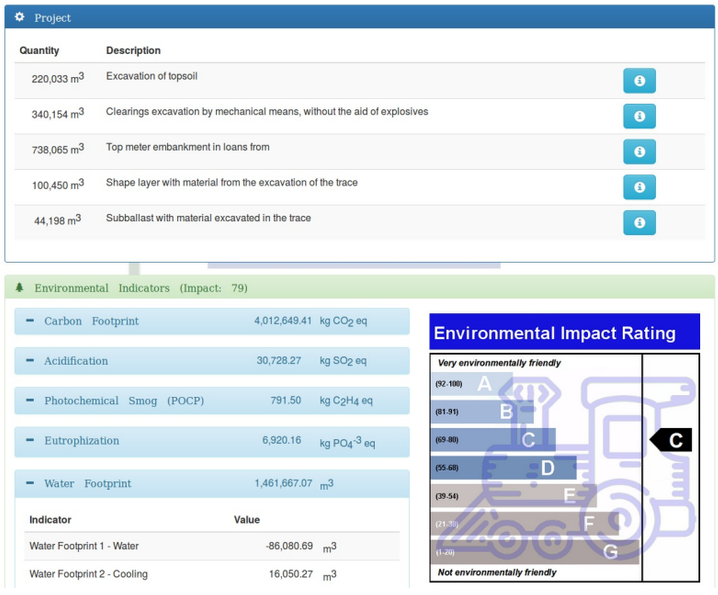
The *Sustainable Public Procurement Initiative* (SPPI) is nowadays the key policy instrument to promote sustainable development and move towards a green economy that fosters the development of products and services maximizing social and environmental benefits. The LIFE HUELLAS project seeks to promote the incorporation of environmental criteria for public bodies or bidders.

Specifically, rail transport causes 0.2% of global emissions in EU27. Infrastructure supposes 28% of these emissions, half of them caused during construction. This shows the high environmental impact of these activities.

LIFE HUELLAS Virtual Simulator home page.

Life cycle assessment (LCA) techniques combined with intelligent data analysis improves sustainability of railway infrastructure construction processes as a whole, considering environmental, economic and social aspects. The goal is to reduce carbon and water footprints of railway infrastructure construction projects from their earliest stages, i.e. design and planning processes.

Environmental and social impact of most relevant tasks have been reviewed and analyzed in order to set the impact of railway networks construction processes. Based on this information, a tool has been developed, providing selected specific footprint values and environmental & social indicators as open data to the community.



Project results on Virtual Simulator.

LIFE HUELLAS project has performed a threefold (environmental, economic and social) in-depth analysis of about 450 rail infrastructure project units, considering more than 520 tasks. For every item, 27 indicators have been calculated. Results have allowed the development of a series of environmental impact indicators. An open version of the tool, called "**Virtual Simulator**" is available online, with all the information regarding LCA and Social LCA (SLCA), prevailing the use of this or similar tools, in order to promote the incorporation of environmental criteria for public bodies or bidders.

NEWS

2nd Project Monitoring Meeting

Boecillo, February 2nd 2016

Another monitoring meeting of LIFE HUELLAS project was held with the presence of all project partners. The monitoring team has reviewed project progress, both technically and financially.

The aim of the project is that railway infrastructure construction companies become more sustainable. Therefore, an application based on life-cycle assessment and Intelligent Systems has been developed. This tool provides carbon footprint, water footprint and other environmental and social indicators of main railway infrastructure construction project units. A good practices manual will summarise project outcomes.

LIFE HUELLAS at 11th PTEC Forum

Barcelona, April 6th 2016

LIFE HUELLAS attended the 11th PTEC Forum: Innovation in Maintenance and Adaptation of Existing Transport Infrastructure to new demands. At the event, a total of 22 R&D and innovation projects related to transport infrastructure were presented, LIFE HUELLAS among them.

LIFE HUELLAS at Transport Research Arena (TRA2016): 6th European Transport Reserch Conference

Warsaw, April 18-21st 2016

Members of the LIFE HUELLAS Project consortium attended the Transport Research Arena 2016 (TRA2016) Conference, the most relevant transport research event at European level. Held every two years, it brings together major players in transport field: researchers, experts, operators, industry and public autho-rities.

The work being done in the frame of LIFE HUELLAS project was presented at the ses-sion "*Reducing the Transport Carbon Footprint*".

The congress also had plenary sessions, strategic sessions, technical sessions, workshops and other associated & side events, such as exhibition area and TRA Market-place.

With more than 2000 registered attendees, TRA 2016 is a unique event for dissemination of project results and contacting with stakeholders.

AGENDA

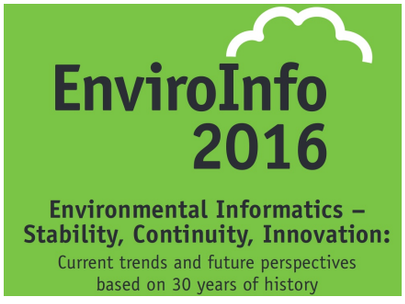
EnviroInfo 2016

Environmental Informatics Conf.

Berlin, September 13-16th 2016

LIFE HUELLAS will attend the EnviroInfo 2016 conference, the 30th edition of the long standing and established international and interdisciplinary conference series on leading environmental information and communication technologies. Combining and shaping national and international activities in the field of applied informatics and environmental informatics in making the world a better place for living, the EnviroInfo conference series aims at presenting and discussing the state-of-the-art development on ICT and environmental related fields.

The EnviroInfo conference series will be a retrospective on the experiences made and the lessons learned for a better valuation of current trends and future perspectives on its basic cross-cutting concerns like applications of geographical information systems, environmental modelling and simulation, risk management, material and energy flow management, climate change, tools and database applications and other aspects with regard to the main topic ICT and the environment.



One important goal of this conference is to bring experts from industry, research and education together to exchange ideas for solution of problems in the field on environmental protection and its IT-support.

LIFE HUELLAS Consortium

The LIFE HUELLAS project (Ref.: LIFE12 ENV/ES/000686, with the contribution of the European Union LIFE financial instrument), was granted in the framework of the 2012 Call of the LIFE+ European Programme. Project start date is October the 1st, 2013 and estimated project end will be on March 31st, 2017. Consortium is formed by:

- **Fundación CARTIF**: (Coordinator) Private, non for profit, research centre with 20 years of experience researching in energy, environment, ICT, agrofood, automation, robotics and computer vision areas. [1]

- **VIAS Y CONSTRUCCIONES S.A.**: Large construction firm with over 80 years' experience. Leader in railway infrastructure construction, it has been involved in every High Speed line deployed in Spain. [2]

- **Ingurumenaren Kideak Ingeniería S.L.**: Consulting firm specialized on industrial ecodesign, sustainable building and environmental technical training. It has been supporting companies and public bodies on environment innovation applied to products and services improvement since the year 2004. [3]

- **Universidad de Granada**: The research group "Soft Computing and Intelligent Information Systems" (SCI2S) is composed of a number of professors and researchers with widely recognized expertise in Soft Computing and Computational Intelligence fields. [4]

LIFE+ is the financial instrument of the European Union for the environment, with a budget of 2,143 M€ for the period 2007-2013. LIFE+ Projects include actions in the field of nature conservation, climate change, environmental policy and information and communication on environmental issues in all EU Member States.

References

[1] Fundación CARTIF, http://www.cartif.com.

[2] VIAS Y CONSTRUCCIONES, http://www.vias.es.

[3] IK-Ingeniería, http://www.ik-ingenieria.com.

[4] SCI2S - Universidad de Granada, http://sci2s.ugr.es.

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