

Supply Chain Environmental Analysis Using SEAT™: Case Studies

We have compiled here several examples of supply-chain energy and emissions analysis using the **SEAT™** software offered by **Surya Technologies**. The examples are for illustrative purposes only (and therefore simplified) and show how the SEAT™ software can be used in the environmental analysis and optimization of a wide range of supply chains.

The analyses presented here focus on transportation and storage along supply chains. Each example contains results for the original supply chain as presented in the diagram, and then a second set of results with some of the transport modes and delivery sizes changed. While larger delivery sizes significantly improve the environmental performance in some cases due to more efficient transportation, they do not lead to sufficient improvement in certain other cases because storage costs (energy costs, as well as other inventory-related costs) increase. Changing the characteristics of a transport link also changes inventory levels at both ends of that link, which the SEAT software calculates automatically. SEAT can thus analyze the global environmental impact of local changes to the supply chain.

While production processes are included for completeness, we have not modeled their energy/emissions characteristics in these examples. The results also include the financial cost of operating the supply chain in each case – including energy costs and non-energy costs (transportation overhead costs and inventory carrying costs) – which would allow any environmental performance improvements to be evaluated in the right context.

Each of the following SEAT analysis examples includes a diagram of the supply chain, followed by analysis results for multiple scenarios. Click on the headings below for details. If you have any questions, e-mail us at “contact at suryatechs.com”.

- **AN AUTOMOTIVE SUPPLY CHAIN (WINDSHIELD WIPERS)**
- **A FOOD SUPPLY CHAIN (READY-TO-EAT MEALS)**
- **A VEGETABLE SUPPLY CHAIN (CARROTS)**
- **A CEREAL/GRAIN SUPPLY CHAIN**
- **A DAIRY SUPPLY CHAIN**
- **A PRINTER SUPPLY CHAIN**
- **A RETAIL SUPPLY CHAIN**

An Automotive Supply Chain (Windshield Wipers)

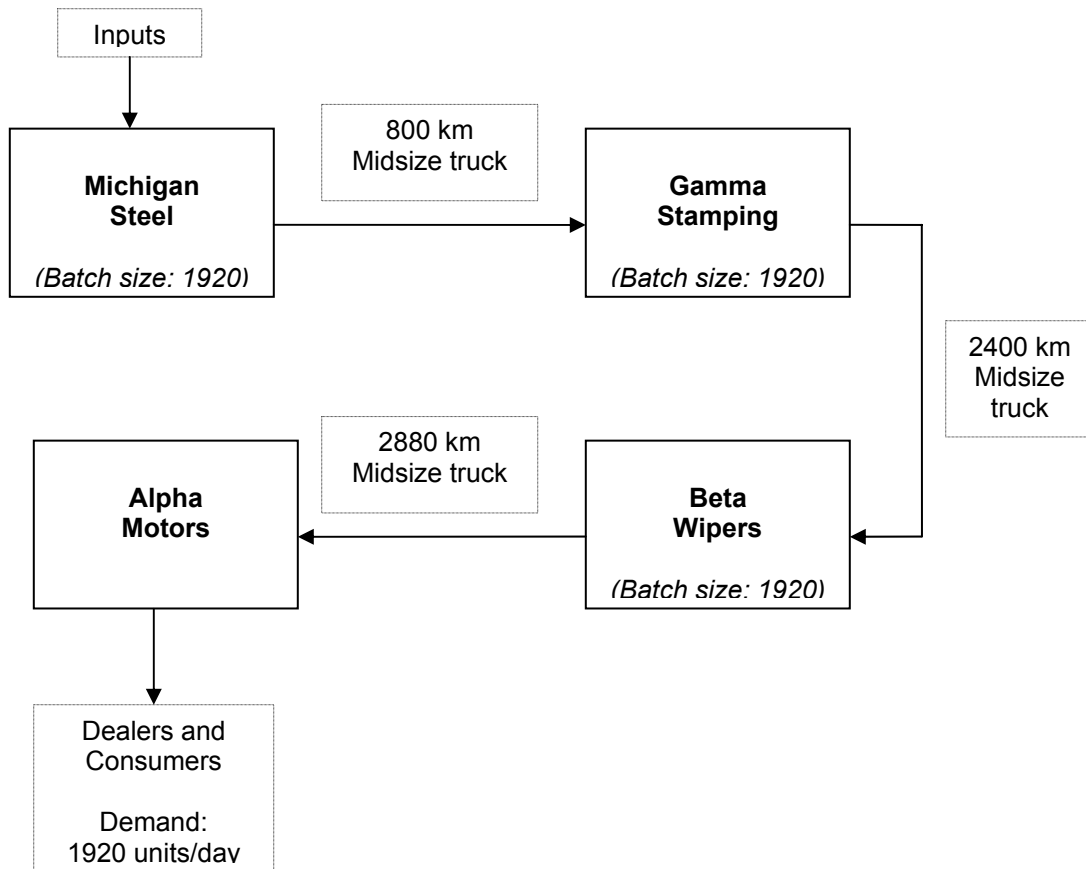
Scenarios analyzed:

- Baseline lean case
- Larger delivery sizes on some transport links

Key Results:

- Larger delivery size produces lower emissions, consumes less fuel/energy, and lowers overall cost

An Automotive Supply Chain (Windshield Wipers)



Adapted from: Jones, D.T. and Womack, J.P. (2002). *Seeing the Whole: Mapping the Extended Value Stream*, The Lean Enterprise Institute, Brookline, MA.

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A Food Supply Chain (Ready-to-eat Meals)

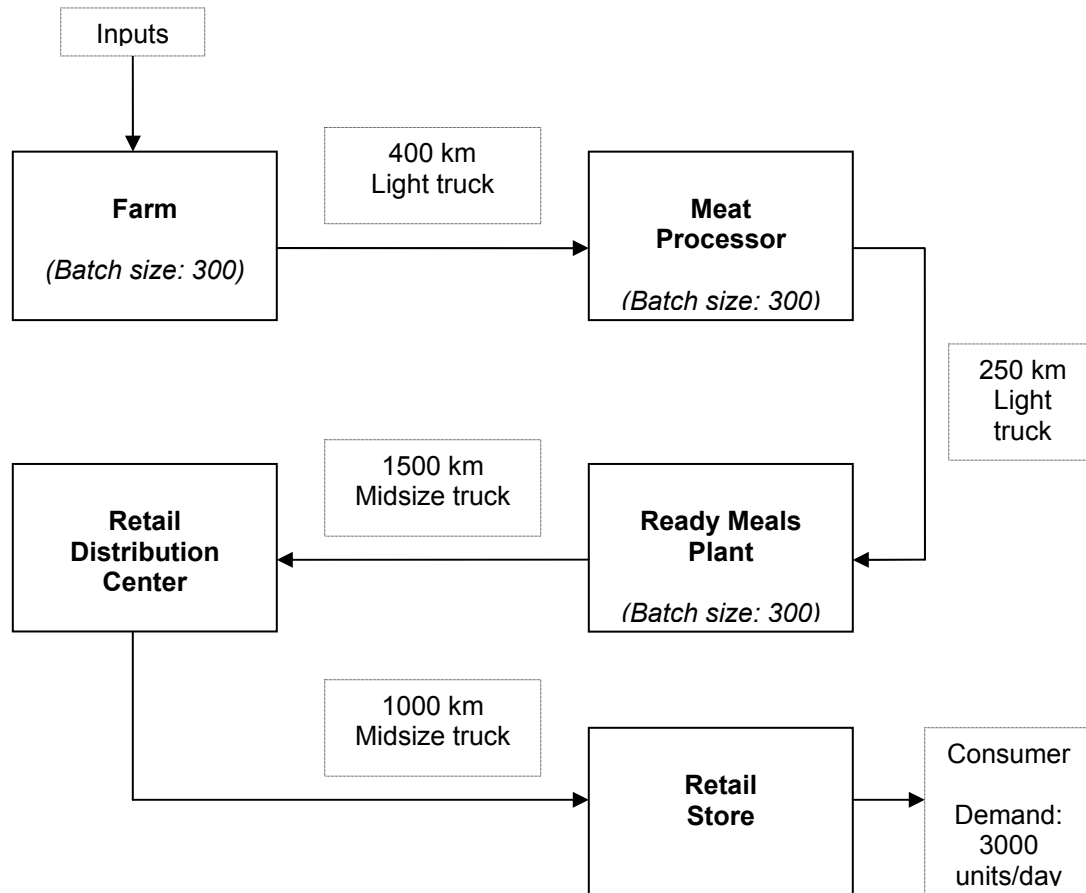
Scenarios analyzed:

- Baseline lean case
- Larger delivery sizes on some transport links

Key Results:

- Larger delivery size produces slightly higher emissions, but lowers the overall cost

A Food Supply Chain (Ready-to-eat Meals)



Adapted from: Simons, D. and Mason, R. (2002). "Environmental and Transport Supply Chain Evaluation with Sustainable Value Stream Mapping," *Proceedings of the 7th Logistics Research Network Conference* Birmingham UK

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A Vegetable Supply Chain (Carrots)

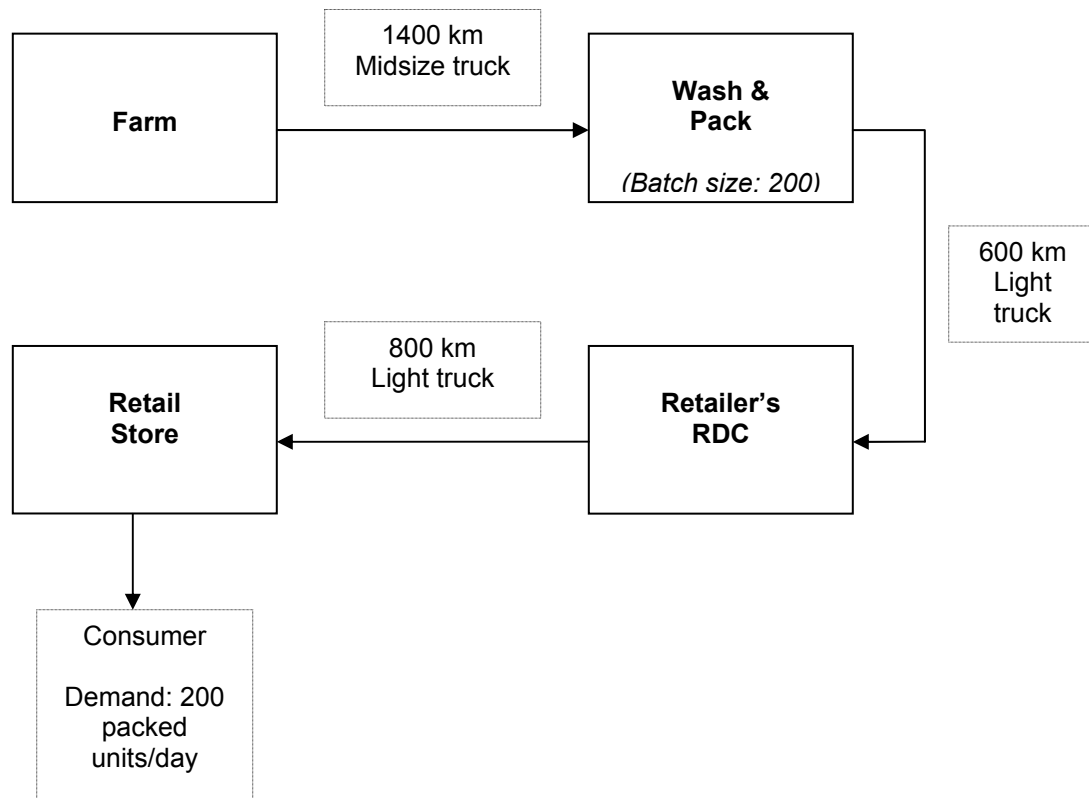
Scenarios analyzed:

- Baseline case
- Larger delivery sizes on some transport links

Key Results:

- Larger delivery size produces slightly higher emissions, but lowers the overall cost

A Vegetable Supply Chain (Carrots)



Adapted from: "More than one in three organic carrots thrown away", a case study of organic vegetables, Food Chain Center, UK, Dec. 2005.

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	Node/Link	Mode	Energy/Fuel	Distance (Km)	Delivery Period (Days)	Batch Size or Ave. Inventory	Energy Used per Day (GJ)	Emissions Generated per Day (Kg-CO2)	Energy/Fuel Cost per Day (\$)	Transportation Overhead Cost per Day (\$)	Storage Overhead Cost per Day (\$)	Total Cost per Day (\$)
	ToWashAndPackIn	MidsizeTruck (Transport)	Diesel	1400.00	5.00	1000.00	2.88	211.64	61.43	84.00		145.43
	ToRetailRDC	LightTruck (Transport)	Gasoline	600.00	0.50	100.00	5.66	385.65	130.20	180.00		310.20
	ToRetailStore	LightTruck (Transport)	Gasoline	800.00	0.50	100.00	7.54	514.20	173.61	240.00		413.61
	WashAndPackIn	ColdStorage (Storage)	Electricity			400.00	2.02	340.64	56.00		25.09	81.09
	WashAndPackOut	ColdStorage (Storage)	Electricity			50.00	1.01	170.32	28.00		25.01	53.01
	RetailRDC	ColdStorage (Storage)	Electricity			0.00	0.86	145.99	24.00		25.00	49.00
	RetailStore	ColdStorage (Storage)	Electricity			49.50	1.01	170.08	27.96		25.04	53.00
	WashAndPack	WP (Process)	None			200.00	0.00	0.00	0.00			0.00
	<TOTAL>						20.97	1938.51	501.20	504.00	100.14	1105.34
►*												



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	Node/Link	Mode	Energy/Fuel	Distance (Km)	Delivery Period (Days)	Batch Size or Ave. Inventory	Energy Used per Day (GJ)	Emissions Generated per Day (Kg-CO2)	Energy/Fuel Cost per Day (\$)	Transportation Overhead Cost per Day (\$)	Storage Overhead Cost per Day (\$)	Total Cost per Day (\$)
	ToWashAndPackIn	MidsizeTruck (Transport)	Diesel	1400.00	5.00	1000.00	2.88	211.64	61.43	84.00		145.43
	ToRetailRDC	MidsizeTruck (Transport)	Diesel	600.00	5.00	1000.00	1.23	90.70	26.33	36.00		62.33
	ToRetailStore	LightTruck (Transport)	Gasoline	800.00	0.50	100.00	7.54	514.20	173.61	240.00		413.61
	WashAndPackIn	ColdStorage (Storage)	Electricity			400.00	2.02	340.64	56.00		25.09	81.09
	WashAndPackOut	ColdStorage (Storage)	Electricity			400.00	2.02	340.64	56.00		25.09	81.09
	RetailRDC	ColdStorage (Storage)	Electricity			450.00	2.16	364.97	60.00		25.20	85.20
	RetailStore	ColdStorage (Storage)	Electricity			49.50	1.01	170.08	27.96		25.04	53.00
	WashAndPack	WP (Process)	None			200.00	0.00	0.00	0.00			0.00
	<TOTAL>						18.85	2032.86	461.32	360.00	100.42	921.74
►*												



A Cereal/Grain Supply Chain

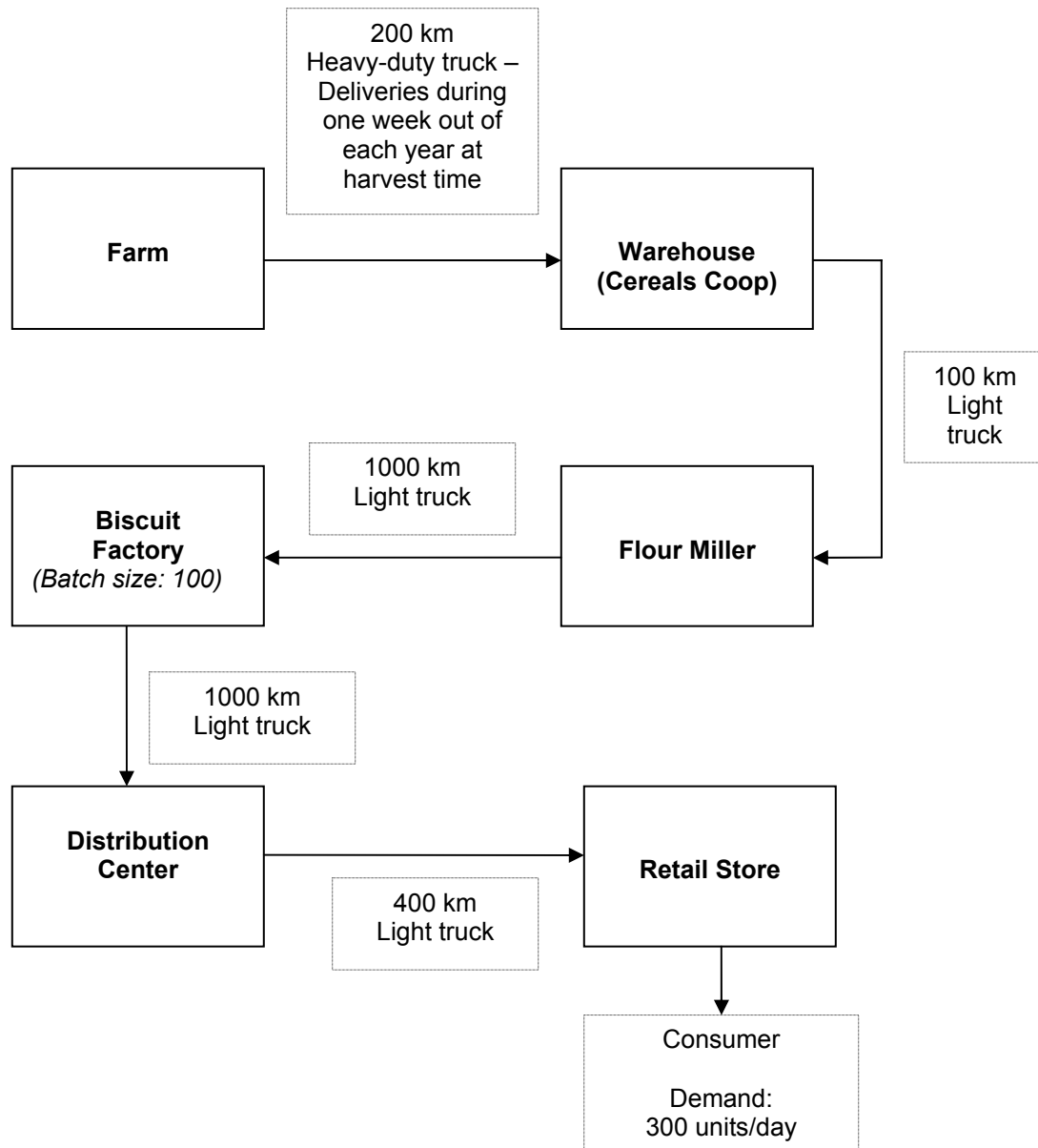
Scenarios analyzed:

- Baseline case
- Larger delivery sizes on some transport links
- Note that all the grain harvested at the farm is transported to the warehouse during one week out of each year, and then supplied from the warehouse to the downstream production and distribution centers

Key Results:

- Larger delivery size produces lower emissions, consumes less fuel and reduces overall cost

A Cereal/Grain Supply Chain



Adapted from: "Smoothing the flow of cereals through the chain", a case study of United Biscuits, Food Chain Center, UK, Oct. 2005.

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	Node/Link	Mode	Energy/Fuel	Distance (Km)	Delivery Period (Days)	Batch Size or Ave. Inventory	Energy Used per Day (GJ)	Emissions Generated per Day (Kg-CO2)	Energy/Fuel Cost per Day (\$)	Transportation Overhead Cost per Day (\$)	Storage Overhead Cost per Day (\$)	Total Cost per Day (\$)
	ToWarehouse	HeavydutyTruck (Transport)	Diesel	200.00	0.14	3000.00	0.38	28.02	8.13	11.97		20.10
	ToMiller	LightTruck (Transport)	Gasoline	100.00	0.25	100.00	1.88	128.23	43.29	59.85		103.14
	ToBiscuitFactoryIn	LightTruck (Transport)	Gasoline	1000.00	0.25	100.00	18.80	1282.28	432.93	598.50		1031.43
	ToDistributionCenter	LightTruck (Transport)	Gasoline	1000.00	0.33	100.00	14.14	964.12	325.51	450.00		775.51
	ToRetailStore	LightTruck (Transport)	Gasoline	400.00	0.33	100.00	5.66	385.65	130.20	180.00		310.20
	Warehouse	Warehouse (Storage)	Electricity			72736.02	0.09	14.60	2.40		1.61	4.01
	Miller	StdStorage (Storage)	Electricity			0.00	4.32	729.94	120.00		25.00	145.00
	BiscuitFactoryIn	StdStorage (Storage)	Electricity			0.00	4.32	729.94	120.00		25.00	145.00
	BiscuitFactoryOut	StdStorage (Storage)	Electricity			0.00	4.32	729.94	120.00		25.00	145.00
	DistributionCenter	StdStorage (Storage)	Electricity			0.00	4.32	729.94	120.00		25.00	145.00
	BiscuitFactory	BiscuitProduction (Process)	None			100.00	0.00	0.00	0.00			0.00
	<TOTAL>						58.23	5722.64	1422.47	1300.32	101.61	2824.40
►*												



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A Dairy Supply Chain

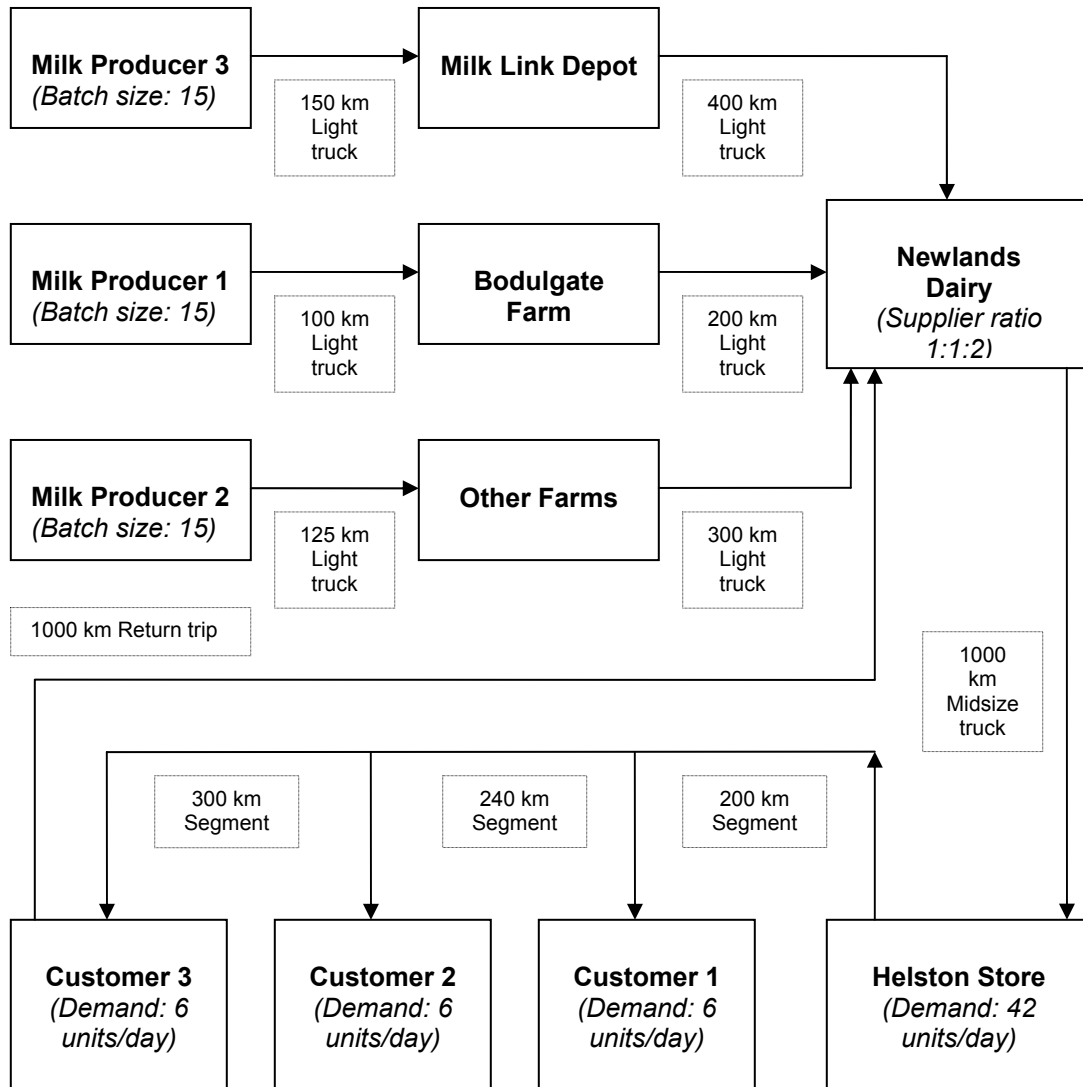
Scenarios analyzed:

- Baseline case with daily deliveries
- Larger delivery sizes on some transport links
- Note that the delivery by truck from the dairy to a retail store and other customers follows a specific route

Key Results:

- Larger delivery size produces *increases* emissions, fuel/energy use, and cost. Since the product (milk) is perishable and requires refrigeration, it is actually better to deliver smaller quantities more frequently and synchronize the deliveries with the daily production schedule.

A Dairy Supply Chain



Adapted from: "Building a new milk brand", a case study, Food Chain Center, UK, June 2005.

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A Printer Supply Chain

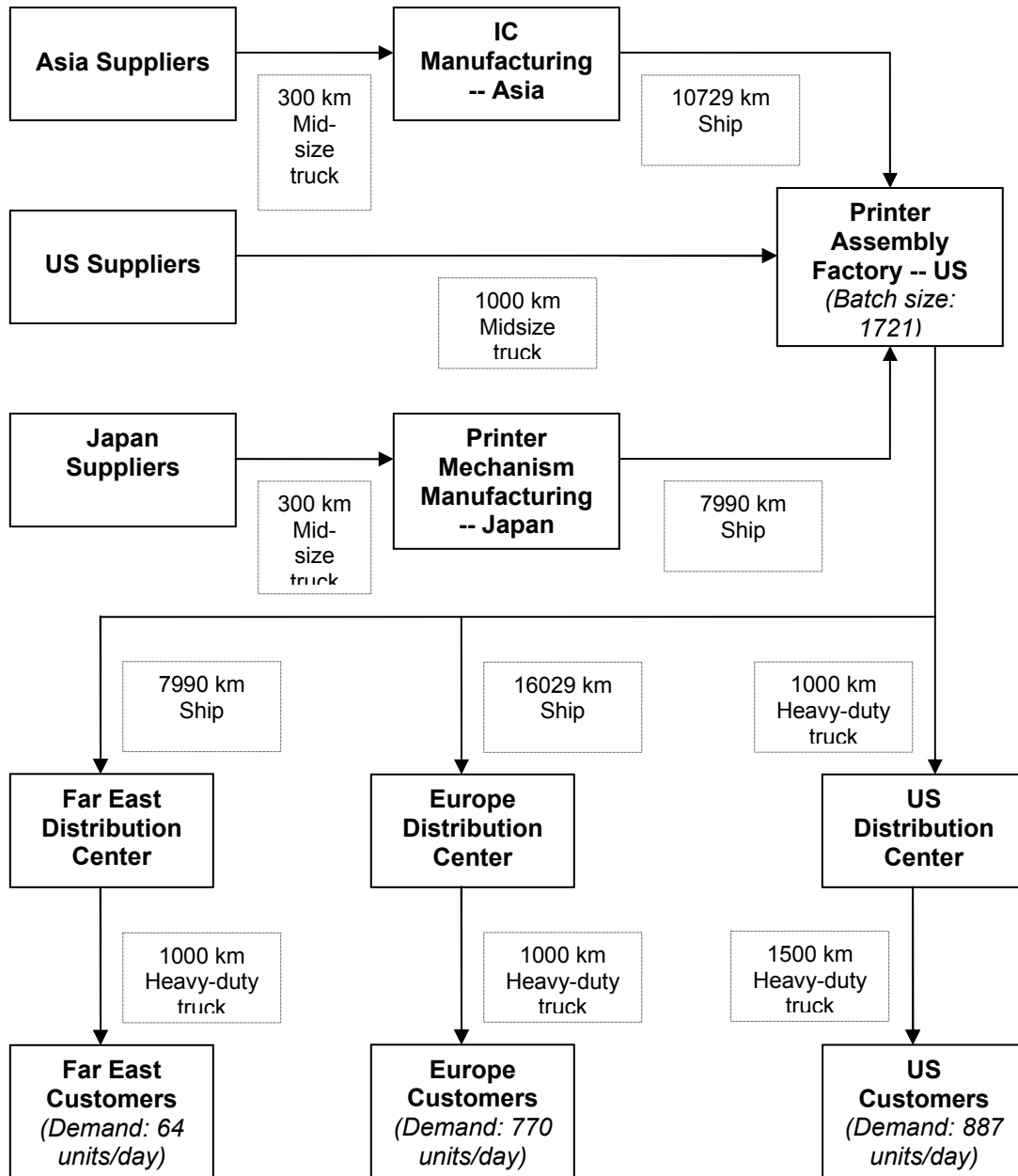
Scenarios analyzed:

- Baseline case with
- Larger delivery sizes on some transport links
- Air freight added to expedite 5% of the shipments on one link

Key Results:

- Larger delivery size produces lower emissions, consumes less fuel and reduces overall cost.
- Air freight increases both emissions and cost, but larger delivery sizes on other transport links can compensate for this.

A Printer Supply Chain



Adapted from: "Hewlett Packard Company DeskJet Printer Supply Chain", a case study, Stanford University, 1994 (published by Harvard Business Review).

NodeOrLink	Mode	EnergyOrFuelType	Distance-Km	DeliveryPeriod-Days	BatchSizeOrAvlInventory	EnergyUsedPerDay-GJ	FuelUsedPerDay-L-Kg-CuM-Kwh-GJ	EmissionsGeneratePerDay-Kg-CO2	EnergyOrFuelCostPerDay-Dollars	TransportationOverheadCostPerDay-Dollars	StorageOverheadCostPerDay-Dollars	TotalCostPerDay-Dollars
TachMgIn	MobileTruck (Transport)	Diesel	300.00	0.35	600.00	8.84	238.36	650.43	188.76	120.08		317.85
TachNewAssyIn1	Ship (Transport)	Diesel	10779.00	6.97	12000.00	21.01	566.25	1545.17	448.47	46.16		494.63
TachNewAssyIn2	MobileTruck (Transport)	Diesel	1000.00	0.35	600.00	29.48	794.51	2168.09	629.27	430.25		1059.52
TachMgIn1	MobileTruck (Transport)	Diesel	300.00	0.35	600.00	8.84	238.36	650.43	188.76	120.08		317.85
TachNewAssyIn3	Ship (Transport)	Diesel	7990.00	6.97	12000.00	15.64	421.49	1150.70	333.98	34.38		368.36
TachDC	HeavyDutyTruck (Transport)	Diesel	1000.00	2.03	1800.00	7.06	192.21	538.66	150.46	147.63		298.08
TachLumpDC	Ship (Transport)	Diesel	16020.00	15.58	12000.00	14.04	378.50	1032.84	299.77	30.88		330.63
TachEastDC	Ship (Transport)	Diesel	7990.00	46.88	3600.00	0.98	15.86	42.75	12.42	5.11		17.53
TachCustomers	HeavyDutyTruck (Transport)	Diesel	1000.00	2.03	1800.00	10.59	285.32	778.57	225.97	233.75		447.72
TachEastCustomers	HeavyDutyTruck (Transport)	Diesel	1000.00	2.34	1800.00	6.13	161.12	450.98	130.78	128.33		259.11
TachEastCustomers	HeavyDutyTruck (Transport)	Diesel	1000.00	28.13	1800.00	0.51	13.72	37.45	10.67	10.67		21.34
uMgIn	Warehouse (Transport)	None				1078.22	0.00	0.00	0.00		4.74	4.74
uMgOut	Warehouse (Transport)	None				5122.71	0.00	0.00	0.00		22.54	22.54
MechMgIn	Warehouse (Transport)	None				1078.22	0.00	0.00	0.00		4.74	4.74
MechMgOut	Warehouse (Transport)	None				5122.71	0.00	0.00	0.00		22.54	22.54
PrinterAssyIn1	Warehouse (Transport)	None				5128.22	0.00	0.00	0.00		22.81	22.81
PrinterAssyIn2	Warehouse (Transport)	None				1078.22	0.00	0.00	0.00		4.74	4.74
PrinterAssyIn3	Warehouse (Transport)	None				5128.22	0.00	0.00	0.00		22.81	22.81
PrinterAssyOut	Warehouse (Transport)	None				7428.81	0.00	0.00	0.00		32.82	32.82
uDC	Warehouse (Transport)	None				6.00	0.00	0.00	0.00		0.00	0.00
EuropeDC	Warehouse (Transport)	None				6300.00	0.00	0.00	0.00		27.72	27.72
FarEastDC	Warehouse (Transport)	None				1800.00	0.00	0.00	0.00		7.92	7.92
uMg	uMg (Process)	None				1721.00	0.00	0.00	0.00		0.00	0.00
MechMg	MechMg (Process)	None				1721.00	0.00	0.00	0.00		0.00	0.00
PrinterAssy	PrinterAssy (Process)	None					0.00	0.00	0.00			0.00
TOTAL						122.72	0.00	9036.10	2610.73	1313.49	173.98	4096.61

NodeOrLink	Mode	EnergyOrFuelType	Distance-Km	DeliveryPeriod-Days	BatchSizeOrVolumeInventory	EnergyUsedPerDay-GJ	FuelUsedPerDay-L-Kg-CuM-Kwh-GJ	EmissionsGeneratedPerDay-Kg-CO2	EnergyOrFuelCostPerDay-Dollars	TransportationOverheadCostPerDay-Dollars	StorageOverheadCostPerDay-Dollars	TotalCostPerDay-Dollars
TachMgIn	HeavyDutyTruck (Transport)	Diesel	300.00	1.05	1800.00	4.11	110.72	302.12	87.69			173.74
TachNewAssyIn1	Ship (Transport)	Diesel	10779.00	6.97	12000.00	21.01	566.25	1545.17	446.47			494.63
TachNewAssyIn2	HeavyDutyTruck (Transport)	Diesel	1000.00	1.05	1800.00	13.69	369.04	1007.08	292.29			579.13
TachMgIn1	HeavyDutyTruck (Transport)	Diesel	300.00	1.05	1800.00	4.11	110.72	302.12	87.69			173.74
TachNewAssyIn3	Ship (Transport)	Diesel	7990.00	6.97	12000.00	15.64	421.49	1150.70	333.98			368.36
TachDC	HeavyDutyTruck (Transport)	Diesel	1000.00	2.03	1800.00	7.96	192.21	538.66	150.46			298.48
TachLumpDC	Ship (Transport)	Diesel	14020.00	15.58	12000.00	14.04	378.50	1032.84	299.77			330.63
TachFastDC	Ship (Transport)	Diesel	7990.00	46.88	3000.00	0.98	15.86	42.75	12.42			17.50
TachCustomers	HeavyDutyTruck (Transport)	Diesel	1000.00	2.03	1800.00	10.59	285.32	778.57	225.97			447.72
TachLumpCustomers	HeavyDutyTruck (Transport)	Diesel	1000.00	2.34	1800.00	6.13	165.12	450.98	130.78			259.11
TachFastCustomers	HeavyDutyTruck (Transport)	Diesel	1000.00	28.13	1800.00	0.51	13.72	37.45	10.67			21.54
uMgIn	Warehouse (Transport)	None			1674.94	0.00	0.00	0.00	0.00	7.37		7.37
uMgOut	Warehouse (Transport)	None			5122.71	0.00	0.00	0.00	0.00	22.54		22.54
MechMgIn	Warehouse (Transport)	None			1674.94	0.00	0.00	0.00	0.00	7.37		7.37
MechMgOut	Warehouse (Transport)	None			5122.71	0.00	0.00	0.00	0.00	22.54		22.54
PrinterAssyIn1	Warehouse (Transport)	None			5128.22	0.00	0.00	0.00	0.00	22.81		22.81
PrinterAssyIn2	Warehouse (Transport)	None			1674.94	0.00	0.00	0.00	0.00	7.37		7.37
PrinterAssyIn3	Warehouse (Transport)	None			5128.22	0.00	0.00	0.00	0.00	22.81		22.81
PrinterAssyOut	Warehouse (Transport)	None			7428.81	0.00	0.00	0.00	0.00	32.82		32.82
uDC	Warehouse (Transport)	None			6300.00	0.00	0.00	0.00	0.00	0.00		0.00
EuropeDC	Warehouse (Transport)	None			1860.00	0.00	0.00	0.00	0.00	27.72		27.72
FarEastDC	Warehouse (Transport)	None			1860.00	0.00	0.00	0.00	0.00	7.92		7.92
uMg	uMg (Process)	None			1721.00	0.00	0.00	0.00	0.00	0.00		0.00
MechMg	MechMg (Process)	None			1721.00	0.00	0.00	0.00	0.00	0.00		0.00
PrinterAssy	PrinterAssy (Process)	None				0.00	0.00	0.00	0.00	0.00		0.00
TOTAL						97.46		7168.48	2080.58	1084.02	181.26	3345.86

NodeOrLink	Mode	EnergyOrFuelType	Distance-Km	DeliveryPeriod-Days	BatchSizeOrMaxInventory	EnergyUsedPerDay-GJ	FuelUsedPerDay-L-Kg-CuM-Kwh-GJ	EmissionsGeneratedPerDay-Kg-CO2	EnergyOrFuelCostPerDay-Dollars	TransportationOverheadCostPerDay-Dollars	StorageOverheadCostPerDay-Dollars	TotalCostPerDay-Dollars
TachMgn	HeavyDutyTruck (Transport)	Diesel	300.00	1.05	1800.00	4.11	110.72	302.12	87.69	86.05		173.74
TaPhNewAssyIn1	Ship (Transport)	Diesel	10779.00	6.97	12000.00	21.01	566.26	1545.17	446.47	46.58		493.05
TaPhNewAssyIn2	HeavyDutyTruck (Transport)	Diesel	1000.00	1.05	1800.00	13.69	369.06	1007.08	292.29	286.83		579.13
TaMechMgn	HeavyDutyTruck (Transport)	Diesel	300.00	1.05	1800.00	4.11	110.72	302.12	87.69	86.05		173.74
TaPhNewAssyIn3	Ship (Transport)	Diesel	7990.00	6.97	12000.00	15.64	421.69	1150.70	333.98	34.38		368.36
TaJnDC	HeavyDutyTruck (Transport)	Diesel	1000.00	2.03	1800.00	7.06	190.21	538.66	150.46	147.83		298.29
TaJnLangDC	Ship (Transport)	Diesel	16020.00	16.40	12000.00	13.34	359.57	981.20	284.78	29.33		314.10
TaJnLangDCByAir	Air (Transport)	JetFuel	16020.00	2.40	100.00	36.41	794.23	1863.09	629.03	1193.81		1798.84
TaFarEastDC	Ship2 (Transport)	Diesel	7990.00	46.98	3000.00	0.58	16.48	42.78	12.42	5.11		17.53
TaJnCustomers	HeavyDutyTruck (Transport)	Diesel	1500.00	2.03	1800.00	10.59	285.32	778.57	225.97	221.75		447.72
TaJnFarEastCustomers	HeavyDutyTruck (Transport)	Diesel	1000.00	2.34	1800.00	6.11	165.12	450.58	130.78	128.33		259.11
TaJnFarEastCustomers	HeavyDutyTruck (Transport)	Diesel	1000.00	26.13	1800.00	0.51	13.72	37.45	10.87	10.87		21.54
icMfgIn	Warehouse (Transport)	None				0.00	0.00	0.00	0.00	7.37		7.37
icMfgCut	Warehouse (Transport)	None				0.00	0.00	0.00	0.00	22.84		22.84
icMfgMgn	Warehouse (Transport)	None				0.00	0.00	0.00	0.00	7.37		7.37
icMfgMgnCut	Warehouse (Transport)	None				0.00	0.00	0.00	0.00	22.84		22.84
PrinterAssyIn1	Warehouse (Transport)	None				0.00	0.00	0.00	0.00	22.81		22.81
PrinterAssyIn2	Warehouse (Transport)	None				0.00	0.00	0.00	0.00	7.37		7.37
PrinterAssyIn3	Warehouse (Transport)	None				0.00	0.00	0.00	0.00	22.81		22.81
PrinterAssyCut	Warehouse (Transport)	None				0.00	0.00	0.00	0.00	31.11		31.11
LnDC	Warehouse (Transport)	None				0.00	0.00	0.00	0.00	0.00		0.00
LnDC	Warehouse (Transport)	None				0.00	0.00	0.00	0.00	22.76		22.76
FarEastDC	Warehouse (Transport)	None				0.00	0.00	0.00	0.00	7.92		7.92
icMfg	icMfg (Process)	None				0.00	0.00	0.00	0.00	0.00		0.00
icMfgMgn	icMfgMgn (Process)	None				0.00	0.00	0.00	0.00	0.00		0.00
PrinterAssy	PrinterAssy (Process)	None				0.00	0.00	0.00	0.00	0.00		0.00
TOTAL						132.17		8979.93	2694.62	2193.29	176.59	5064.50

A Retail Supply Chain

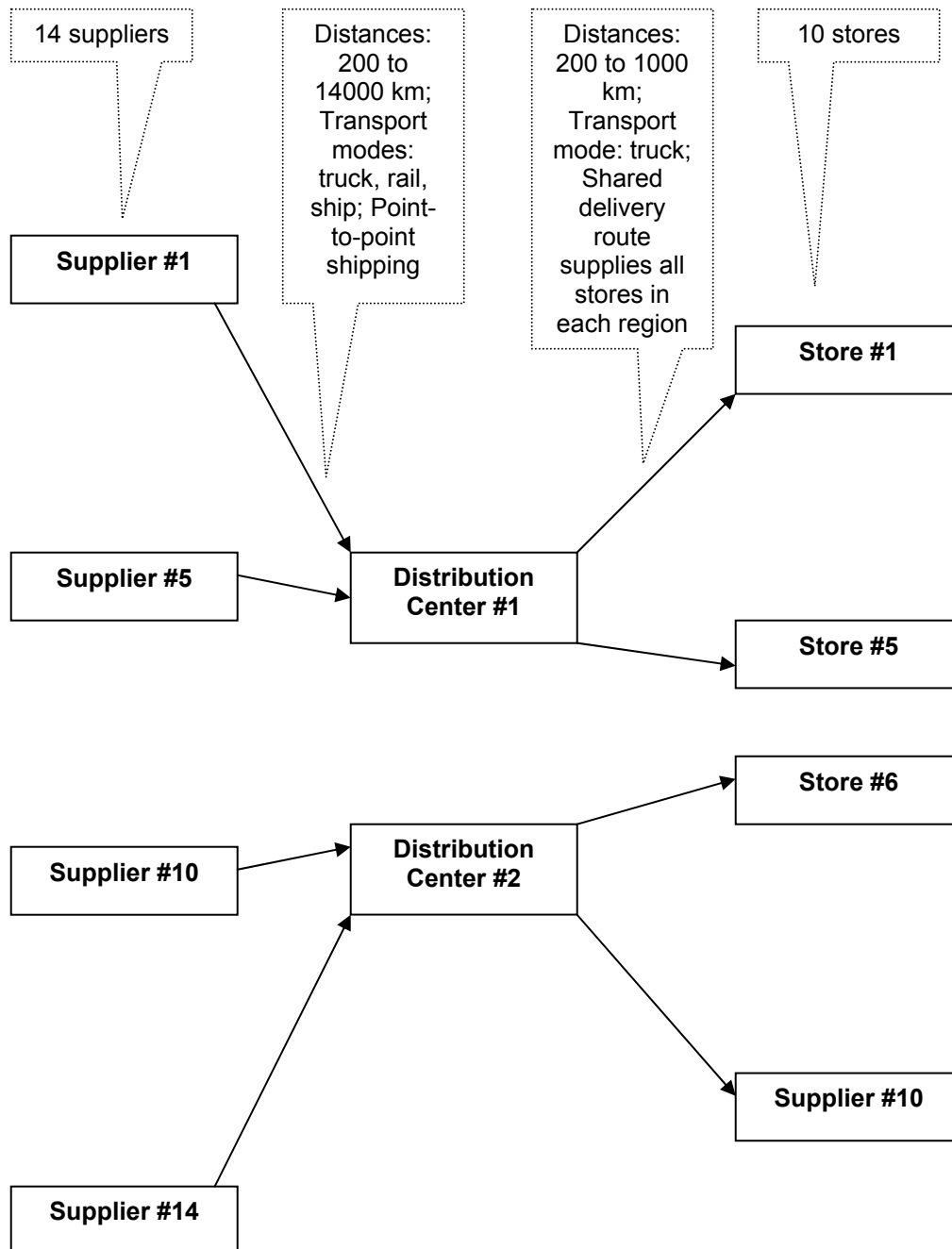
Scenarios analyzed:

- Total of six cases:
 - Baseline case
 - Larger delivery sizes on all road transport links
 - Above two cases repeated with increased cold storage requirements
 - Last two cases repeated with smaller distances on all road transport links
- Note: Transport via rail or ship uses a relatively small portion of the transport mode's capacity, so these shipments are specified as the number of units shipped (essentially a "package size") rather than the percentage of the transport mode's capacity.

Key Results:

- Emissions, energy use and cost all generally decrease with larger delivery sizes
- With increased cold storage requirements (which increases energy use in storage): emissions, energy use and cost all increase with larger delivery sizes
- With smaller distances and cold storage requirements, smaller delivery sizes perform much better than larger delivery sizes

A Retail Supply Chain



NodeOrLink	Mode	EnergyOrFuelType	Distance-Km	DeliveryPeriod-Days	BatchSizeOrAveInventory	EnergyUsedPerDay-GJ	FuelUsedPerDay-L-Kg-Cum-Kwh-GJ	EmissionsGeneratedPerDay-Kg-CO2	EnergyOrFuelCostPerDay-Dollars	TransportationOverheadCostPerDay-Dollars	StorageOverheadCostPerDay-Dollars	TotalCostPerDay-Dollars
Supplier1-To-Dct1	Ship-LargeTanker (Transport)	BunkerFuel	14000.00	40.00	200000.00	2.72	67.06	209.84	46.94			53.24
Supplier2-To-Dct1	MidsizeTruck (Transport)	Diesel	800.00	1.20	6000.00	5.96	190.67	441.15	112.47			212.47
Supplier3-To-Dct1	MidsizeTruck (Transport)	Diesel	1200.00	1.20	6000.00	8.94	241.00	661.73	168.70			338.70
Supplier4-To-Dct1	MidsizeTruck (Transport)	Diesel	1600.00	1.20	6000.00	11.92	321.33	882.31	224.93			424.93
Supplier5-To-Dct1	MidsizeTruck (Transport)	Diesel	2000.00	1.20	6000.00	14.90	401.67	1102.88	281.17			531.17
Supplier6-To-Dct1	MidsizeTruck (Transport)	Diesel	2400.00	1.20	6000.00	17.88	482.00	1323.46	337.40			637.40
Supplier7-To-Dct1	MidsizeTruck (Transport)	Diesel	2800.00	1.20	6000.00	20.86	562.33	1544.04	393.63			743.63
Supplier8-To-Dct1	MidsizeTruck (Transport)	Diesel	3200.00	1.20	6000.00	23.84	642.67	1764.61	449.87			849.87
Supplier9-To-Dct1	MidsizeTruck (Transport)	Diesel	3600.00	1.20	6000.00	26.82	723.00	1985.19	506.10			956.10
Supplier10-To-Dct1	Rail (Transport)	Diesel	2000.00	6.00	30000.00	4.05	109.25	299.08	76.48			166.48
Supplier5-To-Dct2	MidsizeTruck (Transport)	Diesel	2000.00	1.20	6000.00	14.90	401.67	1102.88	281.17			531.17
Supplier7-To-Dct2	MidsizeTruck (Transport)	Diesel	3200.00	1.20	6000.00	23.84	642.67	1764.61	449.87			849.87
Supplier9-To-Dct2	MidsizeTruck (Transport)	Diesel	3600.00	1.20	6000.00	26.82	723.00	1985.19	506.10			956.10
Supplier5-To-Dct3	MidsizeTruck (Transport)	Diesel	2400.00	1.20	6000.00	17.88	482.00	1323.46	337.40			637.40
Supplier10-To-Dct3	MidsizeTruck (Transport)	Diesel	2800.00	1.20	6000.00	20.86	562.33	1544.04	393.63			743.63
Supplier11-To-Dct3	MidsizeTruck (Transport)	Diesel	3200.00	1.20	6000.00	23.84	642.67	1764.61	449.87			849.87
Supplier12-To-Dct3	MidsizeTruck (Transport)	Diesel	3600.00	1.20	6000.00	26.82	723.00	1985.19	506.10			956.10
Supplier13-To-Dct3	MidsizeTruck (Transport)	Diesel	400.00	1.20	6000.00	5.96	190.67	441.15	112.47			212.47
Supplier14-To-Dct3	Ship-LargeTanker (Transport)	BunkerFuel	14000.00	40.00	200000.00	2.72	67.06	209.84	46.94			53.24
Dct1-To-Store1	MidsizeTruck (Transport)	Diesel	400.00	0.12	1200.00	14.90	401.67	1102.88	281.17			531.17
Dct1-To-Store2	MidsizeTruck (Transport)	Diesel	400.00	0.12	1200.00	14.90	401.67	1102.88	281.17			531.17
Dct1-To-Store3	MidsizeTruck (Transport)	Diesel	400.00	0.12	1200.00	14.90	401.67	1102.88	281.17			531.17
Dct1-To-Store4	MidsizeTruck (Transport)	Diesel	400.00	0.12	1200.00	14.90	401.67	1102.88	281.17			531.17
Dct1-To-Store5	MidsizeTruck (Transport)	Diesel	400.00	0.12	1200.00	14.90	401.67	1102.88	281.17			531.17
Dct1-To-Store6	MidsizeTruck (Transport)	Diesel	400.00	0.12	1200.00	14.90	401.67	1102.88	281.17			531.17
Dct1-To-Store7	MidsizeTruck (Transport)	Diesel	400.00	0.12	1200.00	14.90	401.67	1102.88	281.17			531.17
Dct1-To-Store8	MidsizeTruck (Transport)	Diesel	400.00	0.12	1200.00	14.90	401.67	1102.88	281.17			531.17
Dct1-To-Store9	MidsizeTruck (Transport)	Diesel	400.00	0.12	1200.00	14.90	401.67	1102.88	281.17			531.17
Dct1-To-Store10	MidsizeTruck (Transport)	Diesel	400.00	0.12	1200.00	14.90	401.67	1102.88	281.17			531.17
Dct1	SatStorage-Large (Transport)	Electricity			136262.00	84.84	22967.62	14335.84	2296.78		778.52	3135.31
Store-1	SatStorage (Transport)	Electricity			300.00	4.71	1308.00	795.63	130.80		500.60	631.40
Store-2	SatStorage (Transport)	Electricity			300.00	4.71	1308.00	795.63	130.80		500.60	631.40
Store-3	SatStorage (Transport)	Electricity			300.00	4.71	1308.00	795.63	130.80		500.60	631.40
Store-4	SatStorage (Transport)	Electricity			300.00	4.71	1308.00	795.63	130.80		500.60	631.40
Store-5	SatStorage (Transport)	Electricity			300.00	4.71	1308.00	795.63	130.80		500.60	631.40
Store-6	SatStorage (Transport)	Electricity			300.00	4.71	1308.00	795.63	130.80		500.60	631.40
Store-7	SatStorage (Transport)	Electricity			300.00	4.71	1308.00	795.63	130.80		500.60	631.40
Store-8	SatStorage (Transport)	Electricity			300.00	4.71	1308.00	795.63	130.80		500.60	631.40
Store-9	SatStorage (Transport)	Electricity			300.00	4.71	1308.00	795.63	130.80		500.60	631.40
Store-10	SatStorage (Transport)	Electricity			300.00	4.71	1308.00	795.63	130.80		500.60	631.40
TOTAL						641.61		68087.41	14026.60	7092.60	6563.05	27684.25

NodeOrLink	Mode	EnergyOrFuelType	Distance-Km	DeliveryPeriod-Days	BatchSizeOrVolumeInventory	EnergyUsedPerDay-GJ	FuelUsedPerDay-L-Kg-Cum-Kwh-GJ	EmissionsGeneratedPerDay-Kg-CO2	EnergyOrFuelCostPerDay-Dollars	TransportationOverheadCostPerDay-Dollars	StorageOverheadCostPerDay-Dollars	TotalCostPerDay-Dollars
Supplier1-To-Dst	Ship-LargeTanker (Transport)	BunkerFuel	14000.00	40.00	20000.00	2.72	67.06	205.94	46.94	6.30		53.24
Supplier2-To-Dst	HeavydutyTruck (Transport)	Diesel	800.00	3.60	18000.00	2.77	74.67	205.02	52.27	66.67		118.93
Supplier3-To-Dst	HeavydutyTruck (Transport)	Diesel	1200.00	3.60	18000.00	4.16	112.00	307.03	76.40	100.00		176.40
Supplier4-To-Dst	HeavydutyTruck (Transport)	Diesel	1600.00	3.60	18000.00	5.54	149.33	410.03	104.53	133.33		237.87
Supplier5-To-Dst	HeavydutyTruck (Transport)	Diesel	2000.00	3.60	18000.00	6.93	186.67	512.54	130.67	166.67		297.33
Supplier6-To-Dst	HeavydutyTruck (Transport)	Diesel	2400.00	3.60	18000.00	8.31	224.00	615.05	156.80	200.00		356.80
Supplier7-To-Dst	HeavydutyTruck (Transport)	Diesel	2800.00	3.60	18000.00	9.70	261.33	717.56	182.03	233.33		415.33
Supplier8-To-Dst	HeavydutyTruck (Transport)	Diesel	3200.00	3.60	18000.00	11.09	298.67	820.07	209.07	266.67		475.73
Supplier9-To-Dst	HeavydutyTruck (Transport)	Diesel	3600.00	3.60	18000.00	12.47	336.00	922.58	235.20	300.00		535.20
Supplier10-To-Dst	Rail (Transport)	Diesel	2000.00	6.00	30000.00	4.05	109.25	299.98	76.48	90.00		166.48
Supplier11-To-Dst	HeavydutyTruck (Transport)	Diesel	3600.00	3.60	18000.00	12.47	336.00	922.58	235.20	300.00		535.20
Supplier12-To-Dst	HeavydutyTruck (Transport)	Diesel	3200.00	3.60	18000.00	11.09	298.67	820.07	209.07	266.67		475.73
Supplier13-To-Dst	HeavydutyTruck (Transport)	Diesel	2800.00	3.60	18000.00	9.70	261.33	717.56	182.03	233.33		415.33
Supplier14-To-Dst	HeavydutyTruck (Transport)	Diesel	2400.00	3.60	18000.00	8.31	224.00	615.05	156.80	200.00		356.80
Supplier15-To-Dst	HeavydutyTruck (Transport)	Diesel	2000.00	3.60	18000.00	6.93	186.67	512.54	130.67	166.67		297.33
Supplier16-To-Dst	HeavydutyTruck (Transport)	Diesel	1600.00	3.60	18000.00	5.54	149.33	410.03	104.53	133.33		237.87
Supplier17-To-Dst	HeavydutyTruck (Transport)	Diesel	1200.00	3.60	18000.00	4.16	112.00	307.03	76.40	100.00		176.40
Supplier18-To-Dst	HeavydutyTruck (Transport)	Diesel	800.00	3.60	18000.00	2.77	74.67	205.02	52.27	66.67		118.93
Supplier14-To-Dst	Ship-LargeTanker (Transport)	BunkerFuel	14000.00	40.00	20000.00	2.72	67.06	205.94	46.94	6.30		53.24
Dst1-To-Supplier1	HeavydutyTruck (Transport)	Diesel	400.00	0.36	3600.00	6.93	186.67	512.54	130.67	166.67		297.33
Dst1-To-Supplier2	HeavydutyTruck (Transport)	Diesel	400.00	0.36	3600.00	6.93	186.67	512.54	130.67	166.67		297.33
Dst1-To-Supplier3	HeavydutyTruck (Transport)	Diesel	400.00	0.36	3600.00	6.93	186.67	512.54	130.67	166.67		297.33
Dst1-To-Supplier4	HeavydutyTruck (Transport)	Diesel	400.00	0.36	3600.00	6.93	186.67	512.54	130.67	166.67		297.33
Dst1-To-Supplier5	HeavydutyTruck (Transport)	Diesel	400.00	0.36	3600.00	6.93	186.67	512.54	130.67	166.67		297.33
Dst1-To-Supplier6	HeavydutyTruck (Transport)	Diesel	400.00	0.36	3600.00	6.93	186.67	512.54	130.67	166.67		297.33
Dst1-To-Supplier7	HeavydutyTruck (Transport)	Diesel	400.00	0.36	3600.00	6.93	186.67	512.54	130.67	166.67		297.33
Dst1-To-Supplier8	HeavydutyTruck (Transport)	Diesel	400.00	0.36	3600.00	6.93	186.67	512.54	130.67	166.67		297.33
Dst1-To-Supplier9	HeavydutyTruck (Transport)	Diesel	400.00	0.36	3600.00	6.93	186.67	512.54	130.67	166.67		297.33
Dst1-To-Supplier10	HeavydutyTruck (Transport)	Diesel	400.00	0.36	3600.00	6.93	186.67	512.54	130.67	166.67		297.33
Dst1	SelfStorage-Large (Transport)	Electricity			177029.33	106.79	29662.55	18043.14	2966.26		854.06	3820.31
Store-1	SelfStorage (Transport)	Electricity			1500.00	106.79	29662.55	18043.14	2966.26			3820.31
Store-2	SelfStorage (Transport)	Electricity			1500.00	6.26	1740.00	1058.41	174.00			677.00
Store-3	SelfStorage (Transport)	Electricity			1500.00	6.26	1740.00	1058.41	174.00			677.00
Store-4	SelfStorage (Transport)	Electricity			1500.00	6.26	1740.00	1058.41	174.00			677.00
Store-5	SelfStorage (Transport)	Electricity			1500.00	6.26	1740.00	1058.41	174.00			677.00
Store-6	SelfStorage (Transport)	Electricity			1500.00	6.26	1740.00	1058.41	174.00			677.00
Store-7	SelfStorage (Transport)	Electricity			1500.00	6.26	1740.00	1058.41	174.00			677.00
Store-8	SelfStorage (Transport)	Electricity			1500.00	6.26	1740.00	1058.41	174.00			677.00
Store-9	SelfStorage (Transport)	Electricity			1500.00	6.26	1740.00	1058.41	174.00			677.00
Store-10	SelfStorage (Transport)	Electricity			1500.00	6.26	1740.00	1058.41	174.00			677.00
TOTAL						480.89		61836.39	11525.74	4792.60	6738.12	23554.46

NodeOrLink	Mode	EnergyOrFuelType	Distance-Km	DeliveryPeriod-Days	BatchSizeOrAvailment	EnergyUsedPerDay-GJ	FuelUsedPerDay-L-Kg-Cub-Kwh-GJ	EmissionsGeneratedPerDay-Kg-CO2	EnergyOrFuelCostPerDay-Dollars	TransportationOverheadCostPerDay-Dollars	StorageOverheadCostPerDay-Dollars	TotalCostPerDay-Dollars
Supplier1-To-Dct1	Ship-LargeTanker (Transport)	BunkerFuel	14000.00	40.00	200000.00	2.72	67.06	209.94	46.94	6.30		53.24
Supplier2-To-Dct1	MidsizeTruck (Transport)	Diesel	800.00	1.20	8000.00	5.96	180.87	441.15	112.47	100.00		212.47
Supplier3-To-Dct1	MidsizeTruck (Transport)	Diesel	1200.00	1.20	8000.00	8.94	241.00	661.71	168.70	150.00		318.70
Supplier4-To-Dct1	MidsizeTruck (Transport)	Diesel	1600.00	1.20	8000.00	11.92	321.33	882.31	224.93	200.00		424.93
Supplier5-To-Dct1	MidsizeTruck (Transport)	Diesel	2000.00	1.20	8000.00	14.90	401.67	1102.88	281.17	250.00		531.17
Supplier6-To-Dct1	MidsizeTruck (Transport)	Diesel	2400.00	1.20	8000.00	17.88	482.00	1323.46	337.40	300.00		637.40
Supplier7-To-Dct1	MidsizeTruck (Transport)	Diesel	2800.00	1.20	8000.00	20.86	562.33	1544.04	393.63	350.00		743.63
Supplier8-To-Dct1	MidsizeTruck (Transport)	Diesel	3200.00	1.20	8000.00	23.84	642.67	1764.61	449.87	400.00		849.87
Supplier9-To-Dct1	MidsizeTruck (Transport)	Diesel	3600.00	1.20	8000.00	26.82	723.00	1985.19	506.10	450.00		956.10
Supplier10-To-Dct1	Rail (Transport)	Diesel	2000.00	6.00	30000.00	4.05	109.25	299.98	76.48	90.00		166.48
Supplier5-To-Dct2	MidsizeTruck (Transport)	Diesel	2800.00	1.20	8000.00	20.86	562.33	1544.04	393.63	350.00		743.63
Supplier7-To-Dct2	MidsizeTruck (Transport)	Diesel	3200.00	1.20	8000.00	23.84	642.67	1764.61	449.87	400.00		849.87
Supplier9-To-Dct2	MidsizeTruck (Transport)	Diesel	3600.00	1.20	8000.00	26.82	723.00	1985.19	506.10	450.00		956.10
Supplier11-To-Dct2	MidsizeTruck (Transport)	Diesel	4000.00	1.20	8000.00	29.80	803.33	2205.77	562.31	500.00		1062.31
Supplier13-To-Dct2	MidsizeTruck (Transport)	Diesel	4400.00	1.20	8000.00	32.78	883.67	2426.35	618.54	550.00		1168.54
Supplier15-To-Dct2	MidsizeTruck (Transport)	Diesel	4800.00	1.20	8000.00	35.76	964.00	2646.92	674.77	600.00		1274.77
Supplier17-To-Dct2	MidsizeTruck (Transport)	Diesel	5200.00	1.20	8000.00	38.74	1044.33	2867.50	731.00	650.00		1381.00
Supplier19-To-Dct2	MidsizeTruck (Transport)	Diesel	5600.00	1.20	8000.00	41.72	1124.67	3088.08	787.23	700.00		1487.23
Supplier21-To-Dct2	MidsizeTruck (Transport)	Diesel	6000.00	1.20	8000.00	44.70	1205.00	3308.66	843.46	750.00		1593.46
Supplier23-To-Dct2	MidsizeTruck (Transport)	Diesel	6400.00	1.20	8000.00	47.68	1285.33	3529.24	899.69	800.00		1699.69
Supplier25-To-Dct2	MidsizeTruck (Transport)	Diesel	6800.00	1.20	8000.00	50.66	1365.67	3749.82	955.92	850.00		1805.92
Supplier27-To-Dct2	MidsizeTruck (Transport)	Diesel	7200.00	1.20	8000.00	53.64	1446.00	3970.40	1012.15	900.00		1912.15
Supplier29-To-Dct2	MidsizeTruck (Transport)	Diesel	7600.00	1.20	8000.00	56.62	1526.33	4190.98	1068.38	950.00		2018.38
Supplier31-To-Dct2	MidsizeTruck (Transport)	Diesel	8000.00	1.20	8000.00	59.60	1606.67	4411.56	1124.61	1000.00		2124.61
Supplier33-To-Dct2	Ship-LargeTanker (Transport)	BunkerFuel	14000.00	40.00	200000.00	2.72	67.06	209.94	46.94	6.30		53.24
Dct1-To-Store1	MidsizeTruck (Transport)	Diesel	400.00	0.12	1200.00	14.90	401.67	1102.88	281.17	250.00		531.17
Dct1-To-Store2	MidsizeTruck (Transport)	Diesel	400.00	0.12	1200.00	14.90	401.67	1102.88	281.17	250.00		531.17
Dct1-To-Store3	MidsizeTruck (Transport)	Diesel	400.00	0.12	1200.00	14.90	401.67	1102.88	281.17	250.00		531.17
Dct1-To-Store4	MidsizeTruck (Transport)	Diesel	400.00	0.12	1200.00	14.90	401.67	1102.88	281.17	250.00		531.17
Dct1-To-Store5	MidsizeTruck (Transport)	Diesel	400.00	0.12	1200.00	14.90	401.67	1102.88	281.17	250.00		531.17
Dct1-To-Store6	MidsizeTruck (Transport)	Diesel	400.00	0.12	1200.00	14.90	401.67	1102.88	281.17	250.00		531.17
Dct1-To-Store7	MidsizeTruck (Transport)	Diesel	400.00	0.12	1200.00	14.90	401.67	1102.88	281.17	250.00		531.17
Dct1-To-Store8	MidsizeTruck (Transport)	Diesel	400.00	0.12	1200.00	14.90	401.67	1102.88	281.17	250.00		531.17
Dct1-To-Store9	MidsizeTruck (Transport)	Diesel	400.00	0.12	1200.00	14.90	401.67	1102.88	281.17	250.00		531.17
Dct1-To-Store10	MidsizeTruck (Transport)	Diesel	400.00	0.12	1200.00	14.90	401.67	1102.88	281.17	250.00		531.17
Dct1	CoalStorageLarger (Transport)	Electricity	130000.00	400.70	113695.50			11369.55	6950.42	11268.95	778.52	12048.07
Dct1	CoalStorageLarger (Transport)	Electricity	130000.00	400.70	113695.50			11369.55	6950.42	11268.95	778.52	12048.07
Store-1	CoalStorage (Transport)	Electricity	300.00	6.78	1884.00			1146.00	188.40		500.60	699.00
Store-2	CoalStorage (Transport)	Electricity	300.00	6.78	1884.00			1146.00	188.40		500.60	699.00
Store-3	CoalStorage (Transport)	Electricity	300.00	6.78	1884.00			1146.00	188.40		500.60	699.00
Store-4	CoalStorage (Transport)	Electricity	300.00	6.78	1884.00			1146.00	188.40		500.60	699.00
Store-5	CoalStorage (Transport)	Electricity	300.00	6.78	1884.00			1146.00	188.40		500.60	699.00
Store-6	CoalStorage (Transport)	Electricity	300.00	6.78	1884.00			1146.00	188.40		500.60	699.00
Store-7	CoalStorage (Transport)	Electricity	300.00	6.78	1884.00			1146.00	188.40		500.60	699.00
Store-8	CoalStorage (Transport)	Electricity	300.00	6.78	1884.00			1146.00	188.40		500.60	699.00
Store-9	CoalStorage (Transport)	Electricity	300.00	6.78	1884.00			1146.00	188.40		500.60	699.00
Store-10	CoalStorage (Transport)	Electricity	300.00	6.78	1884.00			1146.00	188.40		500.60	699.00
TOTAL						1304.08		180020.28	32430.13	7092.60	6563.05	46085.78

NodeOrLink	Mode	EnergyOrFuelType	Distance-Km	DeliveryPeriod-Days	BatchSizeOrAveInventory	EnergyUsedPerDay-GJ	FuelUsedPerDay-L-Kg-CuM-Kwh-GJ	EmissionsGeneratedPerDay-Kg-CO2	EnergyOrFuelCostPerDay-Dollars	TransportationOverheadCostPerDay-Dollars	StorageOverheadCostPerDay-Dollars	TotalCostPerDay-Dollars
Supplier1-To-Dct1	Ship-LargeTanker (Transport)	BunkerFuel	14000.00	40.00	200000.00	2.72	67.06	209.94	46.94	6.30		53.24
Supplier2-To-Dct1	HeavydutyTruck (Transport)	Diesel	800.00	3.60	18000.00	2.77	74.67	206.02	52.27	68.67		118.93
Supplier3-To-Dct1	HeavydutyTruck (Transport)	Diesel	1200.00	3.60	18000.00	4.34	112.09	307.53	78.40	100.00		178.40
Supplier4-To-Dct1	HeavydutyTruck (Transport)	Diesel	1600.00	3.60	18000.00	5.54	146.33	410.03	104.53	133.33		237.87
Supplier5-To-Dct1	HeavydutyTruck (Transport)	Diesel	2000.00	3.60	18000.00	6.93	186.67	512.54	130.67	166.67		297.33
Supplier6-To-Dct1	HeavydutyTruck (Transport)	Diesel	2400.00	3.60	18000.00	8.31	224.08	615.05	156.80	200.00		366.80
Supplier7-To-Dct1	HeavydutyTruck (Transport)	Diesel	2800.00	3.60	18000.00	9.70	261.33	717.86	182.63	233.33		416.27
Supplier8-To-Dct1	HeavydutyTruck (Transport)	Diesel	3200.00	3.60	18000.00	11.08	298.67	820.07	209.07	266.67		475.73
Supplier9-To-Dct1	HeavydutyTruck (Transport)	Diesel	3600.00	3.60	18000.00	12.47	336.00	922.98	235.00	300.00		535.00
Supplier10-To-Dct1	Rail (Transport)	Diesel	2000.00	6.00	30000.00	4.05	109.25	299.98	76.48	90.00		166.48
Supplier5-To-Dct2	HeavydutyTruck (Transport)	Diesel	3600.00	3.60	18000.00	12.47	336.00	922.98	235.00	300.00		535.00
Supplier7-To-Dct2	HeavydutyTruck (Transport)	Diesel	3200.00	3.60	18000.00	11.08	298.67	820.07	209.07	266.67		475.73
Supplier9-To-Dct2	HeavydutyTruck (Transport)	Diesel	2800.00	3.60	18000.00	9.70	261.33	717.86	182.63	233.33		416.27
Supplier11-To-Dct2	HeavydutyTruck (Transport)	Diesel	2400.00	3.60	18000.00	8.31	224.08	615.05	156.80	200.00		366.80
Supplier12-To-Dct2	HeavydutyTruck (Transport)	Diesel	2000.00	3.60	18000.00	6.93	186.67	512.54	130.67	166.67		297.33
Supplier13-To-Dct2	HeavydutyTruck (Transport)	Diesel	1600.00	3.60	18000.00	5.54	146.33	410.03	104.53	133.33		237.87
Supplier14-To-Dct2	HeavydutyTruck (Transport)	Diesel	1200.00	3.60	18000.00	4.35	112.09	307.53	78.40	100.00		178.40
Supplier15-To-Dct2	HeavydutyTruck (Transport)	Diesel	800.00	3.60	18000.00	2.77	74.67	206.02	52.27	68.67		118.93
Supplier14-To-Dct2	Ship-LargeTanker (Transport)	BunkerFuel	14000.00	40.00	200000.00	2.72	67.06	209.94	46.94	6.30		53.24
Dct1-To-Save1	HeavydutyTruck (Transport)	Diesel	400.00	0.36	3600.00	6.93	186.67	512.54	130.67	166.67		297.33
Dct1-To-Save2	HeavydutyTruck (Transport)	Diesel	400.00	0.36	3600.00	6.93	186.67	512.54	130.67	166.67		297.33
Dct1-To-Save3	HeavydutyTruck (Transport)	Diesel	400.00	0.36	3600.00	6.93	186.67	512.54	130.67	166.67		297.33
Dct1-To-Save4	HeavydutyTruck (Transport)	Diesel	400.00	0.36	3600.00	6.93	186.67	512.54	130.67	166.67		297.33
Dct1-To-Save5	HeavydutyTruck (Transport)	Diesel	400.00	0.36	3600.00	6.93	186.67	512.54	130.67	166.67		297.33
Dct1-To-Save6	HeavydutyTruck (Transport)	Diesel	400.00	0.36	3600.00	6.93	186.67	512.54	130.67	166.67		297.33
Dct1-To-Save7	HeavydutyTruck (Transport)	Diesel	400.00	0.36	3600.00	6.93	186.67	512.54	130.67	166.67		297.33
Dct1-To-Save8	HeavydutyTruck (Transport)	Diesel	400.00	0.36	3600.00	6.93	186.67	512.54	130.67	166.67		297.33
Dct1-To-Save9	HeavydutyTruck (Transport)	Diesel	400.00	0.36	3600.00	6.93	186.67	512.54	130.67	166.67		297.33
Dct1-To-Save10	HeavydutyTruck (Transport)	Diesel	400.00	0.36	3600.00	6.93	186.67	512.54	130.67	166.67		297.33
Dct1	CoalStorageLarger (Transport)	Electricity			1771029.33	514.66	142961.26	89960.47	14296.13		854.06	15100.18
Dct1	CoalStorageLarger (Transport)	Electricity			1771029.33	514.66	142961.26	89960.47	14296.13			15100.18
Store-1	CoalStorage (Transport)	Electricity			1500.00	16.63	4620.00	2810.25	462.00		865.00	965.00
Store-2	CoalStorage (Transport)	Electricity			1500.00	16.63	4620.00	2810.25	462.00		865.00	965.00
Store-3	CoalStorage (Transport)	Electricity			1500.00	16.63	4620.00	2810.25	462.00		865.00	965.00
Store-4	CoalStorage (Transport)	Electricity			1500.00	16.63	4620.00	2810.25	462.00		865.00	965.00
Store-5	CoalStorage (Transport)	Electricity			1500.00	16.63	4620.00	2810.25	462.00		865.00	965.00
Store-6	CoalStorage (Transport)	Electricity			1500.00	16.63	4620.00	2810.25	462.00		865.00	965.00
Store-7	CoalStorage (Transport)	Electricity			1500.00	16.63	4620.00	2810.25	462.00		865.00	965.00
Store-8	CoalStorage (Transport)	Electricity			1500.00	16.63	4620.00	2810.25	462.00		865.00	965.00
Store-9	CoalStorage (Transport)	Electricity			1500.00	16.63	4620.00	2810.25	462.00		865.00	965.00
Store-10	CoalStorage (Transport)	Electricity			1500.00	16.63	4620.00	2810.25	462.00		865.00	965.00
TOTAL						1400.32		217189.52	37065.49	4792.60	6738.12	48596.20

Node/Link	Mode	EnergyOrFuelType	Distance-Km	DeliveryPeriod-Days	BatchSizeOrInventory	EnergyUsedPerDay-GJ	FuelUsedPerDay-L-Kg-CuM-Kwh-GJ	EmissionsGeneratedPerDay-Kg-CO2	EnergyOrFuelCostPerDay-Dollars	TransportationOverheadCostPerDay-Dollars	StorageOverheadCostPerDay-Dollars	TotalCostPerDay-Dollars
Supplier1-To-Dc1	Ship-LargeTanker (Transport)	BunkerFuel	14000.00	40.00	200000.00	2.72	67.06	209.94	46.94			53.24
Supplier1-To-Dc1	MediumTruck (Transport)	Diesel	400.00	1.20	6000.00	2.98	86.33	220.98	56.23			106.23
Supplier3-To-Dc1	MediumTruck (Transport)	Diesel	600.00	1.20	6000.00	4.47	120.50	330.07	84.36			159.35
Supplier4-To-Dc1	MediumTruck (Transport)	Diesel	600.00	1.20	6000.00	5.06	168.67	441.15	112.47			212.47
Supplier5-To-Dc1	MediumTruck (Transport)	Diesel	1000.00	1.20	6000.00	7.45	200.83	551.44	140.58			265.58
Supplier5-To-Dc1	MediumTruck (Transport)	Diesel	1000.00	1.20	6000.00	8.94	241.00	661.73	168.70			318.70
Supplier7-To-Dc1	MediumTruck (Transport)	Diesel	1400.00	1.20	6000.00	10.43	281.17	772.02	196.82			371.82
Supplier8-To-Dc1	MediumTruck (Transport)	Diesel	1800.00	1.20	6000.00	11.92	321.33	882.31	224.93			424.93
Supplier9-To-Dc1	MediumTruck (Transport)	Diesel	1800.00	1.20	6000.00	13.41	361.50	992.60	253.05			478.05
Supplier10-To-Dc1	Rail (Transport)	Diesel	3000.00	6.00	30000.00	2.03	54.63	149.99	38.94	45.00		83.94
Supplier5-To-Dc2	Rail (Transport)	Diesel	1000.00	6.00	30000.00	2.03	54.63	149.99	38.24	45.00		83.24
Supplier5-To-Dc2	MediumTruck (Transport)	Diesel	1800.00	1.20	6000.00	13.41	361.50	992.60	253.05			478.05
Supplier7-To-Dc2	MediumTruck (Transport)	Diesel	1600.00	1.20	6000.00	11.92	321.33	882.31	224.93			424.93
Supplier8-To-Dc2	MediumTruck (Transport)	Diesel	1400.00	1.20	6000.00	10.43	281.17	772.02	196.82			371.82
Supplier9-To-Dc2	MediumTruck (Transport)	Diesel	1200.00	1.20	6000.00	8.94	241.00	661.73	168.70			318.70
Supplier10-To-Dc2	MediumTruck (Transport)	Diesel	1000.00	1.20	6000.00	7.45	200.83	551.44	140.58			265.58
Supplier11-To-Dc2	MediumTruck (Transport)	Diesel	800.00	1.20	6000.00	5.95	160.67	441.15	112.47			212.47
Supplier12-To-Dc2	MediumTruck (Transport)	Diesel	600.00	1.20	6000.00	4.47	120.50	330.07	84.36			159.35
Supplier13-To-Dc2	MediumTruck (Transport)	Diesel	400.00	1.20	6000.00	2.98	86.33	220.98	56.23			106.23
Supplier14-To-Dc2	Ship-LargeTanker (Transport)	BunkerFuel	14000.00	40.00	200000.00	2.72	67.06	209.94	46.94			53.24
Dc1-To-Store1	MediumTruck (Transport)	Diesel	200.00	0.12	1200.00	7.45	200.83	551.44	140.58			265.58
Dc1-To-Store2	MediumTruck (Transport)	Diesel	200.00	0.12	1200.00	7.45	200.83	551.44	140.58			265.58
Dc1-To-Store3	MediumTruck (Transport)	Diesel	200.00	0.12	1200.00	7.45	200.83	551.44	140.58			265.58
Dc1-To-Store4	MediumTruck (Transport)	Diesel	200.00	0.12	1200.00	7.45	200.83	551.44	140.58			265.58
Dc1-To-Store5	MediumTruck (Transport)	Diesel	200.00	0.12	1200.00	7.45	200.83	551.44	140.58			265.58
Dc1-To-Store6	MediumTruck (Transport)	Diesel	200.00	0.12	1200.00	7.45	200.83	551.44	140.58			265.58
Dc1-To-Store7	MediumTruck (Transport)	Diesel	200.00	0.12	1200.00	7.45	200.83	551.44	140.58			265.58
Dc1-To-Store8	MediumTruck (Transport)	Diesel	200.00	0.12	1200.00	7.45	200.83	551.44	140.58			265.58
Dc1-To-Store9	MediumTruck (Transport)	Diesel	200.00	0.12	1200.00	7.45	200.83	551.44	140.58			265.58
Dc1-To-Store10	MediumTruck (Transport)	Diesel	200.00	0.12	1200.00	7.45	200.83	551.44	140.58			265.58
Dc1	CoolStorageLarger (Transport)	Electricity			136262.00	406.71	112974.00	68719.82	11297.40	778.52		12075.92
Dc2	CoolStorageLarger (Transport)	Electricity			136262.00	406.71	112974.00	68719.82	11297.40	778.52		12075.92
Store-1	CoolStorage (Transport)	Electricity			300.00	6.78	1884.00	1146.00	188.40		500.60	689.00
Store-2	CoolStorage (Transport)	Electricity			300.00	6.78	1884.00	1146.00	188.40		500.60	689.00
Store-3	CoolStorage (Transport)	Electricity			300.00	6.78	1884.00	1146.00	188.40		500.60	689.00
Store-4	CoolStorage (Transport)	Electricity			300.00	6.78	1884.00	1146.00	188.40		500.60	689.00
Store-5	CoolStorage (Transport)	Electricity			300.00	6.78	1884.00	1146.00	188.40		500.60	689.00
Store-6	CoolStorage (Transport)	Electricity			300.00	6.78	1884.00	1146.00	188.40		500.60	689.00
Store-7	CoolStorage (Transport)	Electricity			300.00	6.78	1884.00	1146.00	188.40		500.60	689.00
Store-8	CoolStorage (Transport)	Electricity			300.00	6.78	1884.00	1146.00	188.40		500.60	689.00
Store-9	CoolStorage (Transport)	Electricity			300.00	6.78	1884.00	1146.00	188.40		500.60	689.00
Store-10	CoolStorage (Transport)	Electricity			300.00	6.78	1884.00	1146.00	188.40		500.60	689.00
TOTAL						1096.37		164839.31	28529.26	3952.60	6563.05	38644.91

NodeOrLink	Mode	EnergyOrFuelType	Distance-Km	DeliveryPeriod-Days	BatchSizeOrAveInventory	EnergyUsedPerDay-GJ	FuelUsedPerDay-L-Kg-CuM-Kwh-GJ	EmissionsGeneratedPerDay-Kg-CO2	EnergyOrFuelCostPerDay-Dollars	TransportationOverheadCostPerDay-Dollars	StorageOverheadCostPerDay-Dollars	TotalCostPerDay-Dollars
Supplier1-To-Dct1	Ship-LargeTanker (Transport)	BunkerFuel	14000.00	40.00	200000.00	2.72	67.06	209.94	46.94	6.30		53.24
Supplier2-To-Dct1	HeavydutyTruck (Transport)	Diesel	400.00	3.60	18000.00	1.39	27.33	102.51	26.13	31.33		58.47
Supplier3-To-Dct1	HeavydutyTruck (Transport)	Diesel	600.00	3.60	18000.00	2.09	56.00	153.76	39.20	50.00		89.20
Supplier4-To-Dct1	HeavydutyTruck (Transport)	Diesel	800.00	3.60	18000.00	2.77	74.67	206.02	52.27	66.67		118.93
Supplier5-To-Dct1	HeavydutyTruck (Transport)	Diesel	1000.00	3.60	18000.00	3.46	93.33	256.27	65.33	83.33		148.67
Supplier6-To-Dct1	HeavydutyTruck (Transport)	Diesel	1200.00	3.60	18000.00	4.16	112.00	307.53	78.40	100.00		178.40
Supplier7-To-Dct1	HeavydutyTruck (Transport)	Diesel	1400.00	3.60	18000.00	4.85	130.67	358.78	91.47	116.67		208.13
Supplier8-To-Dct1	HeavydutyTruck (Transport)	Diesel	1600.00	3.60	18000.00	5.54	149.33	410.03	104.03	133.33		237.37
Supplier9-To-Dct1	HeavydutyTruck (Transport)	Diesel	1800.00	3.60	18000.00	6.23	168.00	461.29	117.60	150.00		267.80
Supplier10-To-Dct1	Rail (Transport)	Diesel	1000.00	6.00	30000.00	2.03	54.63	149.99	38.24	46.00		83.24
Supplier5-To-Dct2	HeavydutyTruck (Transport)	Diesel	1800.00	3.60	18000.00	6.23	168.00	461.29	117.60	150.00		267.80
Supplier7-To-Dct2	HeavydutyTruck (Transport)	Diesel	1600.00	3.60	18000.00	5.54	149.33	410.03	104.03	133.33		237.37
Supplier9-To-Dct2	HeavydutyTruck (Transport)	Diesel	1400.00	3.60	18000.00	4.85	130.67	358.78	91.47	116.67		208.13
Supplier11-To-Dct2	HeavydutyTruck (Transport)	Diesel	1200.00	3.60	18000.00	4.16	112.00	307.53	78.40	100.00		178.40
Supplier13-To-Dct2	HeavydutyTruck (Transport)	Diesel	1000.00	3.60	18000.00	3.46	93.33	256.27	65.33	83.33		148.67
Supplier15-To-Dct2	HeavydutyTruck (Transport)	Diesel	800.00	3.60	18000.00	2.77	74.67	206.02	52.27	66.67		118.93
Supplier17-To-Dct2	HeavydutyTruck (Transport)	Diesel	600.00	3.60	18000.00	2.09	56.00	153.76	39.20	50.00		89.20
Supplier19-To-Dct2	HeavydutyTruck (Transport)	Diesel	400.00	3.60	18000.00	1.39	27.33	102.51	26.13	33.33		59.47
Supplier14-To-Dct3	Ship-LargeTanker (Transport)	BunkerFuel	14000.00	40.00	200000.00	2.72	67.06	209.94	46.94	6.30		53.24
Dct1-To-Store1	HeavydutyTruck (Transport)	Diesel	200.00	0.36	3600.00	0.46	93.33	256.27	65.33	83.33		148.67
Dct1-To-Store2	HeavydutyTruck (Transport)	Diesel	200.00	0.36	3600.00	0.46	93.33	256.27	65.33	83.33		148.67
Dct1-To-Store3	HeavydutyTruck (Transport)	Diesel	200.00	0.36	3600.00	0.46	93.33	256.27	65.33	83.33		148.67
Dct1-To-Store4	HeavydutyTruck (Transport)	Diesel	200.00	0.36	3600.00	0.46	93.33	256.27	65.33	83.33		148.67
Dct1-To-Store5	HeavydutyTruck (Transport)	Diesel	200.00	0.36	3600.00	0.46	93.33	256.27	65.33	83.33		148.67
Dct1-To-Store6	HeavydutyTruck (Transport)	Diesel	200.00	0.36	3600.00	0.46	93.33	256.27	65.33	83.33		148.67
Dct1-To-Store7	HeavydutyTruck (Transport)	Diesel	200.00	0.36	3600.00	0.46	93.33	256.27	65.33	83.33		148.67
Dct1-To-Store8	HeavydutyTruck (Transport)	Diesel	200.00	0.36	3600.00	0.46	93.33	256.27	65.33	83.33		148.67
Dct1-To-Store9	HeavydutyTruck (Transport)	Diesel	200.00	0.36	3600.00	0.46	93.33	256.27	65.33	83.33		148.67
Dct1-To-Store10	HeavydutyTruck (Transport)	Diesel	200.00	0.36	3600.00	0.46	93.33	256.27	65.33	83.33		148.67
Dct1	CoalStorageLarger (Transport)	Electricity			1771029.33	514.66	140961.26	89960.47	14096.13		854.06	15150.18
Dct1	CoalStorageLarger (Transport)	Electricity			1771029.33	514.66	140961.26	89960.47	14096.13		854.06	15150.18
Store1	CoalStorage (Transport)	Electricity			1500.00	16.63	4620.00	2810.25	462.00		503.00	965.00
Store2	CoalStorage (Transport)	Electricity			1500.00	16.63	4620.00	2810.25	462.00		503.00	965.00
Store3	CoalStorage (Transport)	Electricity			1500.00	16.63	4620.00	2810.25	462.00		503.00	965.00
Store4	CoalStorage (Transport)	Electricity			1500.00	16.63	4620.00	2810.25	462.00		503.00	965.00
Store5	CoalStorage (Transport)	Electricity			1500.00	16.63	4620.00	2810.25	462.00		503.00	965.00
Store6	CoalStorage (Transport)	Electricity			1500.00	16.63	4620.00	2810.25	462.00		503.00	965.00
Store7	CoalStorage (Transport)	Electricity			1500.00	16.63	4620.00	2810.25	462.00		503.00	965.00
Store8	CoalStorage (Transport)	Electricity			1500.00	16.63	4620.00	2810.25	462.00		503.00	965.00
Store9	CoalStorage (Transport)	Electricity			1500.00	16.63	4620.00	2810.25	462.00		503.00	965.00
Store10	CoalStorage (Transport)	Electricity			1500.00	16.63	4620.00	2810.25	462.00		503.00	965.00
TOTAL						1300.70		209856.44	35385.81	2402.60	6738.12	44326.53