Multi-year Expert Meeting
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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# USING A STRATEGIC DECISION MAKING TOOL TO DESIGN AND OPTIMIZE SUPPLY CHAIN NETWORKS (A BEST PRACTICE IN GLASS RECYCLING)

## CNUCED Presentation

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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

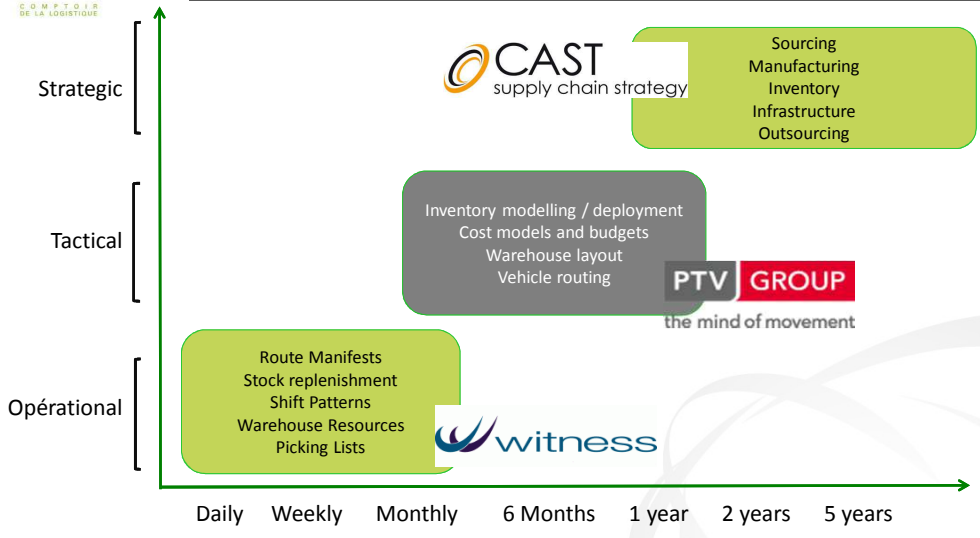
- ✓ Comptoir of Logistics:
  - Project engineering
  - 14 colleagues
  - 3 main competences:
    - Modeling/simulation
    - Supply Chain trade skills diagnosis (Audit)
    - Major projects and cooperation
- ✓ Construction of decision making tools
- ✓ We design both strategic (network optimization) and 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



## Modeling and simulation – Logistics issues



## Modeling and simulation – CAST Aurora

**CAST Aurora:** a strategic support tool for Supply Chain planning

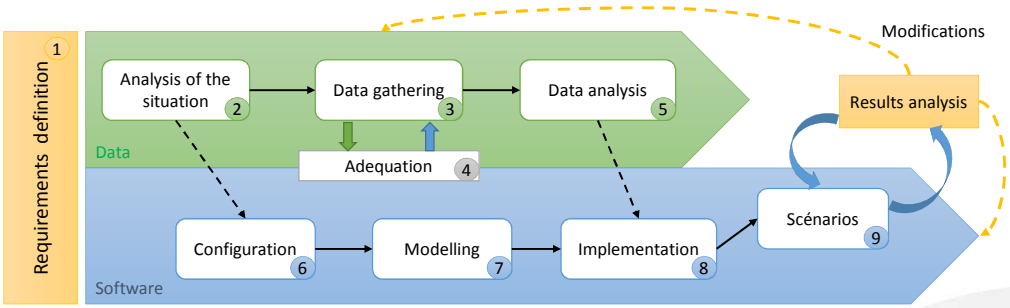
✓ Interests:
- To gain insight
- To quantify relationships
- To optimize
- To generate and evaluate options
- To test sensitivities
- To remove emotion and politics
- To adopt a rigorous process
- To provide a point of expertise...

✓ 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



## 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




# VALVER

FILIERE DE VALORISATION

## 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

SAINT-GOBAIN RECHERCHE, SVGZ SITA, RENAULT, Re-source, IPAQ

### Engineering schools

isel, CENTRALE PARIS

### Association

PRORECYCLAGE

### Public partners

ADEME, Yvelines Conseil général, Région Haute Normandie, îledeFrance, L'Europe s'engage en Haute-Normandie

## 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

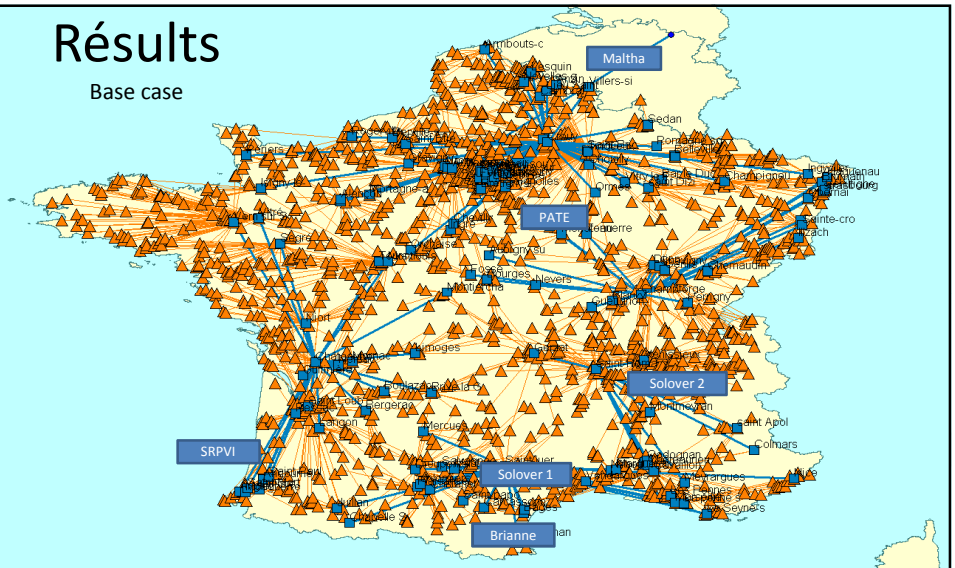
## Model presentation – Main figures

- ✓ 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



## Résultats

Base case




| Scénario | Number of tons | Collection | Platforms | Transfer | Total | CO2 |
|---|---|---|---|---|---|---|
| Base Case | 51 769 t<br>98 % | Confidential data | | | | |

## Examples of scenarios

✓ Increase of the number of platforms

| Scenario | Number of tons | Collection | Platforms | Transfer | Total | CO2 |
|---|---|---|---|---|---|---|
| Augmentation du nombre de plateformes | 51 797 t<br>98,5 % | Confidential data | | | -11% | -10% |

✓ Existing platforms relocation

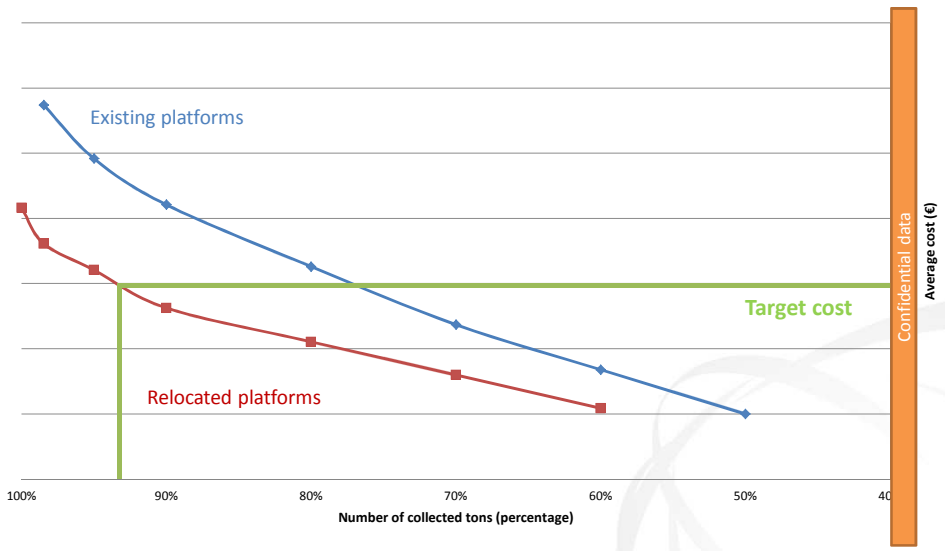
| Scenario | Number of tons | Collection | Platforms | Transfer | Total | CO2 |
|---|---|---|---|---|---|---|
| Relocalisation des plateformes | 51 797 t<br>98 % | Confidential data | | | -15% | -47% |

✓ Use of new transportation companies (higher capacity vehicles)

| Scenario | Number of tons | Collection | Platforms | Transfer | Total | CO2 |
|---|---|---|---|---|---|---|
| Nouveaux transporteurs pour le transfert (25 à 27 tonnes) | 51 769 t<br>98 % | Confidential data | | | -14% | -19% |



## Average cost VS. % of collection



## 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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