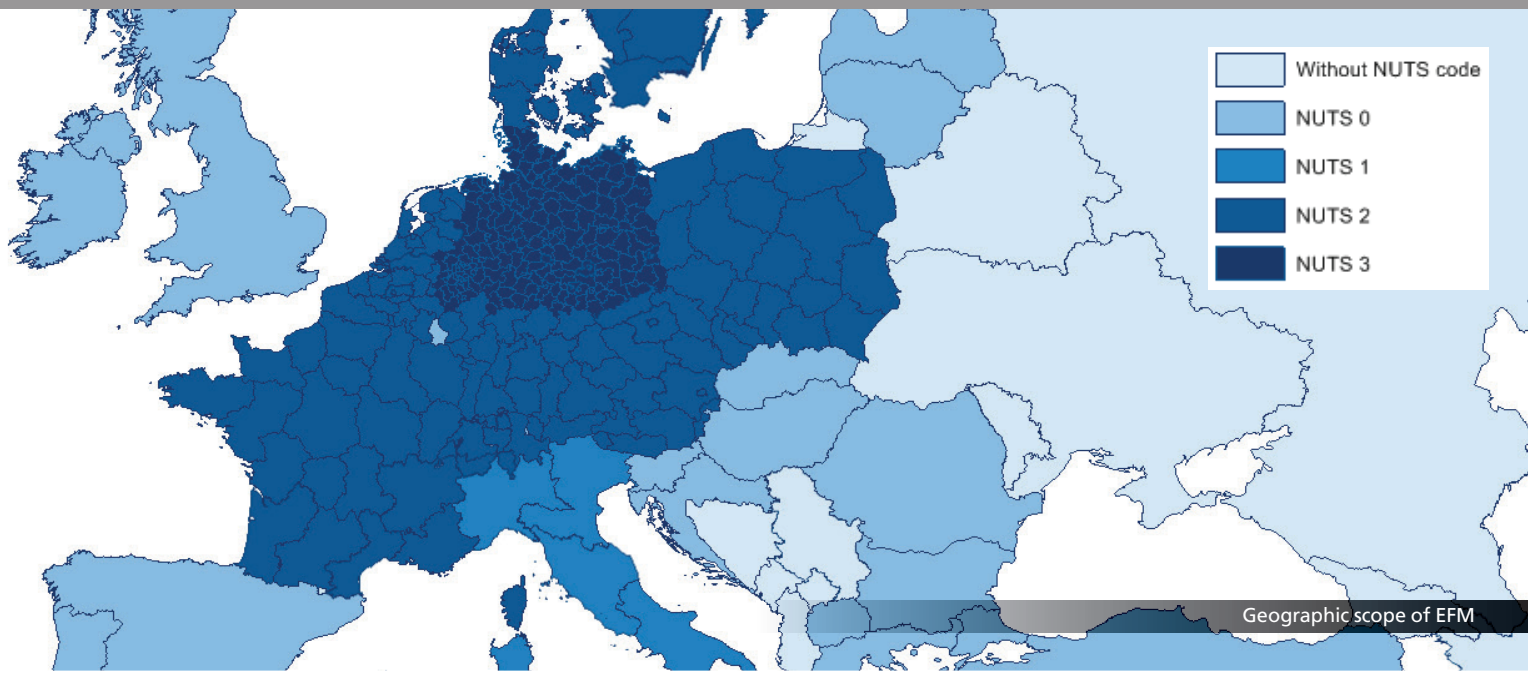
Fraunhofer CML

PRODUCTS

FRAUNHOFER CENTER FOR MARITIME LOGISTICS AND SERVICES CML



Geographic scope of EFM

EUROPEAN FREIGHT MODEL - EFM

European Freight Model

The European Freight Model (EFM) is a macroscopic freight transport model for seaport hinterland traffic. As a strategic tool, EFM supports decision-makers in reacting to challenges related to intermodal freight transportation.

The EFM network includes the European seaport and hinterland transport infrastructure. EFM is easily adaptable to various scenarios such as volume increases or infrastructure expansions.

Areas of application for EFM

EFM is a tool for efficient analysis of freight transportation. Areas of application include:

- Planning, assessment, and justification of infrastructure investments;
- Comparison of scenarios of future traffic developments and their impacts on transport modes and infrastructure;
- Comparison of locations regarding their hinterland accessibility.

Using EFM as a modeling tool improves process efficiency of intermodal transport chains and reduces investment risks. Due to its adaptive nature, EFM can easily be customized to the needs of various seaports.

The included scenario manager helps to analyze variations of potential developments. By using reference samples the results of different scenarios can be easily compared.

Target Group

Modeling tools are an important asset for organizations seeking to invest in infrastructure expansion projects. Modeling tools can be used to calculate different scenarios, helping to reduce investment risks. They support planning processes such as transport routing.

EFM supports all parties interested in analyzing aspects of freight transportation, such as infrastructure providers, transport companies, shipping companies, and public authorities.

Motivation for using EFM

Freight transportation to and from seaports accounts for a large part of traffic on railways, roads and inland

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IMPRESSUM

Cargo handling and hinterland connection

Hinterland transport modes road and rail

Your need for an impact assessment by means of freight transport modeling

Step 1: Situation and problem analysis

- Specification of your concern
- Analysis of the problem situation and the framework conditions
- Analysis of investigated system

Step 2: Adaptation and customization of EFM

- Implement new or change existing infrastructure network
- Change transport demand matrices
- Update data

Step 3: Simulation runs

- Simulation runs of the customized EFM
- Run scenarios according to customer requirements as required

Step 4: Simulation results

- Use reference samples to compare the results of the scenarios
- Documentation and interpretation of results

Recommendations for problem solution derived from EFM results

waterways. Increasing traffic volumes will result in an increased utilization, strain, and deterioration of the existing infrastructure.

Reliable forecasting of capacity utilization as well as future infrastructure needs is challenging. Transport models aim to enable such forecasts by analyzing different scenarios for traffic volume development.

Components of EFM

EFM is a tool to analyze freight transportation along intermodal transport chains, including the transport modes road, rail and inland waterway. EFM consists of three main components that allow the supply and the demand side of freight transportation to be interlinked.

These three components are the network model, the distribution model, and the traffic assignment model.

1. Network model

The network model represents the supply side of freight transportation. It includes infrastructure networks for road, rail and inland waterway transportation. The network model consists of terminals for the handling between the transport modes road, rail and inland waterway. Different types of terminals such as trimodal seaports or bimodal inland terminals are differentiated. The geographic focus of EFM is Europe.

2. Distribution model

The distribution model (also called demand model) includes the volumes in tonnes transported between origins and destinations. These volumes are imported into the EFM as origin-destination matrices per commodity type. Commodity types are differentiated by value and weight. The matrices comprise 237 terminals and 380 zones across Europe.

3. Traffic assignment model

The traffic assignment model consists of the mode and route choice. The transport demand is assigned to different means of transportation (modal split model), based on the criterion of cost minimization. The results of the modal split model are then assigned to the transport network. The route with the lowest resistance is selected.

The actual choice of a route is determined with the software PTV Visum.

When using EFM for individual customers, Fraunhofer CML enacts four steps. These steps are illustrated in the process chart pictured on the left hand side.

Fraunhofer CML`s expertise

Fraunhofer CML has comprehensive knowledge concerning the structural changes of the transport and logistics markets, especially regarding the composition of intermodal transport chains and the relevance of specific routes.

EFM has proven to be a useful tool that can be adapted to customer specific requirements in a quick and efficient way.

EFM qualifies Fraunhofer CML to run analyses for various stakeholders and scenarios as well as develop customer specific freight transport models if required.