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on Transport, Trade Logistics and Trade Facilitation:

Transport and logistics innovation
towards the review of the Almaty
Programme of Action in 2014

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USING A STRATEGIC DECISION MAKING TOOL TO
DESIGN AND OPTIMIZE SUPPLY CHAIN NETWORKS
(A BEST PRACTICE IN GLASS RECYCLING)

by

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CNUCED Presentation
-
October, 23rd 2013

ISEL, a school unique in France

✓ ISEL, school of logistics is the only public engineering institute in France in the field of logistics

✓ Some figures:
   – School founded in 1994
   – 465 graduated engineers
   – 212 students (2013/2014)
   – 40% women
   – Around 50 new graduates each year
   – 95% graduates under contract in less than 6 months
   – ISEL 800 program: double the number of students by the coming years
ISEL, a school unique in France

- ISEL has numerous foreign partner institutions, both European (Socrates/Erasmus programme) and worldwide

- ISEL has also 2 main partnership agreements with the universities of Hull (UK) and Magdeburg (Ger)

- A specific entity, Comptoir of Logistics (value-creation entity)

Comptoir of logistics

- Comptoir of Logistics:
  - Project engineering
  - 14 colleagues
  - 3 main competences:
    • Modeling/simulation
    • Supply Chain trade skills diagnosis (Audit)
    • Major projects and cooperation

- Construction of decision making tools

- We design both strategic (network optimization) and operational (process/flow optimization) models
Modeling and simulation

✓ Modeling is a symbolic representation of some aspects of an object or a real phenomenon

✓ Simulation enables to develop a model and to test different configurations (time, spatial configuration, ...) under different constraints
CAST Aurora: a strategic support tool for Supply Chain planning

✓ Interests:
  - To gain insight
  - To quantify relationships
  - To optimize
  - To generate and evaluate options
  - To test sensitivities
  - To remove emotion and politics
  - To adopt a rigorous process
  - To provide a point of expertise...

✓ Results:
  - Network Optimization
  - Warehouse positioning
  - Transport Mode selection
  - Supply & Demand allocation
  - Carbon optimization

✓ Consider all elements of the Supply Chain in a single, integrated model

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Modeling and simulation – Methodology

1: Project definition, objectives
2: Flow diagrams, mappings...
3: Technical data, key variables, constraints
4: Perimeter, functionalities, elements...
5: Data analysis (folding, deleting, combining...)
6: Study period, units, rules and constraints
7: Model design
8: Model implementation → Simulation run
9: Assumption tests (analysis and recommendations)
Partners

AUTOMOTIVE GLASS RECYCLING
Context and objective

Context

European regulation: from 2015, 95% of the total weight of an End of Live Vehicles (ELV) should be re-used / recycled.

Concerning this issue, France is not a model in Europe: only 81% of an ELV is be re-used / recycled.

Automotive glass is not recycled and is representing 3-4% of the total weight...

Objective

Establish a profitable network for glass collecting and recycling of the French manufacturer Renault

Partners

Industrials

Engineering schools

Association

Public partners
ISEL objective

Create a decision making tool to size and define the cost of the collecting, storage and distribution network of reusable glass in France (including carbon footprint)

Actors of the supply chain

- Glass deposits
  - Car crushers
  - Car dealership
  - Windscreen repairer (Carglass, France Pare brise...)

- Collection platforms
  - Sita platforms
  - Renault platforms...

- Glass reprocessing sites

- Transportation companies
Model presentation – Main figures

- 3,615 collection points → 2,172 locations
- 52,571 tons of glass (24 kg/VHU)
- 142 collection platforms
- “6 customers” (glass demand)
- 4 different transportation vehicles

Résults

Base case

<table>
<thead>
<tr>
<th>Scénario</th>
<th>Number of tons</th>
<th>Collection</th>
<th>Platforms</th>
<th>Transfer</th>
<th>Total</th>
<th>CO2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Case</td>
<td>51,769 t</td>
<td>98 %</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Confidential data
Examples of scenarios

✓ Increase of the number of platforms

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Number of tons</th>
<th>Collection</th>
<th>Platforms</th>
<th>Transfer</th>
<th>Total</th>
<th>CO2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Augmentation du nombre de plateformes</td>
<td>51 797 t</td>
<td>98,5 %</td>
<td>Confidential data</td>
<td>-11%</td>
<td>-10%</td>
<td></td>
</tr>
</tbody>
</table>

✓ Existing platforms relocation

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Number of tons</th>
<th>Collection</th>
<th>Platforms</th>
<th>Transfer</th>
<th>Total</th>
<th>CO2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relocalisation des plateformes</td>
<td>51 797 t</td>
<td>98 %</td>
<td>Confidential data</td>
<td>-15%</td>
<td>-47%</td>
<td></td>
</tr>
</tbody>
</table>

✓ Use of new transportation companies (higher capacity vehicles)

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Number of tons</th>
<th>Collection</th>
<th>Platforms</th>
<th>Transfer</th>
<th>Total</th>
<th>CO2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nouveaux transporteurs pour le transfert (25 à 27 tonnes)</td>
<td>51 769 t</td>
<td>98 %</td>
<td>Confidential data</td>
<td>-14%</td>
<td>-19%</td>
<td></td>
</tr>
</tbody>
</table>

Average cost VS. % of collection

![Graph showing average cost versus % of collection for existing and relocated platforms](image)
Conclusions of the study

✓ Conclusions
  • The number and the location of each actor of the supply chain have a strong impact on the total cost
  • It is necessary to consider several key variables to reach the objectives of the project
  • It is important to gather products (minimize number of platforms) to decrease significantly logistics costs

✓ The use of CAST can be adjustable depending on your needs

✓ Importance of the size of the network and the granularity of the model

Thank you for your attention

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