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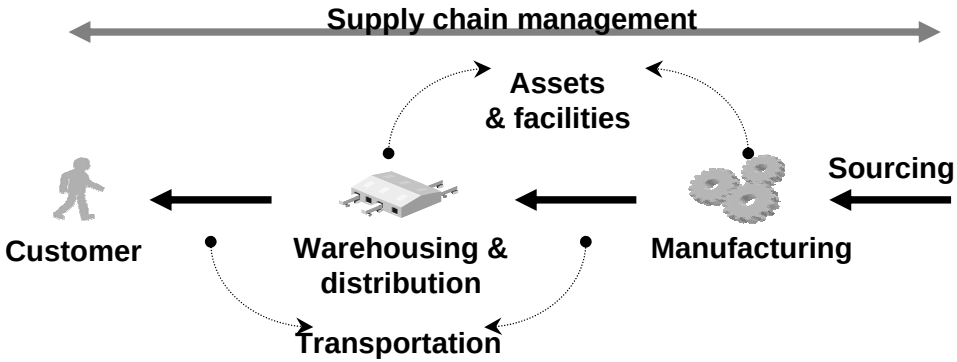
How to optimize Supply Chain footprints:

CAST Supply Chain Simulation Tool



GW ref. 9026X035 - Version 1.0

Supply Chain Footprint optimization

Objective

TO DETERMINE THE MOST OPTIMAL DISTRIBUTION NETWORK:

MEETING CUSTOMER SERVICE REQUIREMENTS

THE MOST COSTS EFFECTIVE SOLUTION

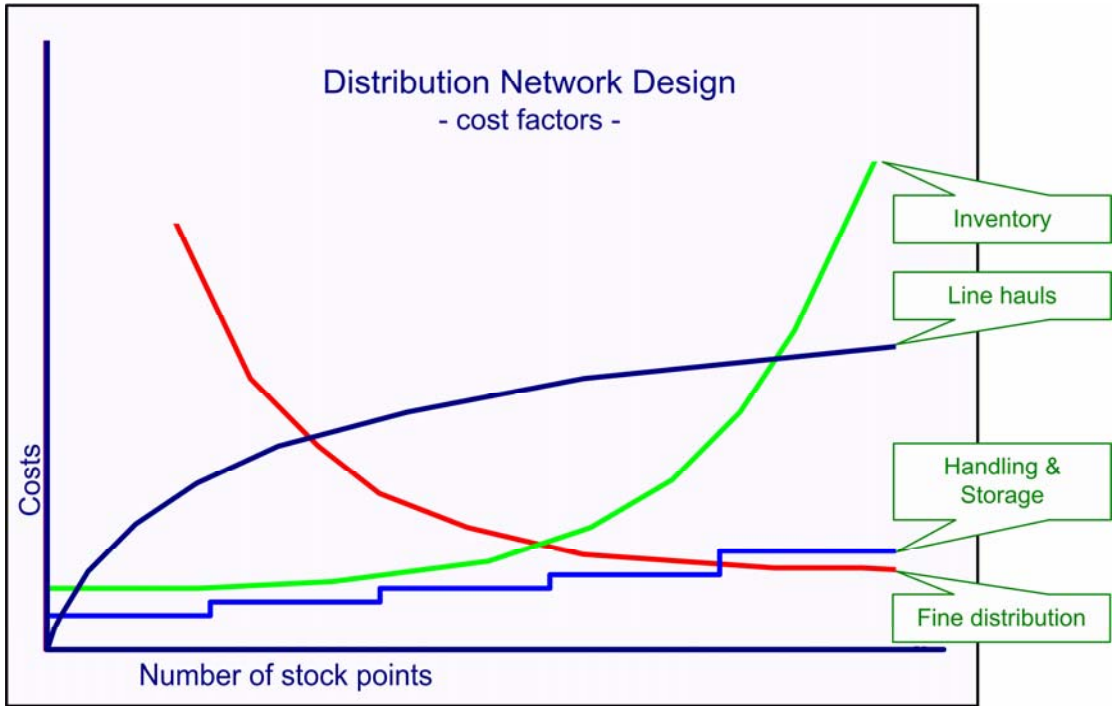
FACILITATES THE FUTURE STRATEGY

Supply Chain Footprint optimization

Cost trade-off

Optimized supply chain footprint design

- *Supporting customer service requirements*
- *Cost efficiency*
- *European supply chain transparency*
- *Business continuity*



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Supply Chain Footprint optimization

Approach

Analysis Distribution Network

- Requirement analysis
- Volume & costs data
- Assumptions & definitions

Set-up & verification of distribution network model

Distribution concepts analysis & simulation

Sensitivity analysis - sanity check

Distribution concepts evaluation

Implementation & transition plan

Supply Chain Footprint optimization

Deliverables – Distribution Network Optimization

Deliverables

- Data verification and presentation of results: Basic Design Document
- A distribution network model which will be used for further analysis of the different distribution network concepts
- Presentation of the various distribution network concepts: associated operational costs and customer service impact
- Validation of the robustness of the preferred distribution network & insight in the business parameters directly affecting the selection of a preferred distribution network concept
- Determine the preferred applicable distribution network concept
- Plan of approach and quantification of financial implications of implementation and transition of the new distribution network

Simulation tools

Options

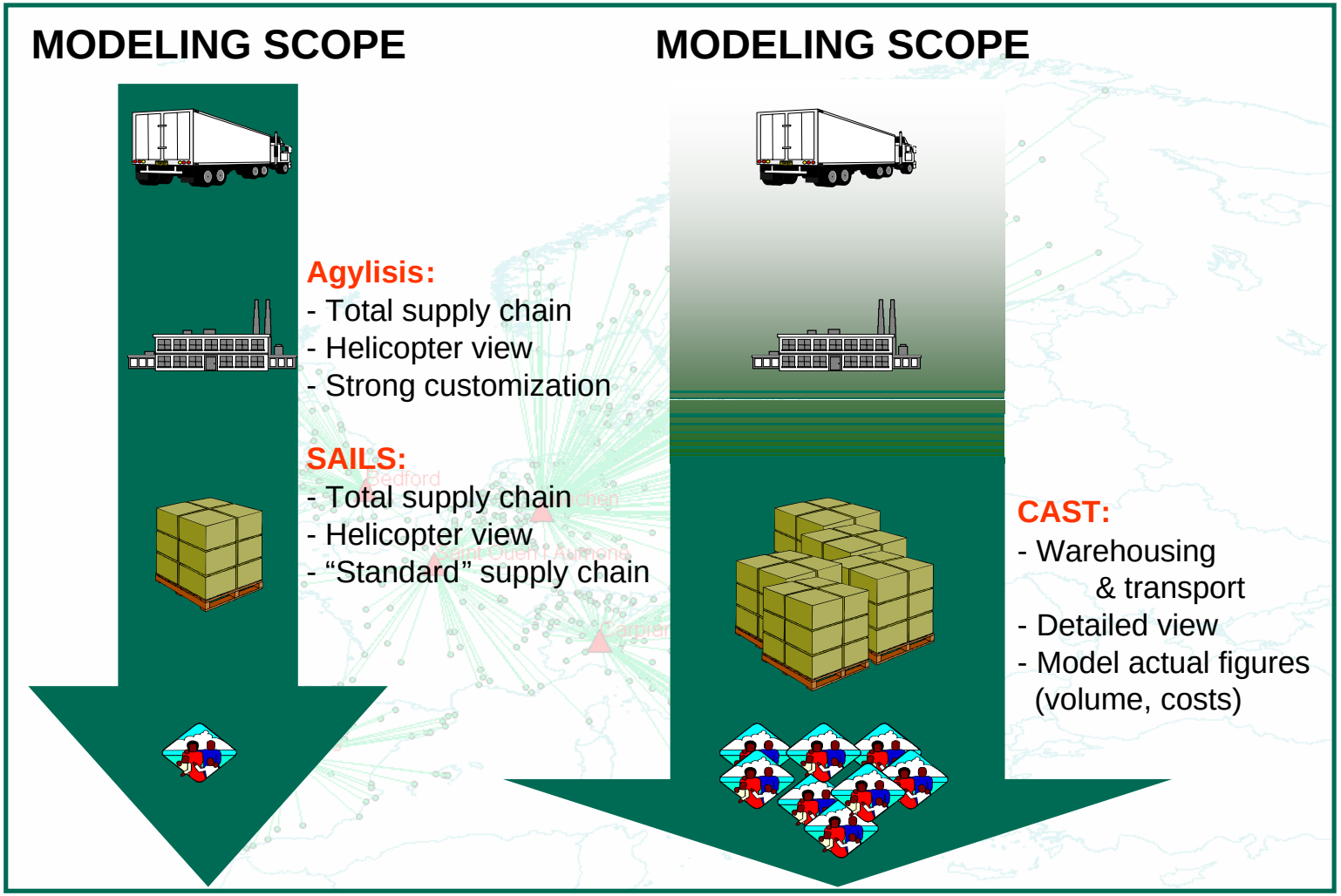
- Groenewout has Supply Chain Simulation experience with SAILS, Agylisis and CAST

- Groenewout has specialized warehouse & inventory optimization software available
  - *Ware-2-Store®:*
    to conduct a quick-scan on the operational design and costs of warehouse concepts during the Supply Chain Optimization
  - *What-2-Store®:*
    to determine an optimal balance between service levels versus stock levels in your warehouses

- Depending on the project objective and project scope Groenewout decides per individual project what Supply Chain Simulation software provides the best fit

Simulation tools

Considerations – best fit for project scope



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CAST

A sophisticated tool to simulate distribution networks

- Geographical modeling, taking into account actual distances via the road network
- Optimizing allocation of customers to depots, based on time constraints and handling- and transport costs
- Optimizing ways of transport
- Multi-depot center of gravity analysis

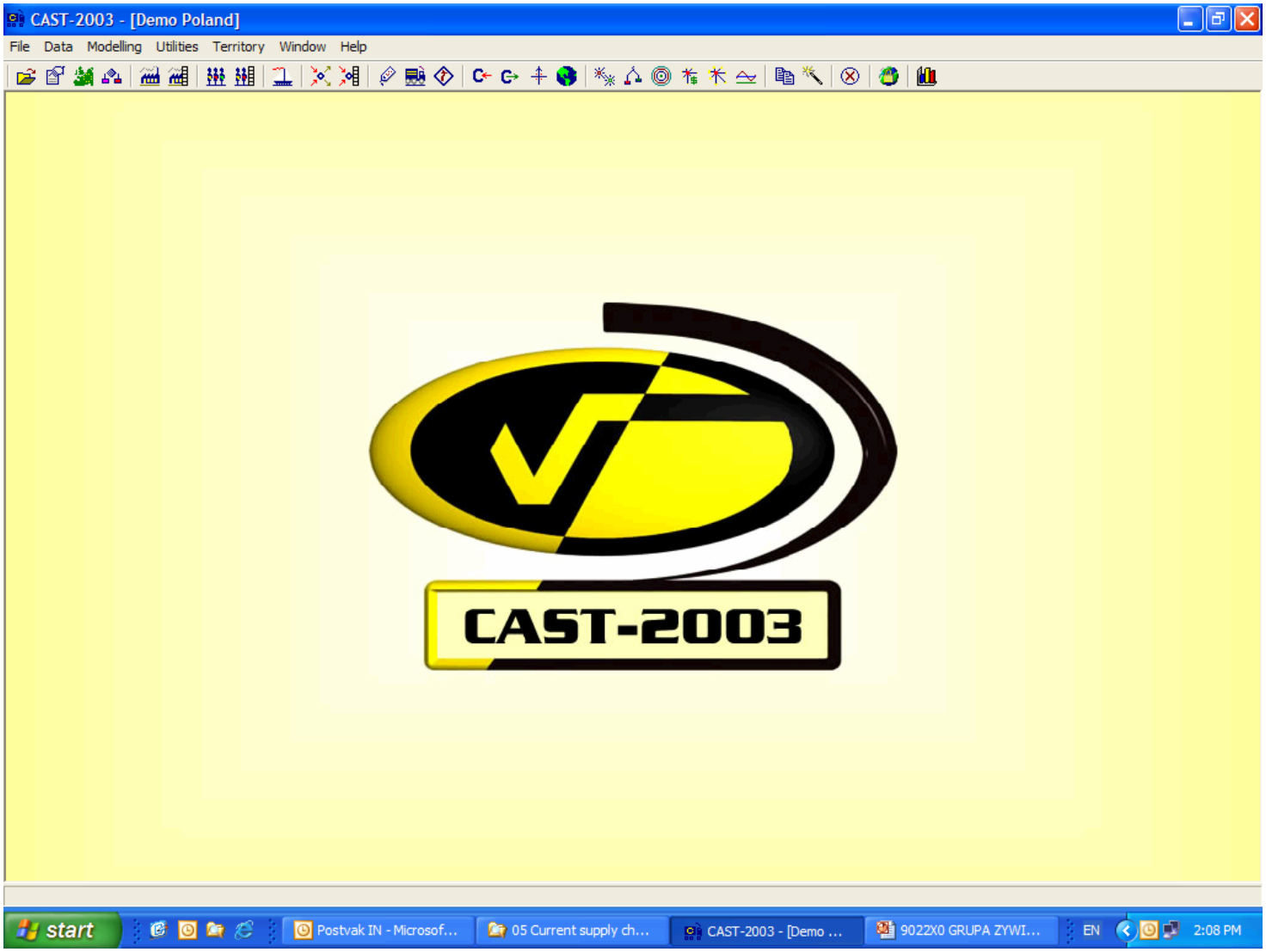
CAST

The modeling of the distribution network is accurate and detailed

- Up to 99 different distribution channels possible
- For supplier, manufacturing & warehouse locations, fixed and variable cost elements can be assigned
- Time and distance constraints are taken into account
- For modeling purposes, customers are aggregated based on the first two digits of the postal code

CAST

Screen shots



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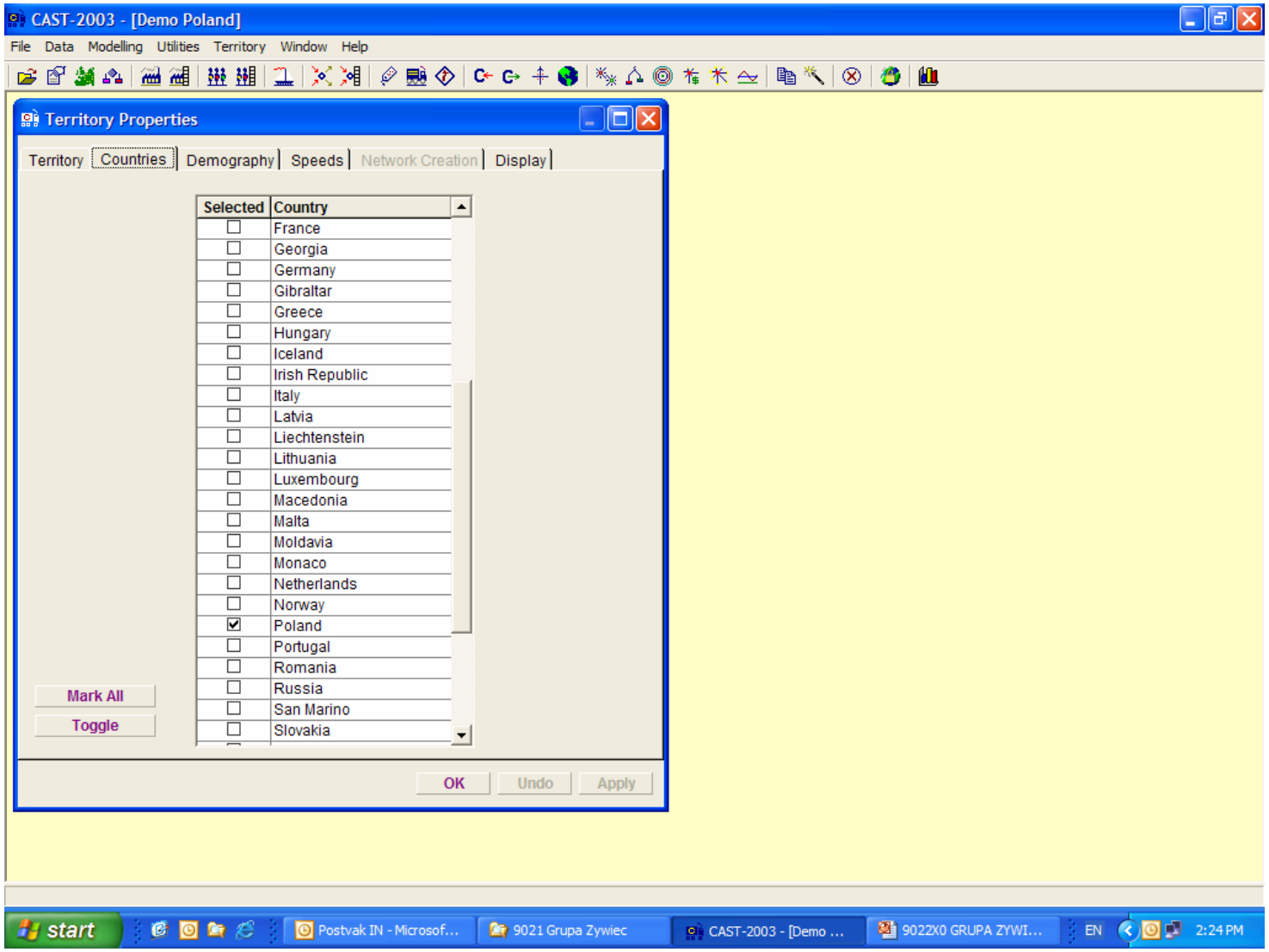
Input file

Territory properties



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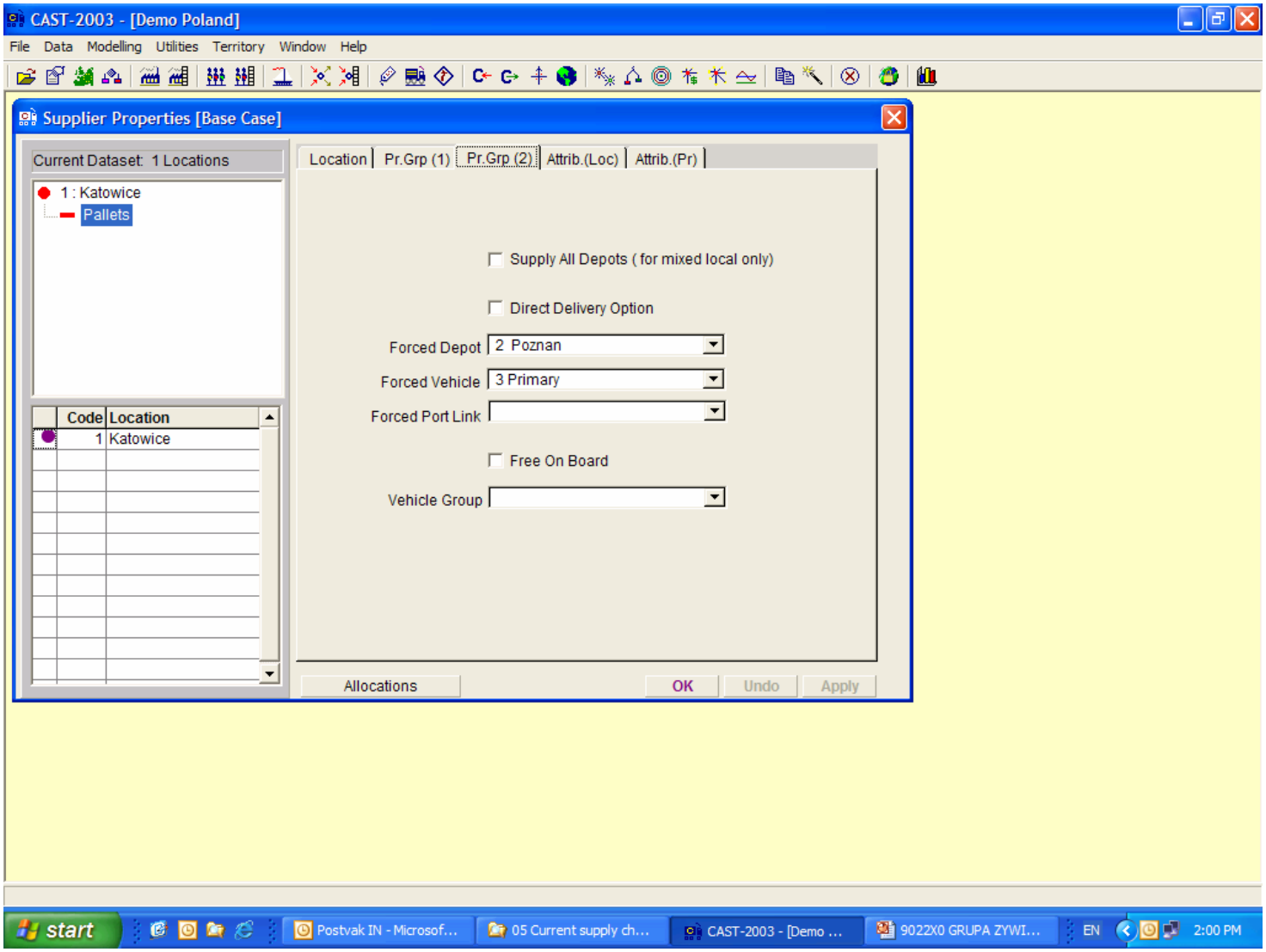
Input file
Supplier



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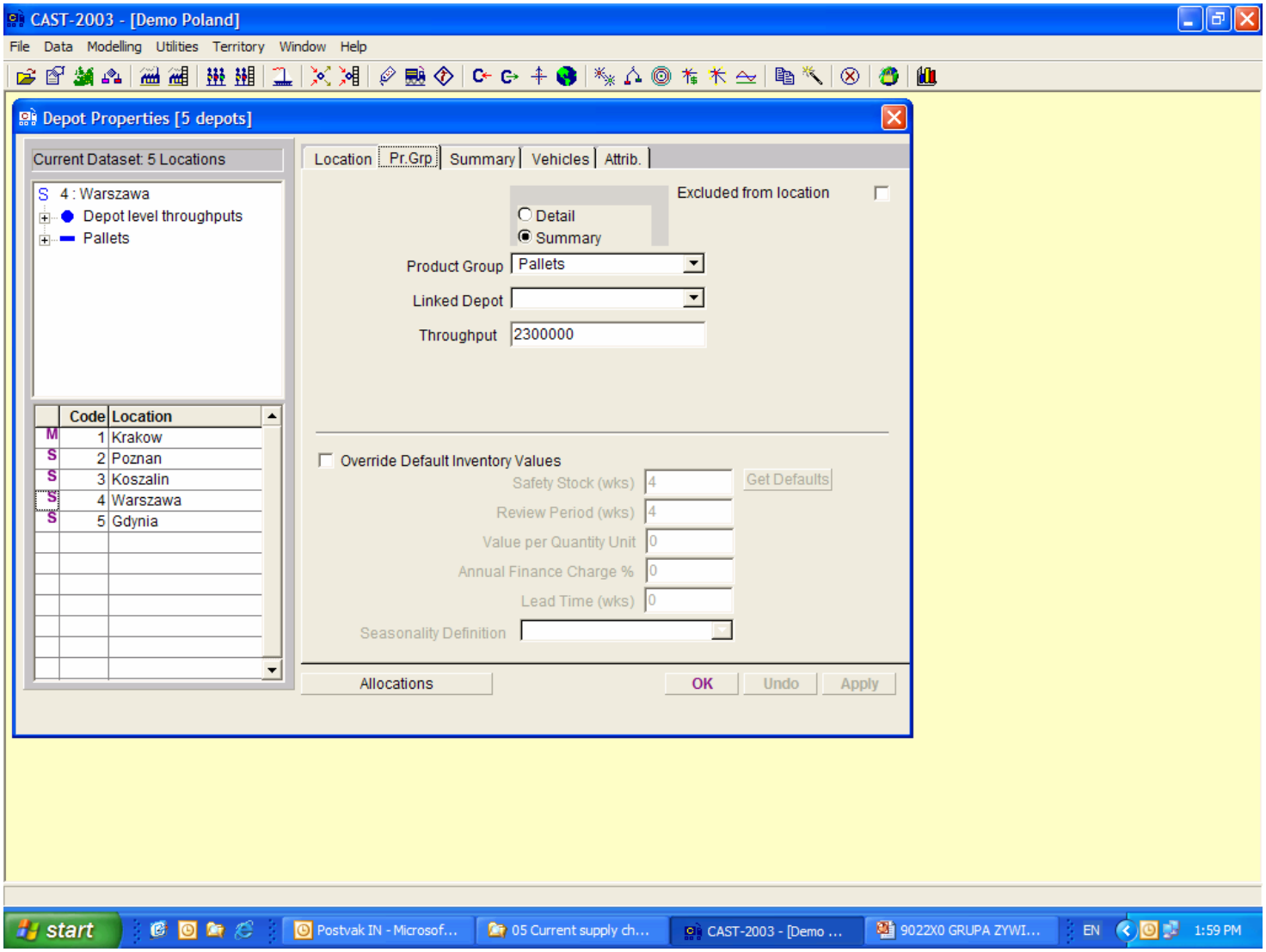
Input file
Warehouses



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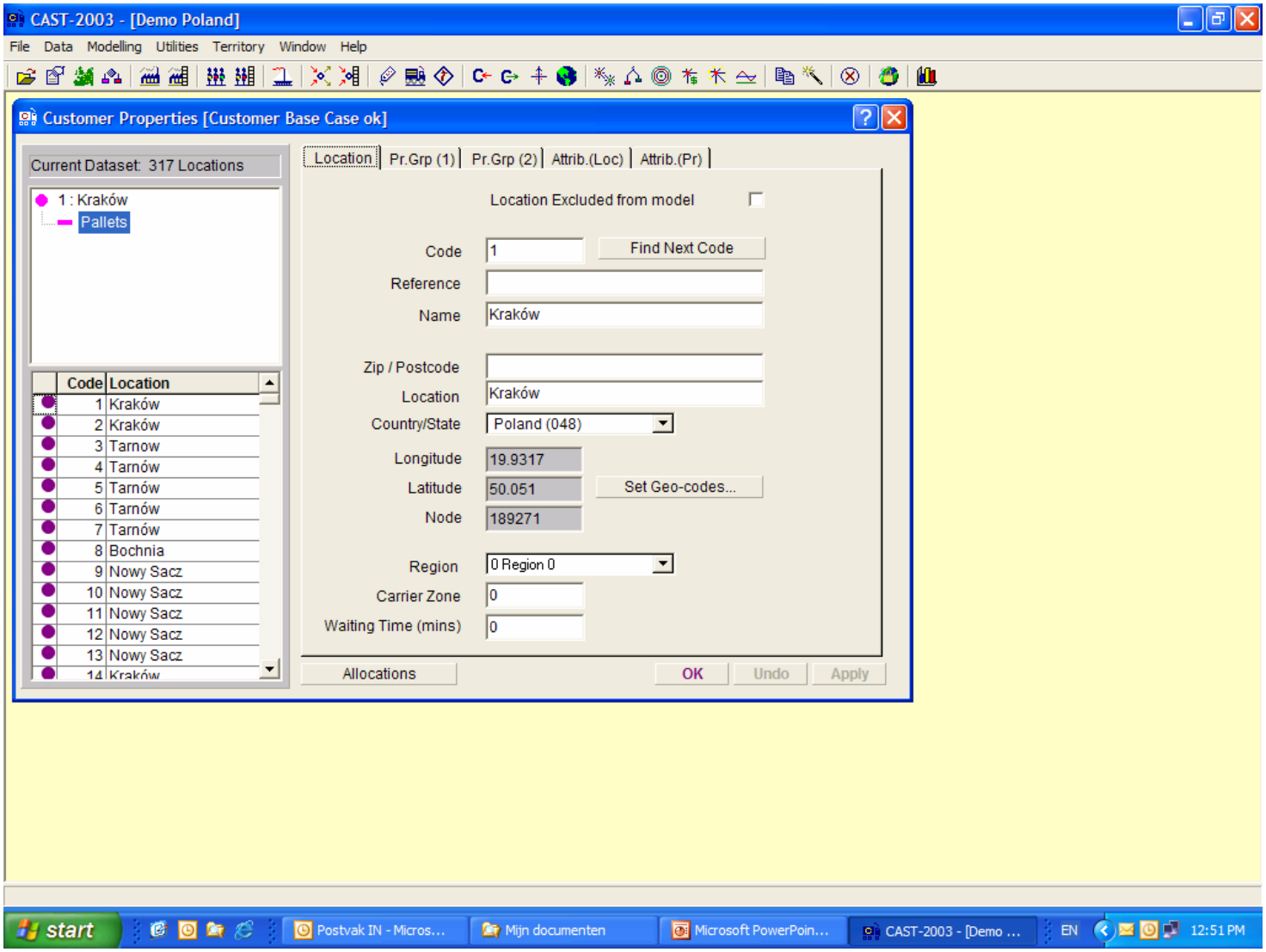
Input file
Customers



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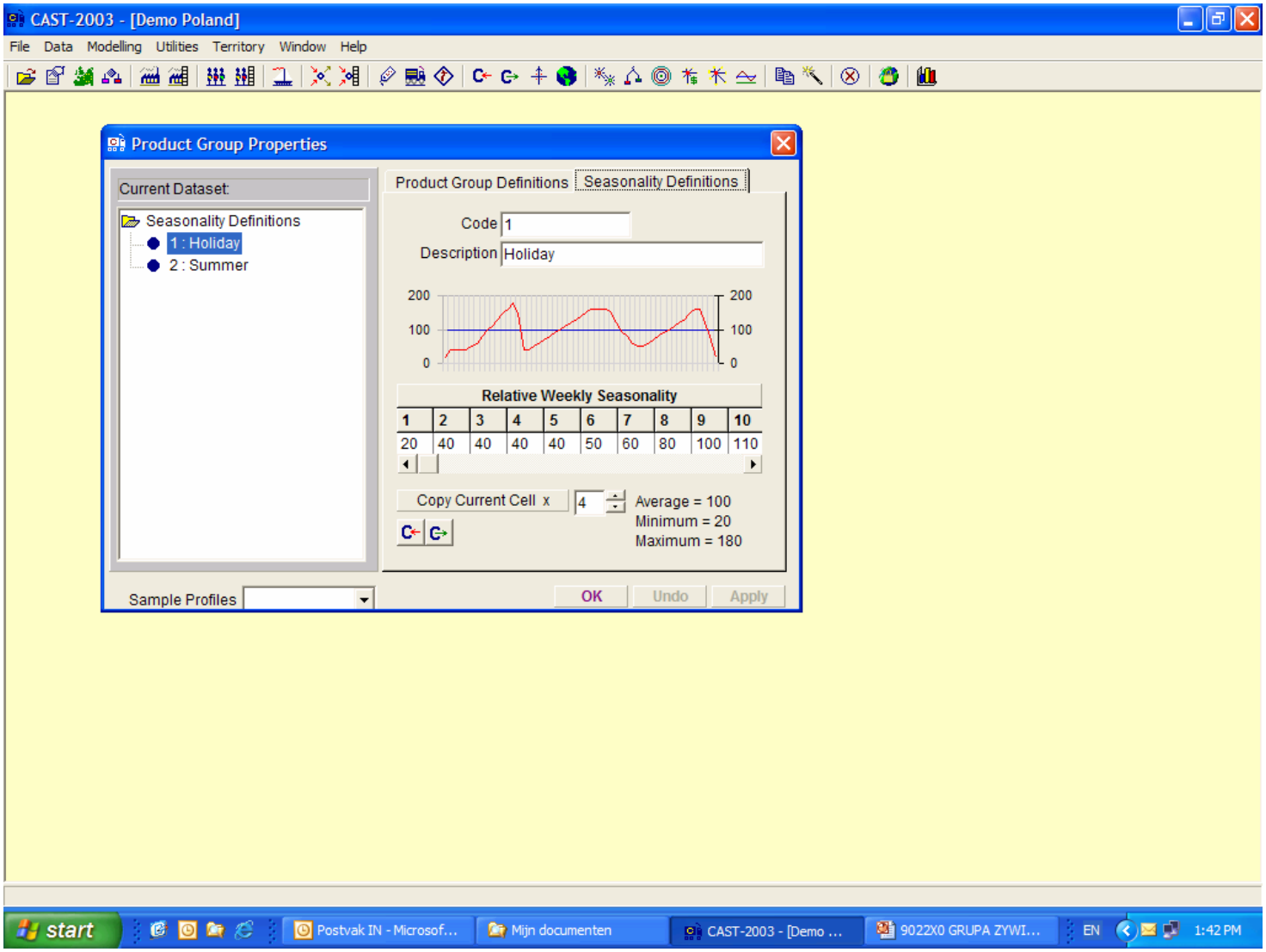
Input file

Inventory seasonality per product group



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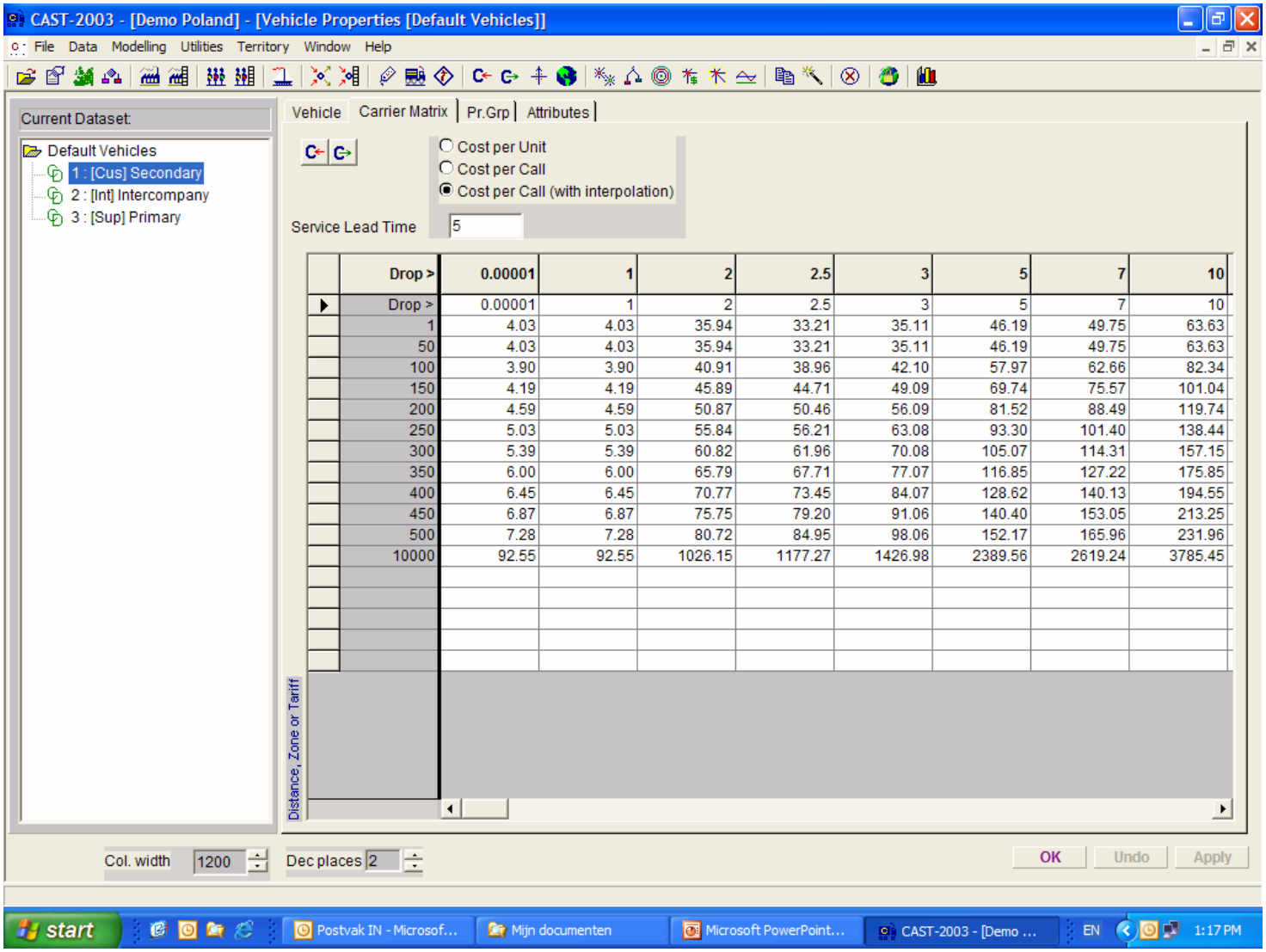
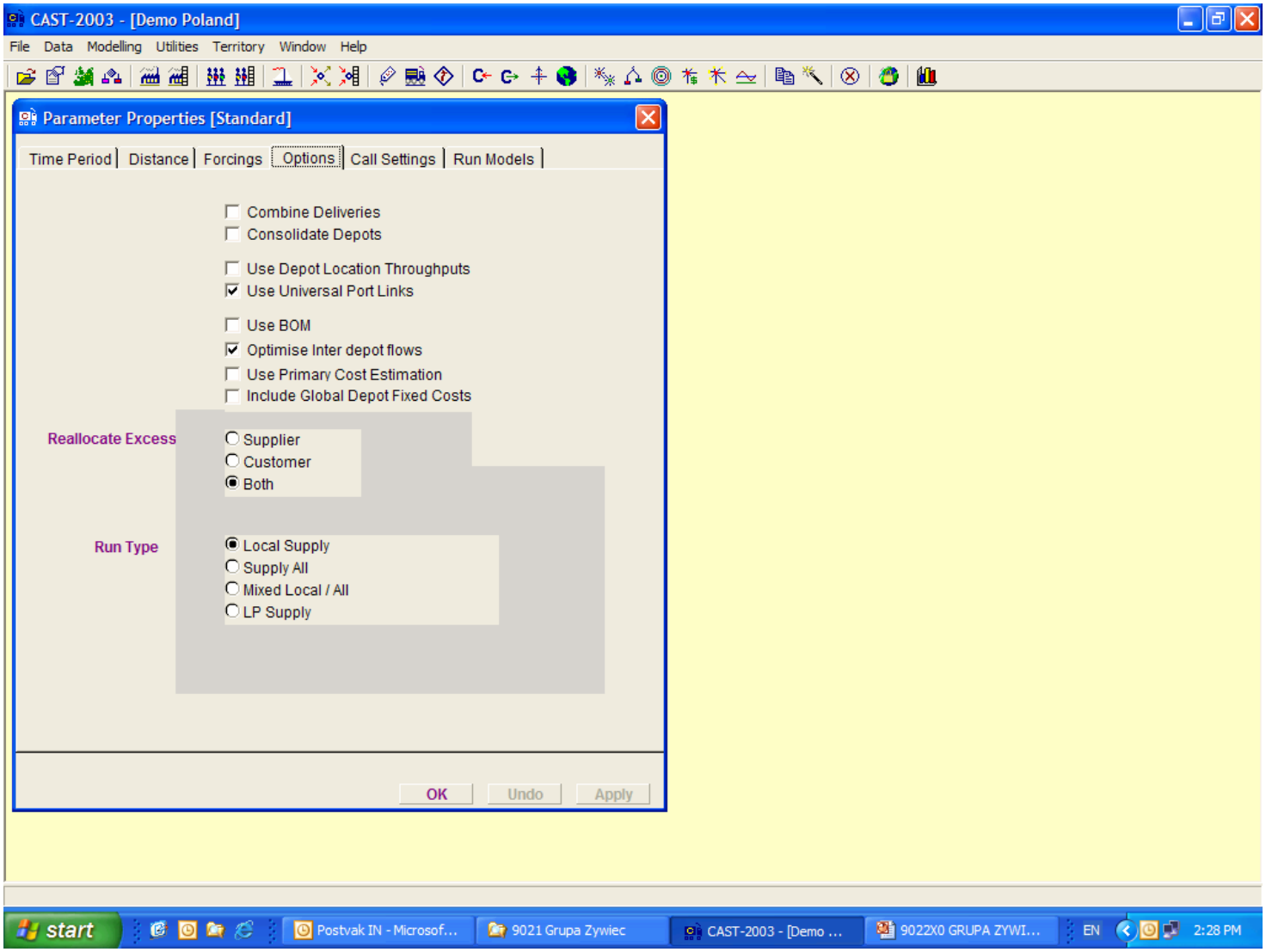
Input file
Vehicle rates



Drop >	0.00001	1	2	2.5	3	5	7	10
Drop >	0.00001	1	2	2.5	3	5	7	10
1	4.03	4.03	35.94	33.21	35.11	46.19	49.75	63.63
50	4.03	4.03	35.94	33.21	35.11	46.19	49.75	63.63
100	3.90	3.90	40.91	38.96	42.10	57.97	62.66	82.34
150	4.19	4.19	45.89	44.71	49.09	69.74	75.57	101.04
200	4.59	4.59	50.87	50.46	56.09	81.52	88.49	119.74
250	5.03	5.03	55.84	56.21	63.08	93.30	101.40	138.44
300	5.39	5.39	60.82	61.96	70.08	105.07	114.31	157.15
350	6.00	6.00	65.79	67.71	77.07	116.85	127.22	175.85
400	6.45	6.45	70.77	73.45	84.07	128.62	140.13	194.55
450	6.87	6.87	75.75	79.20	91.06	140.40	153.05	213.25
500	7.28	7.28	80.72	84.95	98.06	152.17	165.96	231.96
10000	92.55	92.55	1026.15	1177.27	1426.98	2389.56	2619.24	3785.45

Input file

Parameters settings



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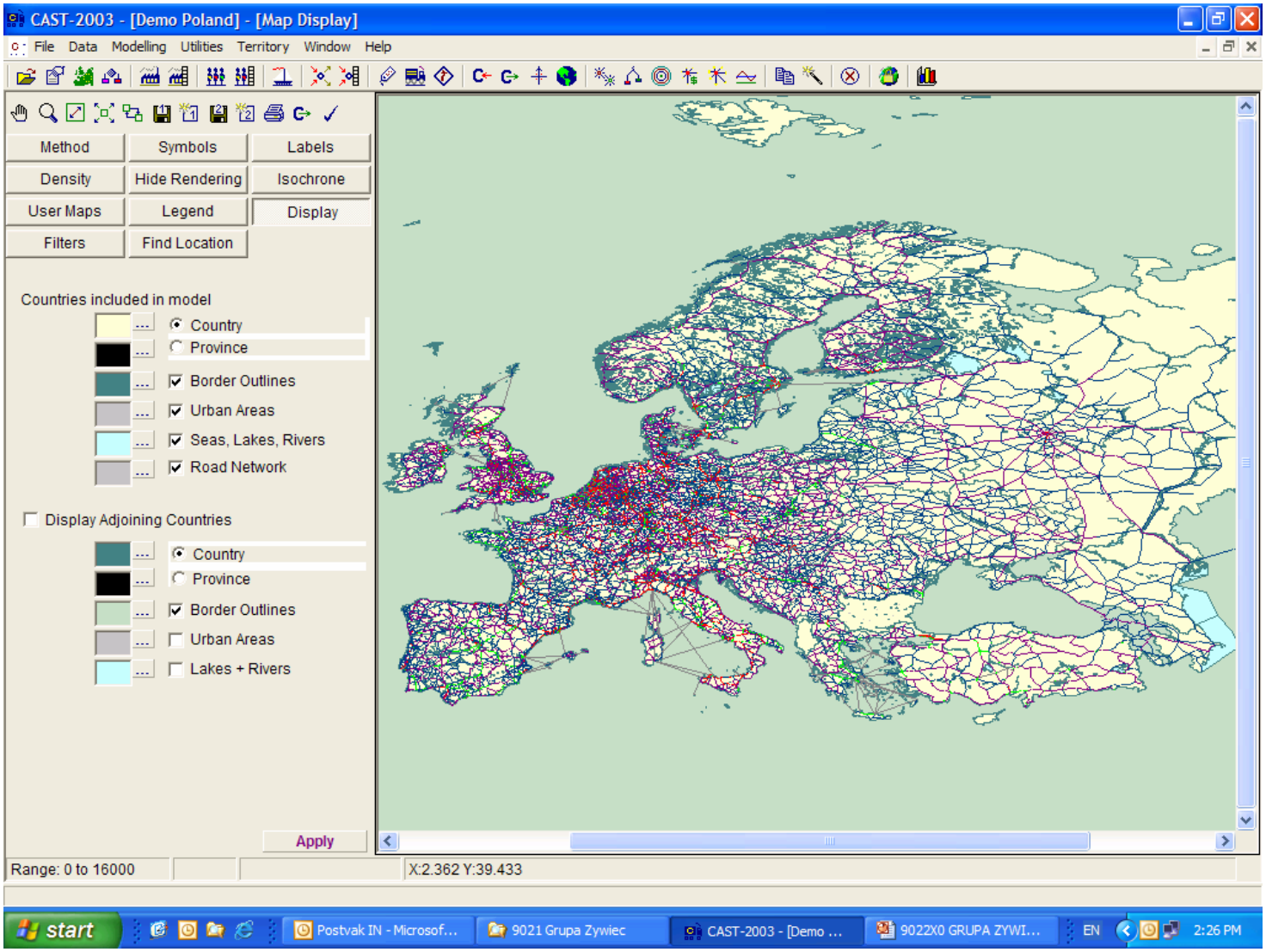
Calculations and results

Transport calculation based on real road network



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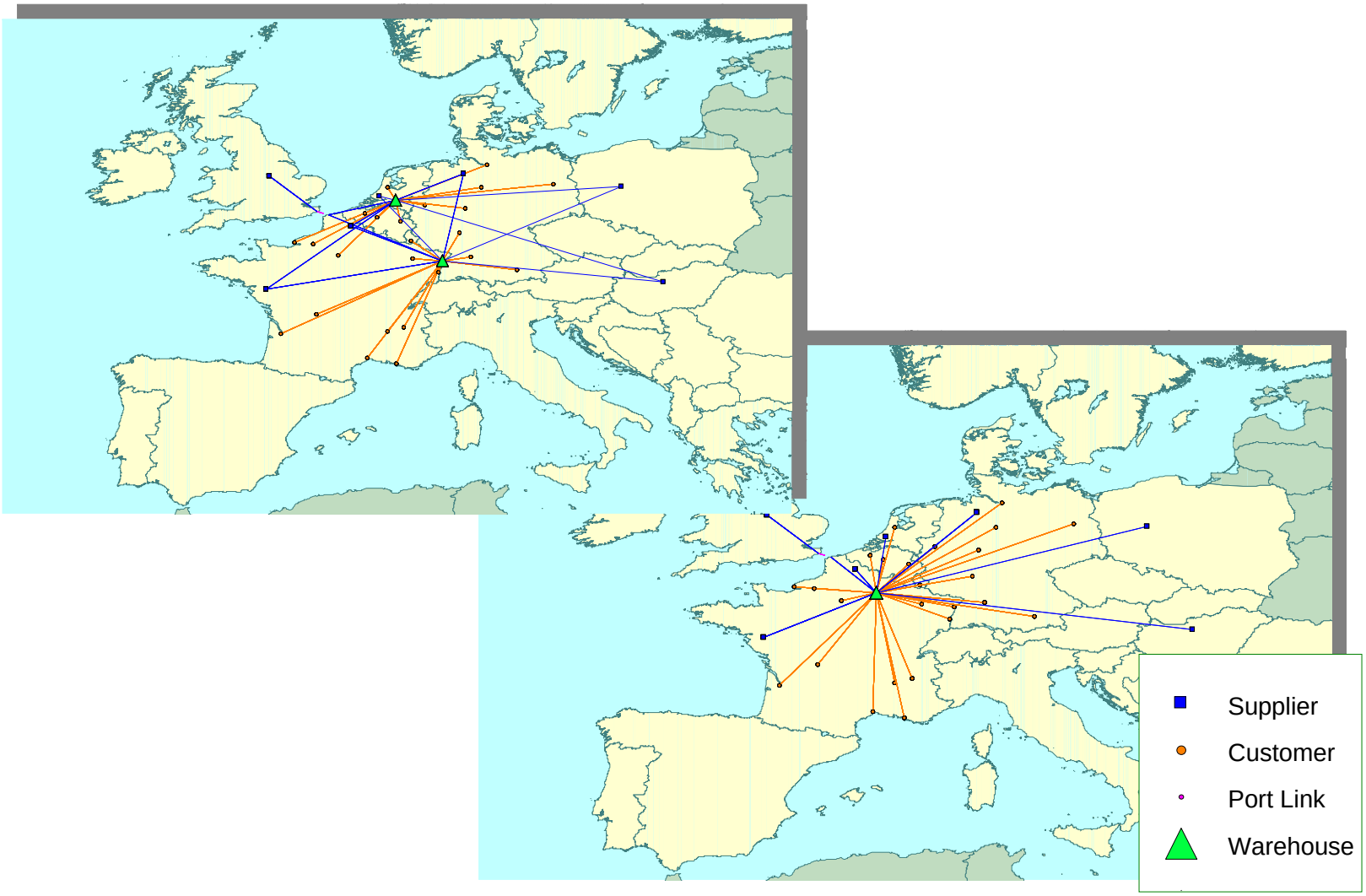
Calculations and results

Scenario comparison



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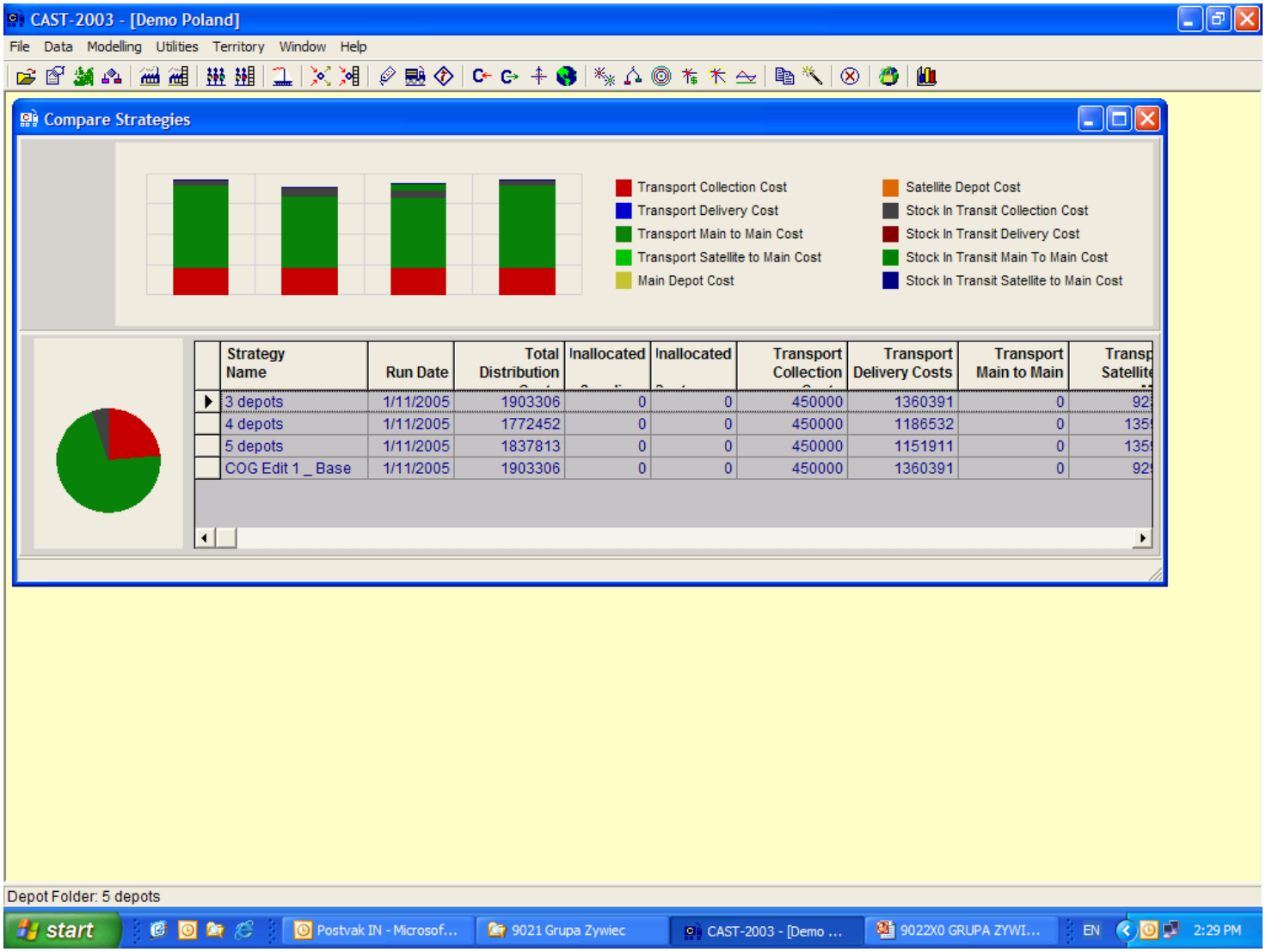
Calculations and results

Comparing strategies



Strategy Name	Run Date	Total Distribution	Inallocated	Inallocated	Transport Collection	Transport Delivery Costs	Transport Main to Main	Transp Satellit
3 depots	1/11/2005	1903306	0	0	450000	1360391	0	92
4 depots	1/11/2005	1772452	0	0	450000	1186532	0	135
5 depots	1/11/2005	1837813	0	0	450000	1151911	0	135
COG Edit 1 _ Base	1/11/2005	1903306	0	0	450000	1360391	0	92

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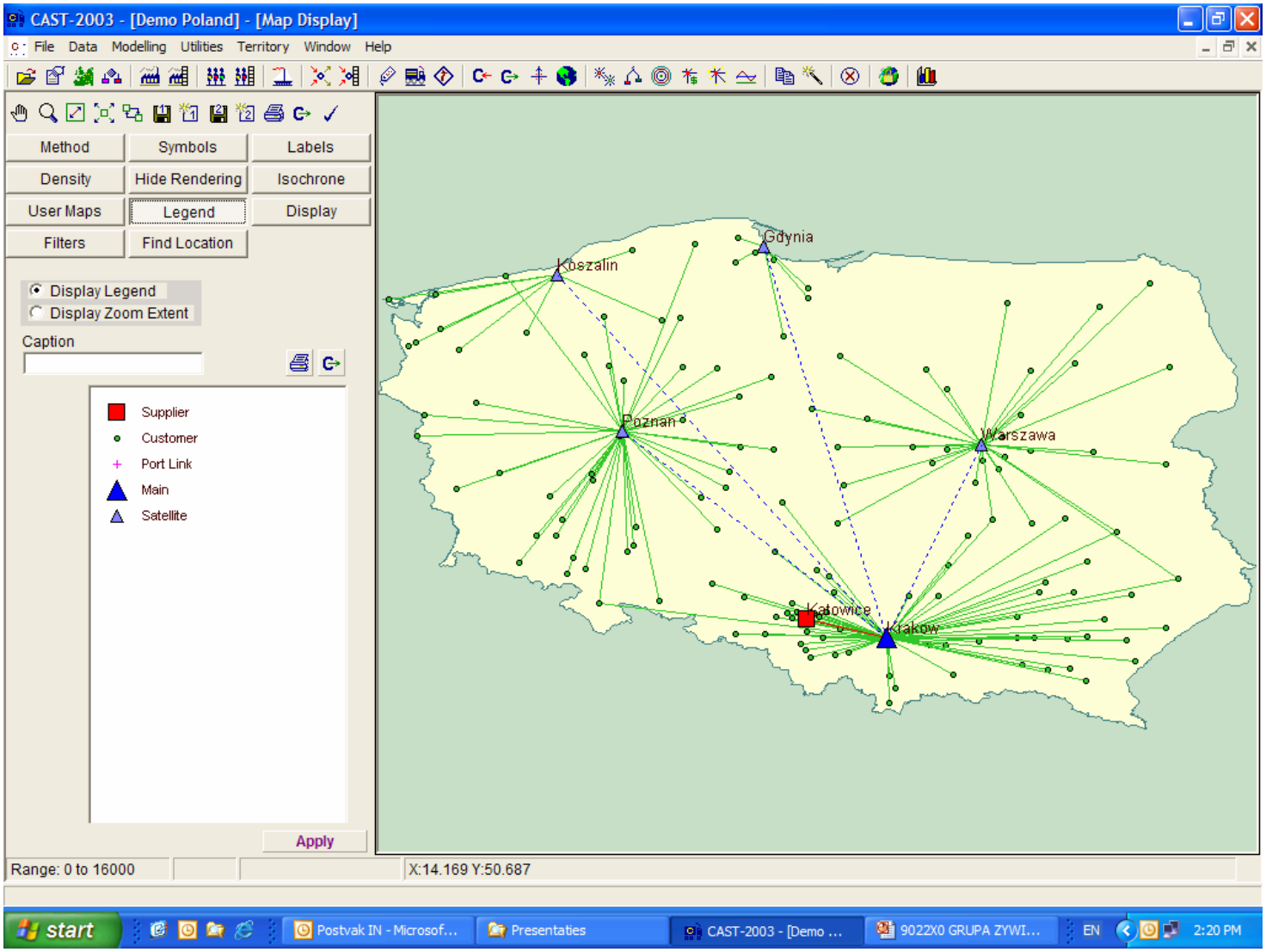
Calculations and results

Example supply chain flow – country focus



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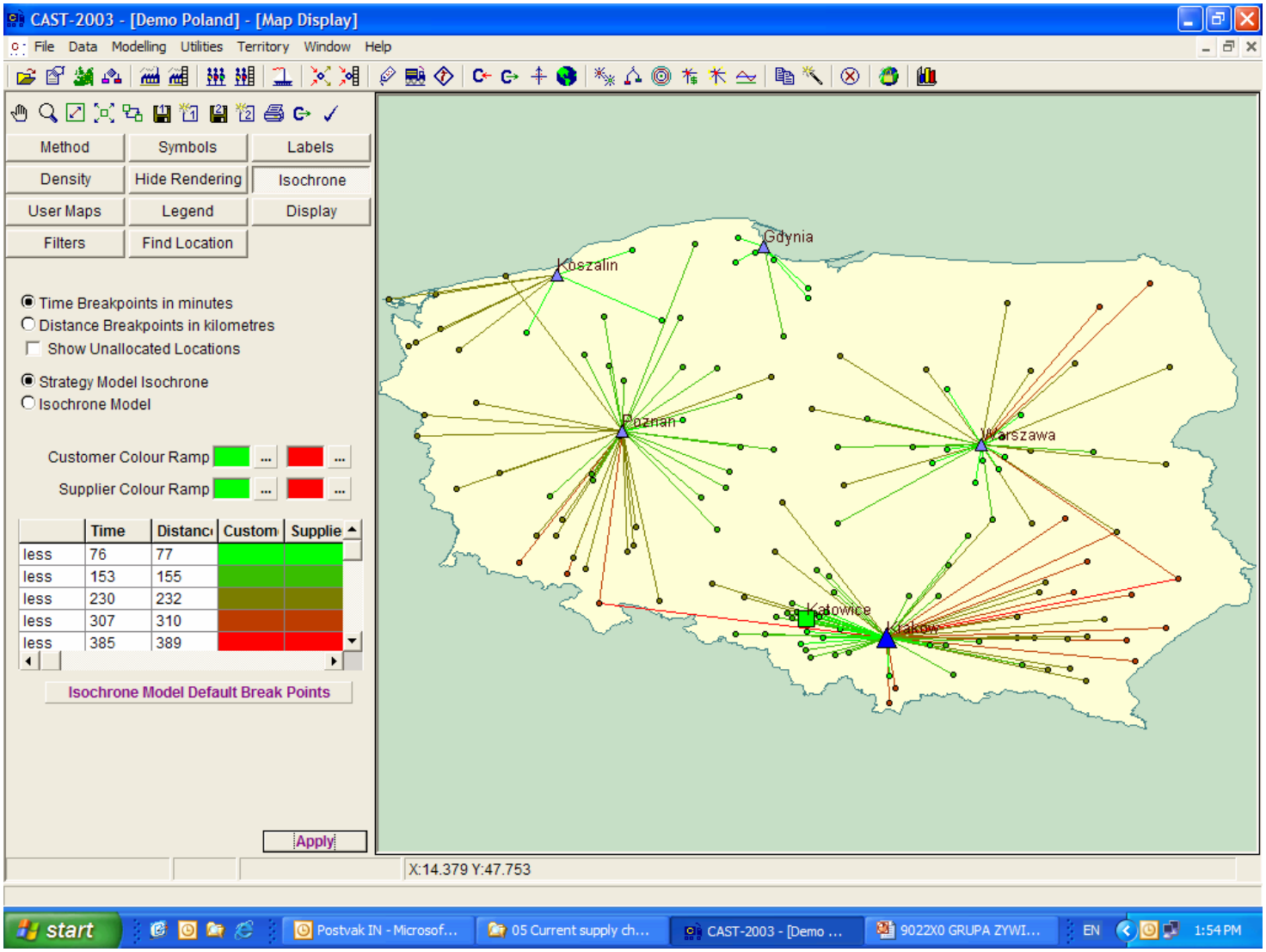
Calculations and results

Example isochrone results – country focus



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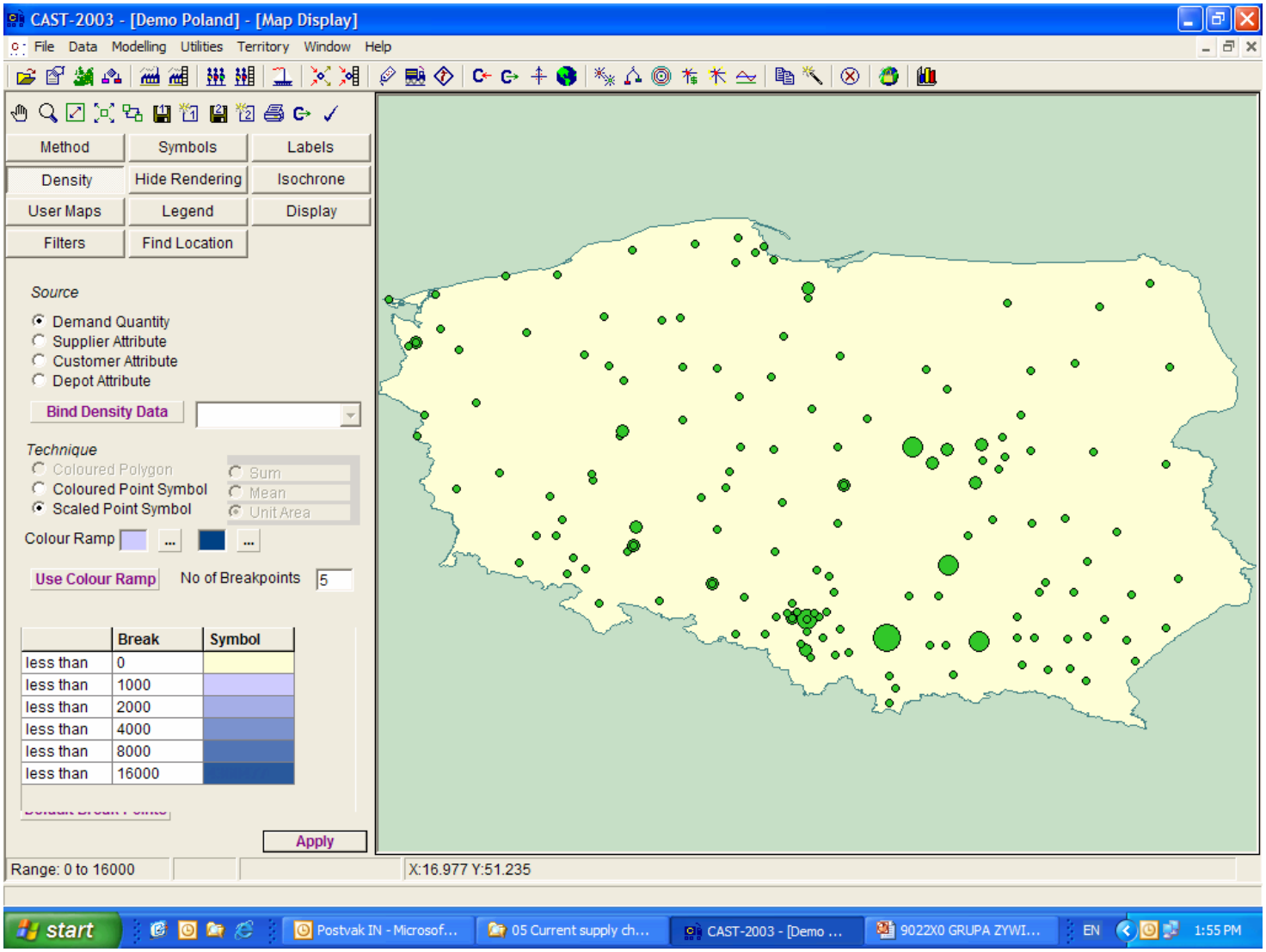
Calculations and results

Example density results – country focus



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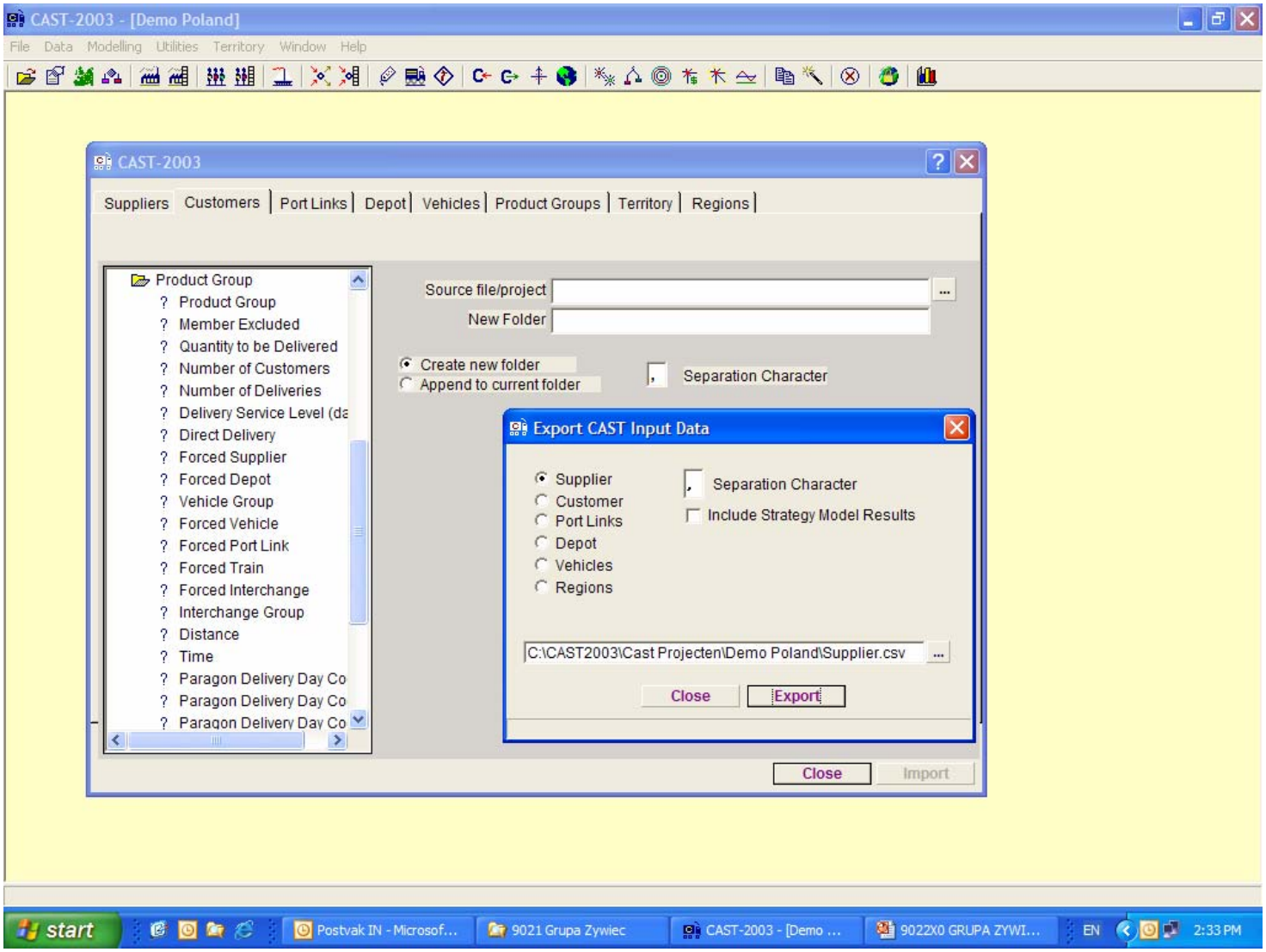
Exporting and importing data

Input and results easy im-/exported to Excel/Access



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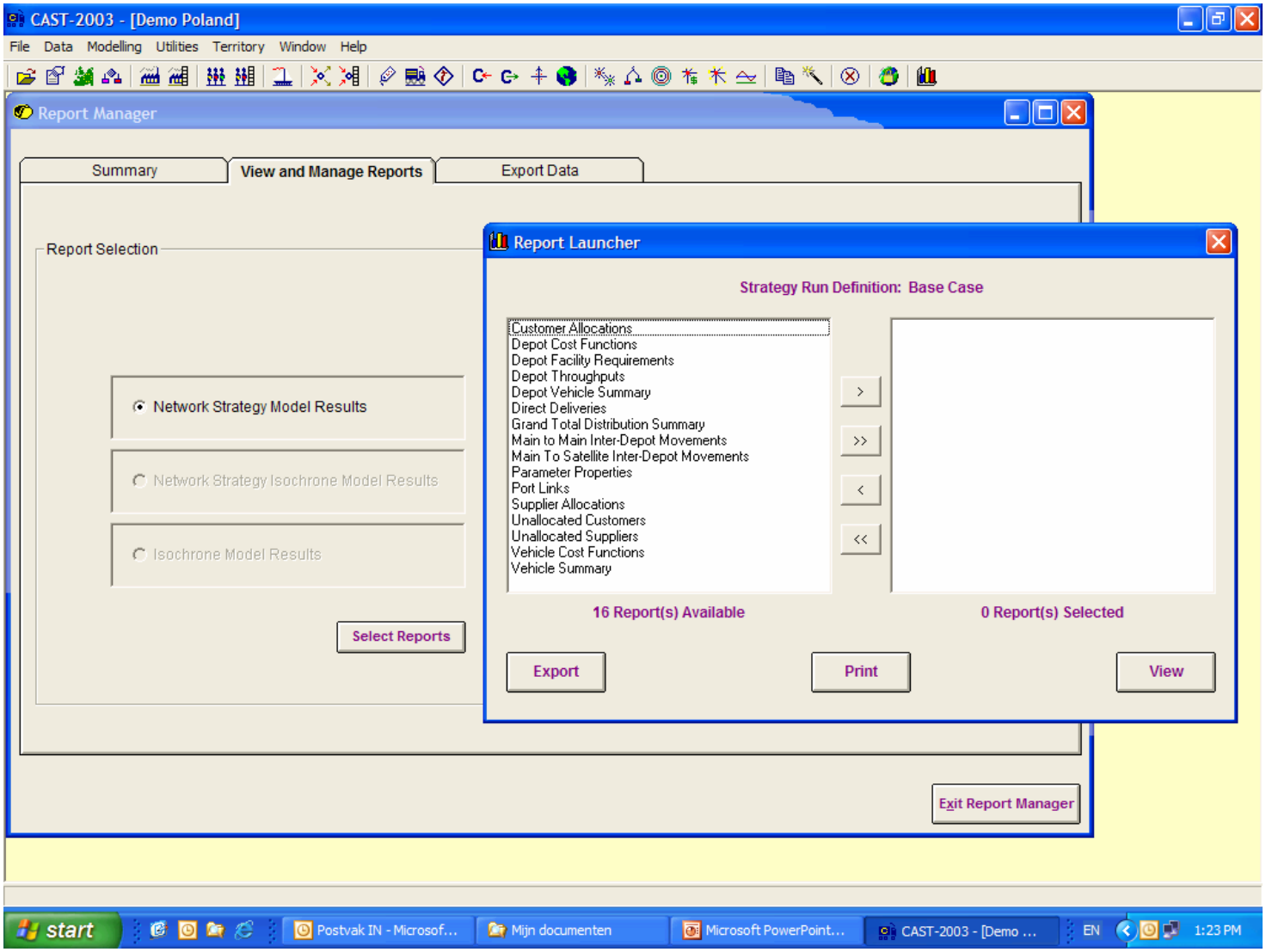
Report Generator

Possible reports to be generated



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Report Generator

Generated customer report

CAST Report Generator

Customer Allocations

100% 8 of 13

- Main Depot Allocations
- Satellite Depot Allocations

Customer Allocations

(Results for Output Time Period)

Depot Allocated: 2 Poznan

Customer Code / Location	Product Group	Quantity	One way Distance	Transport Cost	Stock In Transit Cost	Vehicle	Combined Instance	Port Link Cost	Ap
44- Sztum	PALLETS	36.08	275	299	0	1-Secondary	Single Del	0	
48- Lebork	PALLETS	58.58	132	701	0	1-Secondary	Single Del	0	
79- Kalisz	PALLETS	68.55	118	1,378	0	1-Secondary	Single Del	0	
81- Ostrow Wielkopolski	PALLETS	53.73	121	1,088	0	1-Secondary	Single Del	0	
82- Kalisz	PALLETS	72.99	118	1,289	0	1-Secondary	Single Del	0	
86- Kalisz	PALLETS	188.95	118	3,258	0	1-Secondary	Single Del	0	
89- Kalisz	PALLETS	223.29	118	3,359	0	1-Secondary	Single Del	0	
90- Brochocin	PALLETS	872.51	194	14,239	0	1-Secondary	Single Del	0	
112- Legnica	PALLETS	42.58	194	773	0	1-Secondary	Single Del	0	
113- Wroclaw	PALLETS	172.01	177	3,214	0	1-Secondary	Single Del	0	
114- Jelenia Góra	PALLETS	794.67	264	15,805	0	1-Secondary	Single Del	0	
115- Swidnica	PALLETS	181.51	227	4,137	0	1-Secondary	Single Del	0	
116- Glogów	PALLETS	17.00	123	350	0	1-Secondary	Single Del	0	
117- Legnica	PALLETS	66.38	194	1,345	0	1-Secondary	Single Del	0	
118- Lubin	PALLETS	100.08	170	1,983	0	1-Secondary	Single Del	0	
119- Wroclaw	PALLETS	47.11	177	739	0	1-Secondary	Single Del	0	
120- Wroclaw	PALLETS	87.40	177	1,654	0	1-Secondary	Single Del	0	
121- Wroclaw	PALLETS	50.38	177	674	0	1-Secondary	Single Del	0	
122- Wroclaw	PALLETS	108.55	177	2,349	0	1-Secondary	Single Del	0	
123- Bielany Wroclawskie	PALLETS	37.08	177	594	0	1-Secondary	Single Del	0	
124- Strzegom	PALLETS	656.50	227	12,073	0	1-Secondary	Single Del	0	
126- Legnica	PALLETS	69.45	194	1,415	0	1-Secondary	Single Del	0	
128- Lubin	PALLETS	177.26	170	3,621	0	1-Secondary	Single Del	0	
130- Walbrzych	PALLETS	302.77	249	5,878	0	1-Secondary	Single Del	0	

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Description

Ideal Standard is the world's largest manufacturer of bath & kitchen products. The range of products include: faucets, fixtures, whirlpools, accessories, showers and sinks. Brands include American Standard JADO, Borma, Armitage Shanks, Ceramica Dolomite, Porcher and Ideal Standard.

Opportunities

As a result of several mergers and acquisitions, the "AS-IS" network in Europe contained around 25 distribution centers.

Ideal Standard desired to the optimize its existing European supply chain for fixtures and fittings. The preferred distribution structure should be streamlined:

- Minimize the total distribution costs
- Maximize customer service.

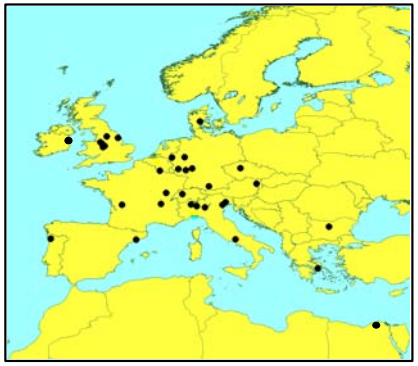
Solution

A detailed analysis of existing distribution network and customer service metrics characteristics was conducted. This provided a critical overview of the current supply chain.

Supply chain simulation models were used to determine the optimal distribution structure: number, location, market region and function of the European distribution centers.

Benefits

- Insight into current supply chain characteristics and performance provided by the systematic analysis
- 15% savings on the total European transportation and warehousing costs were identified.



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JohnsonDiversey
Clean is just the beginning

Description

Supply chain project for JohnsonDiversey, an industry leader in cleaning and hygiene solutions to the institutional and industrial marketplace.

JohnsonDiversey serves customers in the lodging, food services, retail, health care, food and beverage sectors as well as building service contractors worldwide.

Opportunities

Recently, JohnsonDiversey commissioned a business study, resulting in an updated business strategy. In the area of supply chain management JohnsonDiversey defined three main improvement opportunities. JohnsonDiversey management was committed to improve their supply chain in terms of operational costs and optimize their product delivery by detailing and implementing the defined supply chain opportunities.

Solution

Groenewout analyzed different alternative logistics networks for different supply chains.

A sub-regional logistics model was determined to be the optimal solution for chemical products and utensils.

For machines and accessories products a centralized solution with maximization of central stock function and direct shipments was determined to be the optimal solution.

Benefits

- Substantial annual operational cost reduction in total supply chain costs
- Significant decrease of European inventory
- Increased flexibility
- One integrated logistics concept and organization as a shared service.

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Description

Client is a major manufacturer and distributor of food products.

Opportunities

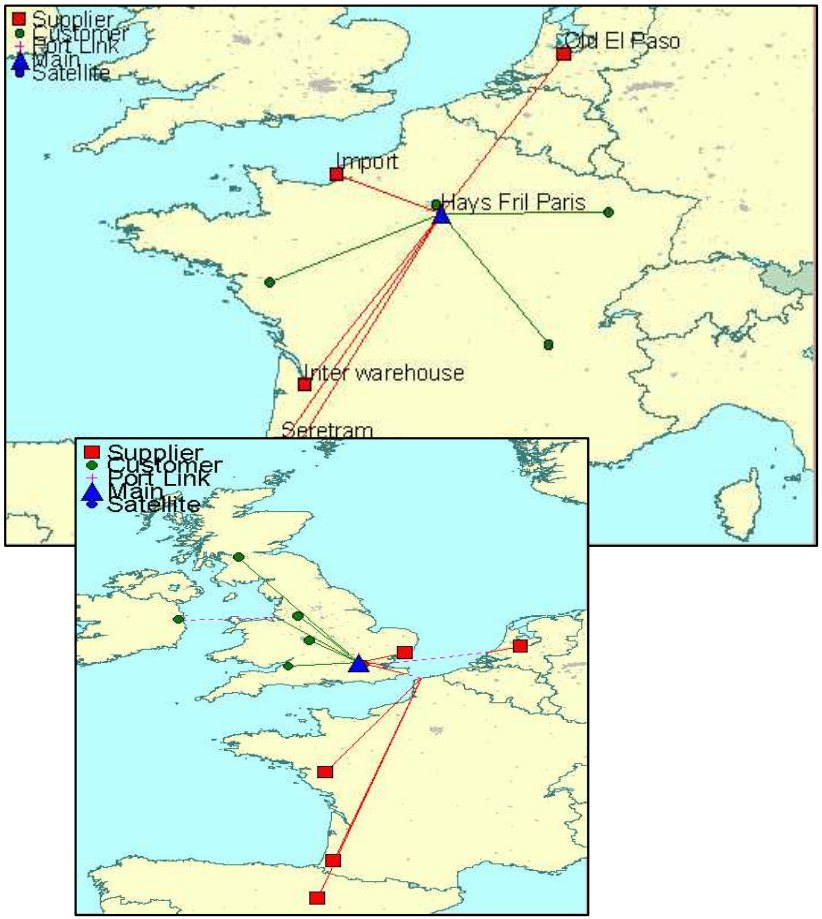
Manufacturer questioned whether their current European supply chain offered opportunities for costs savings.

Solution

After analyzing the supply chain, it was determined that the current supply chain structure was close to optimal. Although no real cost savings were determined, manufacturer viewed the exercise of determining the current supply chain costs provided added value. The study included a scenario in which the finished goods warehouses at the production sites and distribution centers were combined.

Benefits

- Insight into supply chain
- Supply chain model used as a decision support system.



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Description

Nestle Purina PetCare (formerly Friskies) is a producer and distributor of pet food and accessories. Nestle Purina PetCare owns several factories and numerous warehouses in Europe.

Opportunities

Friskies European Logistics team was committed to improve their distribution in terms of performance and costs for the Benelux countries and Germany.

Solution

Groenewout analyzed different alternative distribution networks. Caused by the uniqueness of articles per country market, consolidation per country was determined to be the optimal short term solution.

After executing a benchmark analysis Groenewout proved to Nestle that particular contracts for warehousing were too expensive. The decision was made to contract with one logistics service provider to consolidate the German warehouses.

Groenewout developed a RFP for selecting a new logistics service provider operating in a multi-client environment. Subsequently Groenewout supported Nestle in the development and negotiation of a new service level agreement.

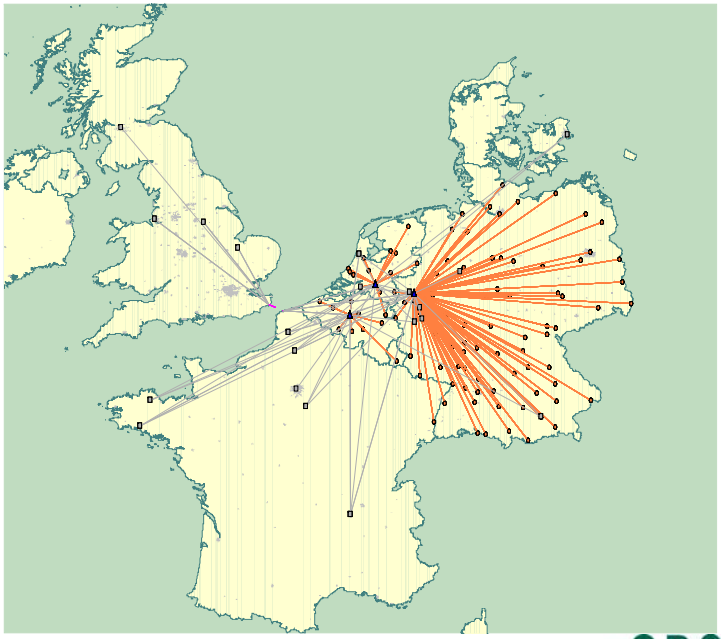
Benefits

The selected service provider proposed:

- 10+% Cost reduction in German warehouse costs
- Increased quality and flexibility

Future opportunities

Creating overlap of articles between countries, product rationalization and changes in product sourcing will reduce the annual logistics costs significantly.



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ESI Polska SP. Zoo. Poland

Description

ESI Polska is a division of Nestlé Waters and distributes mineral waters and other beverages within Poland.

Opportunities

As a result of changing customer's strategies, ESI Polska questioned how to adapt their distribution network in order to meet customer requirements and reduce logistics costs. The high seasonal influences experienced by the company were considered an important issue for the development of the conceptual design.

ESI Polska wanted to identify customer revenue with the order fulfillment costs.

Solution

- Definition of customer service metrics
- Profitability analysis based on the ABC costing methodology
- Optimization of distribution structure through computer simulation. Solution towards centralization of distribution centers proved out to be the best solution for their business
- Identification of quick-wins in logistics costs: transfer and consolidation of distribution channels.

Benefits

- Customer profitability analysis
- Significant cost reduction in warehousing & transport costs
- Optimal distribution network meeting customer requirements
- Quick-wins for savings in distribution
- Implementation plan.

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