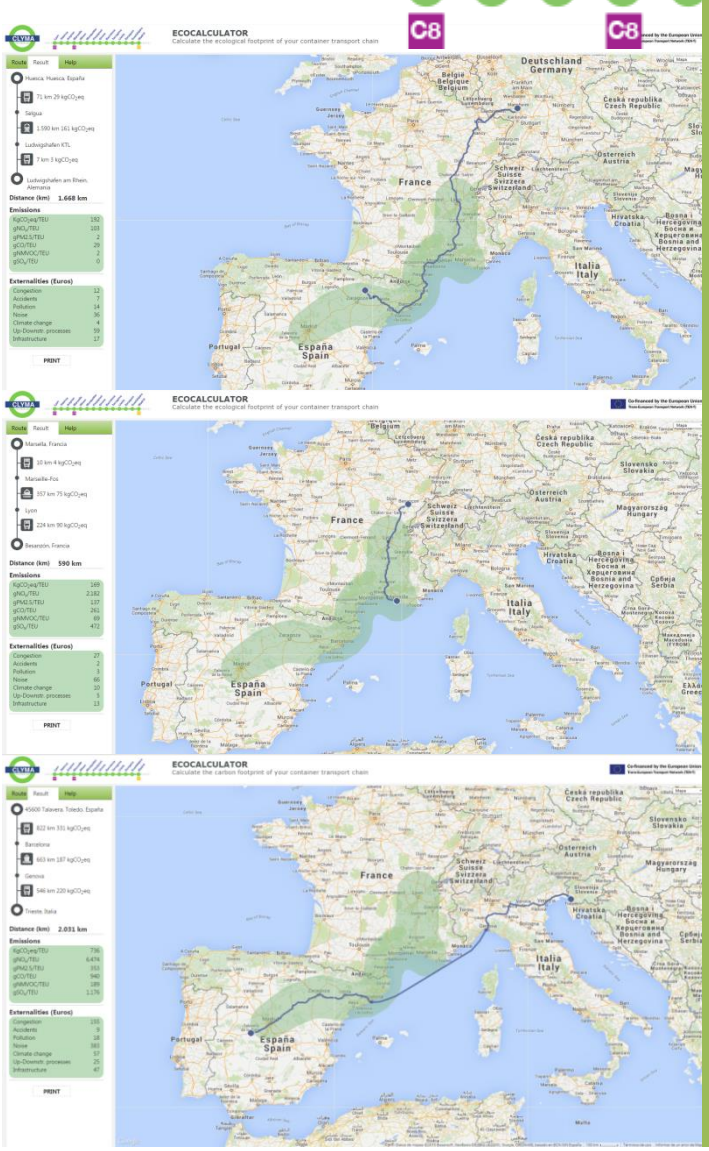
Lyon Valence Avignon Marseille Nîmes Montpellier Perpignan Girona Barcelona Tarragona Lleida Zaragoza Guadalajara Madrid

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# CLYMA ECOcalculator

## Estimate the ecological footprint of your container transport chain

The development of the concept of “green corridor” in the Lyon–Madrid axis of the Mediterranean corridor is one of the activities foreseen for the CLYMA project.

This activity includes the development of a web tool for calculating $CO_2$ emissions and other pollutants associated with a particular transport route that uses the CLYMA axis.

Using the tool is quite simple. It allows selecting the origin and destination of the transport chain, the main transport mode.- road, rail, fluvial or SSS- and assumes that first and last mile are always done by truck. As a result the tool calculates emissions and externalities of the whole transport chain.

TOOL DEVELOPED BY:
**MCRIT (2014)**

The web tool is accessible to the project’s Stakeholders Interest Group on the CLYMA website: **www.clyma.eu**

CLYMA
THE GREEN LINE

DEVELOPMENT OF THE
CONNECTION
LYON-MADRID
ON THE MEDITERRANEAN
CORRIDOR

Co-financed by the European Union
Trans-European Transport Network (TEN-T)

CLYMA
THE GREEN LINE
DEVELOPMENT OF THE CONNECTION LYON-MADRID ON THE MEDITERRANEAN CORRIDOR

## How it works

The web application is sequential, and follows these steps:

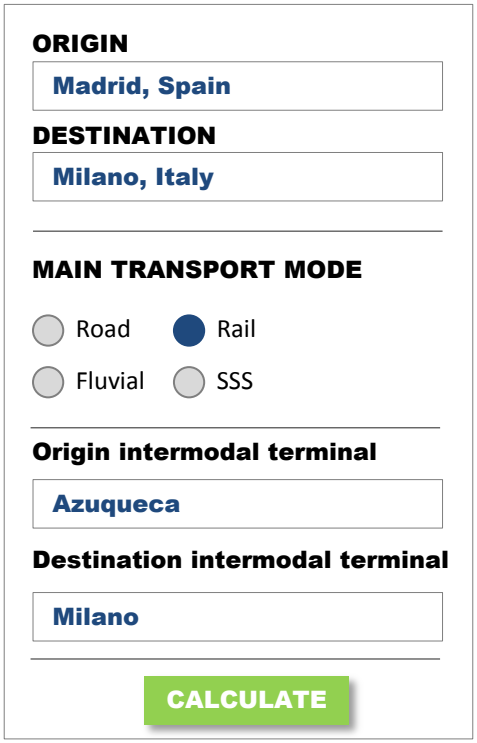
**ORIGIN**. Choose an European location entering an address or a city/village name.

**DESTINATION.** Choose an European location entering an address or a city/village name

**MAIN TRANSPORT MODE**. You can select an itinerary that takes place entirely by road or by rail/SSS/IWW, with the access / egress to these modes by road. If the mode selected is rail/SSS/IWW, first select the intermodal terminals at which you intend to switch between road and the main node. The system automatically provides the closest stations to the location selected for origin and destination.

**CALCULATE**. When you click on the "Calculate button" the system draws the optimal path on the map and shows a diagram with the basic data concerning distance and emissions.

**PRINT.** The system generates a summary report of the results of the simulation, which includes a map with the route and the results for emissions and externalities.




**The CLYMA ECOcalculator is linked to a Geographic Information System,** called SIMPORT, the Port of Barcelona's Information and Modelling System.

SIMPORT makes it possible to **calculate distances and trip duration for the various possible itineraries between European regions (NUTS3).** The distances are then used to calculate $CO_2$ emissions, other pollutants and transport externalities by **applying emission factors and load factors for each vehicle.**

Only the emissions associated with the journeys undertaken in the different modes are calculated. The system does not take into account the emissions from cargo handling, or the production of vehicles and infrastructures of transport.

*The tool serves the purpose of analysing transport routes using the CLYMA corridor and is limited to Europe. When using the tool be aware of the following:*

- *Some addresses or locations outside the influence area of the corridor cannot be selected.*
- *If the route to be calculated does not use any infrastructure belonging to the CLYMA axis influence area, the tool will propose the user to select different locations.*
- *Fluvial mode is limited to trips between Marseille-Fos/Valence/Lyon*
- *SSS mode is limited to services between ports of Barcelona/Marseille/Savona/Genova/Livorno and Civitavecchia. However, although all port pair combinations can be selected, those that result in using two consecutive services are not very feasible options.*



## Simulation model

### Emissions

The model used for calculating emissions for each mode of transport has been developed by the Port Authority of Barcelona based on existing models like EMEP/ CORINAIR from the European Environmental Agency, complemented with other sources. Length of trip for each mode is multiplied by unitary emission factors in order to obtain the overall emissions.

The emissions and pollutants considered are:

- $CO_2$ equivalent (includes the greenhouses gases $CO_2$,$N_2O$ and $CH_4$)
- NOx ($N_2O$ excluded)
- $PM_{2.5}$ (Particulate matter)
- CO
- NMVOC (non methane volatile organic compounds)
- $SO_x$ (sulphur from shipping modes)

### Externalities

Transport externalities are obtained using the average factors from the Handbook of external cost of transport issued by the European Commission in 2014, multiplied by the length of the trip in each mode. They include the following values

- Congestion
- Accidents
- Pollution
- Noise
- Climate Change
- Up-Downstream processes
- Infrastructures

### Certified methodology

The methodology has been reviewed and certified by **TÜV Rheinland** and reviewed and validated by the Institute for the Organisation and Control of Industrial Systems at the **Polytechnic University of Catalonia.** Review and validation conducted in 2011 and 2014.

**CLYMA** project consists of the implementation of the corridor approach to a section of the **Mediterranean corridor**, concretely to the Western part of the corridor and specifically to the Lyon-Madrid Axis.

The project comprises of studies and actions on the organization and optimal implementation of the **TEN-T network**, taking into account long term perspectives, environmental aspects and associated needs, as well as studies that promote environmental sustainability, resource efficiency and low-carbon transport within an integrated transport concept. This should stimulate the deployment of the **Green Corridor concept.** The project also intends to develop a **managerial structure** for the intermodal corridor.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