Intermodal Terminal Eco-efficiency Calculator – ITEC
“CO2 Calculator for intermodal terminals”

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Main idea: Intermodal Terminal Eco-Efficiency Calculator (ITEC)

- To enable terminal operators to accurately calculate their current GHG emission performance;
- To identify where terminal “hot spots” are with regard to energy consumption and GHG emission;
- To determine what impacts different measures in the context of a terminal have, either in an ex ante (scenario) or ex post (monitoring) perspective.
Position within the intermodal transport chain

Intermodal Transport Chain

Shipper → Road → Rail → Road → Store

Intermodal Terminal

DIN EN 16258*

* Methodology for calculation and declaration of energy consumption and GHG emissions of transport services (freight and passengers), March 2013.

Warehouses & transhipment facilities not covered by the norm, yet.
Functional specification

• ITEC refers to the terminal as functional entity
  • considering all energy/GHG relevant processes and facilities,
  • regardless the recipients of the energy bills.
Methodical approach

1. Capture of actual terminal processes, as far as relevant for energy/GHG calculation
   - Considering interdependencies between infrastructure, operation and technique
   - Defining main parameters of energy consumption/GHG emission

2. “Translation” into model processes
   - Considering interdependencies between infrastructure, operation and technique
   - Defining main parameters of energy consumption/GHG emission

3. Transfer of model processes into a calculation tool
   - Basis: GaBi software of PE (adapting existing, proven software)
   - Including relevant standards, lifecycle approach, comparison of scenarios

Collection of data (specific energy consumption, terminal infrastructure, transhipment capacity, etc.)

Collection and inclusion of greening measures with respect to process parameters
ITEC – Captured processes

Rail

- Line locomotive
- Shunting locomotive
- Loaded wagons
- Empty wagons
- Cargo movements
- Truck
- Terminal transport vehicle

Terminal

- INTERMEDIATE PROCESSES
  e.g. Floating procedure, Damaged wagon exchange

- TRANSHIPMENT

- ADDITIONAL SERVICES
  - REEFER STORAGE
  - HAZARDOUS GOODS
  - EMPTY/LOADED CONTAINER DEPOT

- OFFICES

- TERMINAL SUPPLY & DISPOSAL

Road

- RAIL ARRIVAL / (DEPARTURE)

- ROAD (ARRIVAL) / DEPARTURE
Model implementation in GaBi

GaBi is the most widely used product sustainability solution on the planet

- Helps businesses achieve **optimal product sustainability performance**:
  - Environmental
  - Social
  - Economic

- GaBi is a modelling, reporting & diagnostic software tool that drives product sustainability performance during design, planning and production.

- Powerful LCA tools and databases for product and process sustainability
Vision: The Green Hub

Source: Demonstration Partner: Jernhusen
Use case: Stockholm

Source: Demonstration Partner: Jernhusen
Stockholm-Arsta: Opening 5/2014
Main advantages for users (1)

• Functional terminal approach closes the knowledge gap to line oriented CO₂ calculators and standards (e.g. CEN 16258);
• ITEC can be used ad hoc (no data interfaces needed, no requirements concerning dedicated IT terminal systems or data exchange formats);
• Very detailed capturing of all energy relevant processes possible (800 ITEC parameters might be modified on demand);
• In case of missing terminal specific parameters, experience figures and model calculations are available
  → Missing terminal specific data does not prevent ITEC applicability;
  → Quick, rough estimation with experience figures possible;
Main advantages for users (2)

• Single “greening” measures can be implemented (e.g. replacement of transhipment facilities, modified rail/road infrastructure, new road check-in or wagon repair procedure);

• Not only total carbon footprint/”greening” effect, but detailed results:
  → Identification of “hot spots” (e.g. by processes or mode);
  → Explanation of different specific energy consumptions of terminals;
  → Evaluation of greening impact of (single) measures or measure bundles;

• Use of proven GaBi software in line with standards (e.g. CEN 16258) and respective methodical basics
  • 1st priority: use of exact, measured data,
  • next priorities: use of average data or analogy methods
Main advantages for users (3)

- Result documentation (Word/PDF) automatically generated;
- Visualisation of parameter modifications (scenarios) on the spot;
- Consideration of (country/terminal) specific energy mix;
- Desktop and web application available;
- Standardised template for data gathering (energy consumers and their specific consumption);
- Operational procedures can be clarified with terminal operator via video/telephone conference, using standardised check-list (ca. 2 h);
ITEC Development Partners

Planning Intermodal Terminals
Train Monitoring Tools
Software Development

„Sustainability“ Experts
Energy Process Analysis
Software Development

Intermodal Terminals Processes
User Requirements from AGORA
Software Testing
ITEC Use Cases

Neuss Trimodal

KombiConsult

Jernhusen

IFB

combinant

ADRIA

KOMBI

INTERPORTO Bologna
Strategic location of AGORA terminals and nodes of European corridors
KombiConsult Profile

POLICY ADVICE
Advice of transport administrations and international organizations on strategic and transport policy issues.

INTERMODAL LOGISTICS
Development of port-related, intermodal services for trans-European ports and groupage shipments.

TERMINAL MANAGEMENT
Advice for terminal development and terminal operation.

MARKET INTELLIGENCE
European intermodal transport volume (in million tons).

ADVISORS TO THE INTERMODAL WORLD
Thank you for your attention

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