# Innovation and Supply Chain Management: A Catalyst for Entrepreneurial Development

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**4th European Conference on ICT for Transport Logistics**
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# Agenda

- Innovation and Entrepreneurship within the New Globalized Environment
- Thessaloniki Innovation Zone
- Challenges for Global Supply Chain Management
- Need for a "Total Landed Cost" Paradigm
  - Offshoring/Nearshoring
  - Green Supply Chains
  - Cross-Border Trade & Logistics
- Regional Cargo Hub Development for Greece
- Wrap-up/Conclusions

# What Innovation is not…

- It is not invention!
- Although new products continue to be important, innovation today focuses mainly on services and processes
- Many innovations are neither new nor involve new technology (self-service by Mc-Donald's).

# Real Innovation is Not Necessarily Based on New Technologies…

- Starbucks' strategy and the Supply Chain Management Strategy of Dell Computers
- Instead of talking about technology we should rather be talking about "value" creation for customers.

# Innovation: Definitions

- «New products, business processes and organic changes that create wealth or social welfare»

  *OECD*

- «Fresh thinking that creates value»

  *Richard Lyons, Goldman Sachs.*

# Entrepreneurship…

- «The offering of an innovative solution to a usually non-recognized problem»

*The Economist*

- «The entrepreneur disrupts, reorganizes,»... « Innovation is a specific tool of entrprepenurship»

*Peter Drucker.*

# Traditional Models Are Not Efficient

- «Higher R&D spending does not ensure better performance in terms of growth, profitability or shareholder returns»

*Source: Booz Allen Hamilton (global study across industries)*

# The Flattened World

The ***simultaneous*** impact of

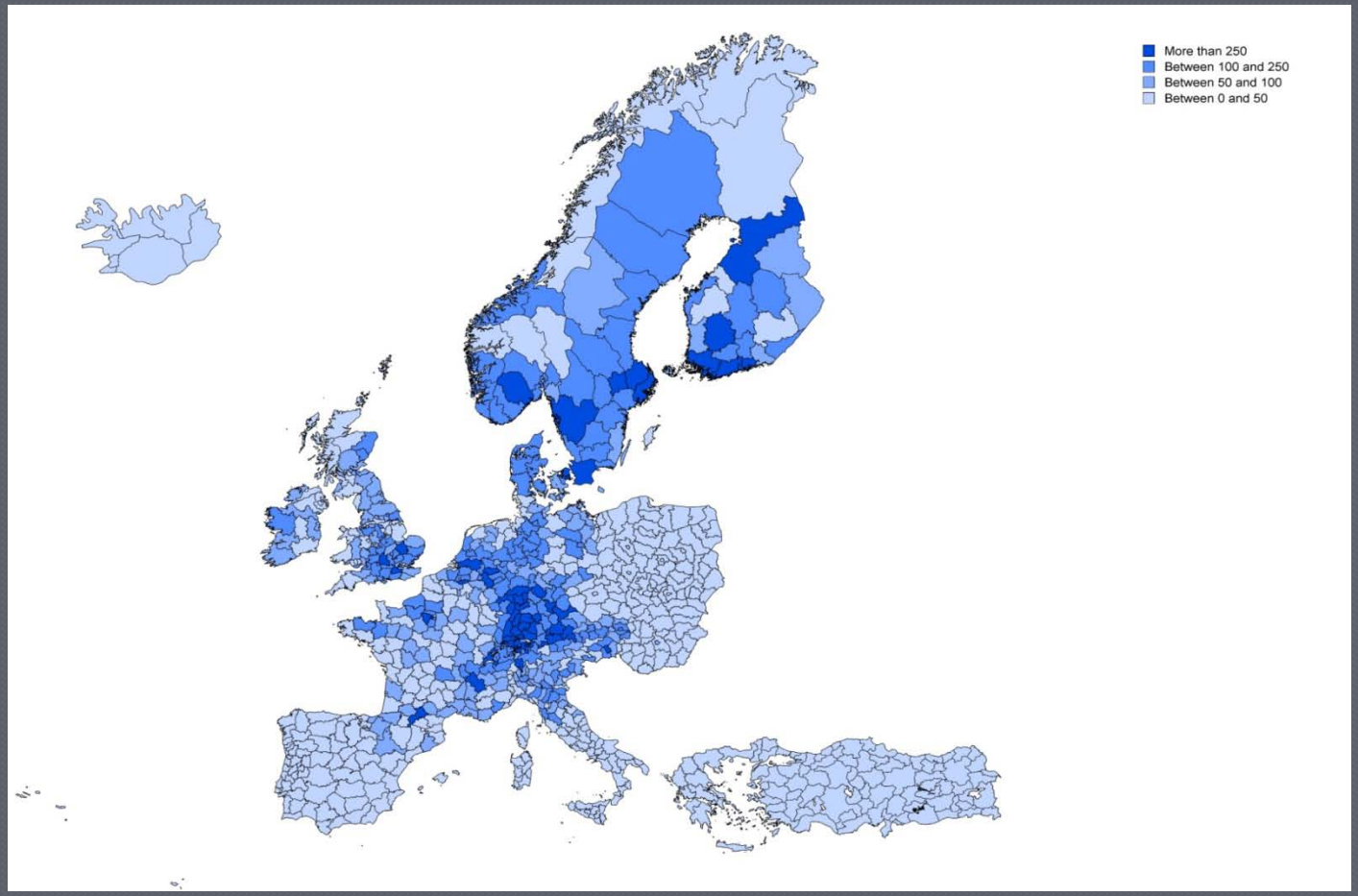
- *Information technology*
- *Worldwide financial flows*
- *Logistics methodologies*

***compounded*** by

- *Deregulation & Privatization*
- *Worldwide market economy*
- *Reduction in trade barriers*

is ***decoupling***
**procurement, production, distribution & consumption**
of ***offers*** in space & time.

# Innovation in a Non Flat World…

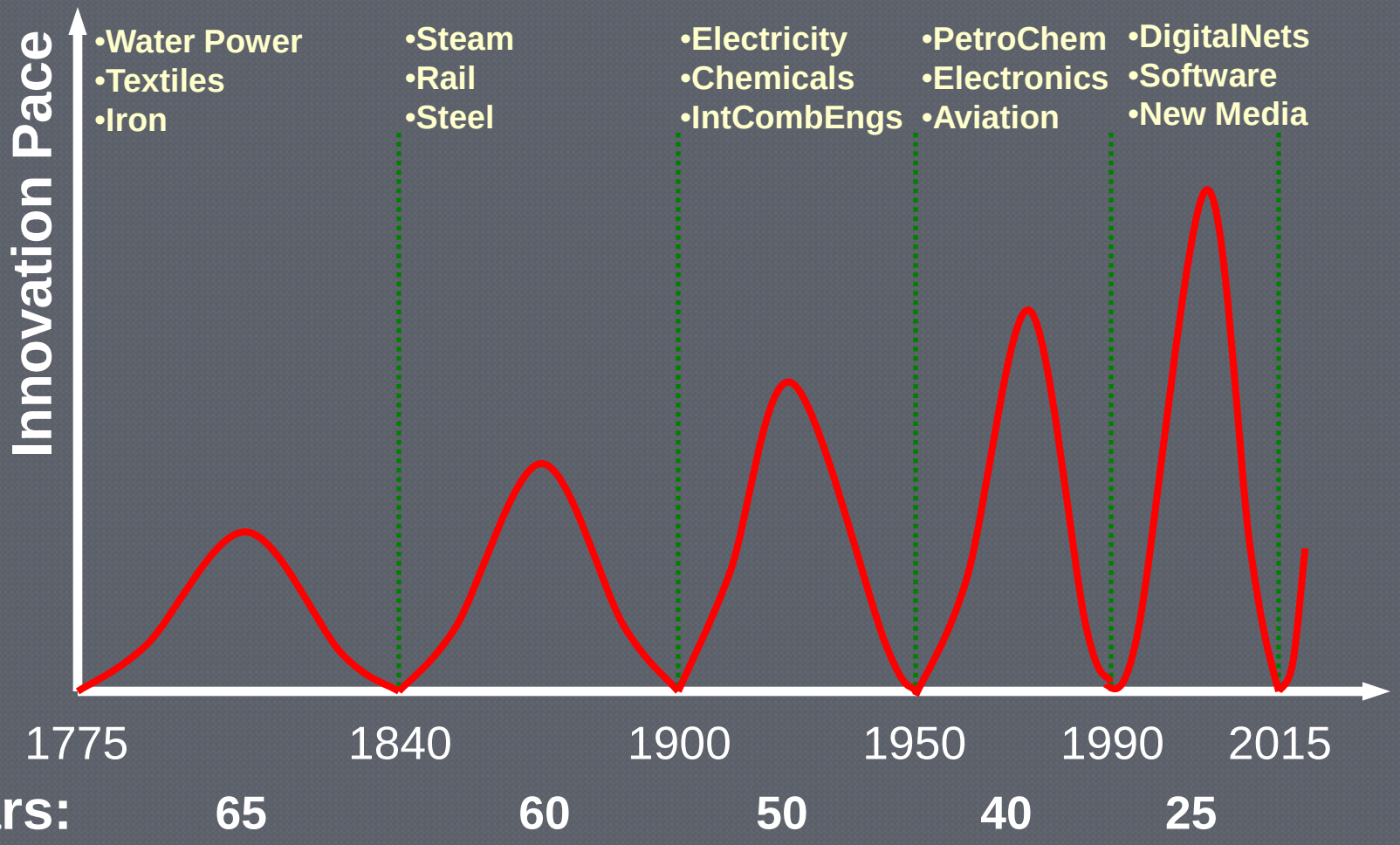



**Patents per million inhabitants, Europe,**

**2005-07**

*Source: OECD (2010), Measuring Innovation: A New Perspective, OECD, Paris.*

# Schumpeter's Waves



# Disruptive Innovation

- Firms invest heavily in attempting to deliver more features and better performance to their elite, more profitable, high-end customers
- The resulting products may end up beyond the reach of the majority of the customers
- That allows upstarts to enter the market and offer adequate (but inferior) products and services at much cheaper prices driving the incumbents into smaller niches and eventually out of business.

# Disruptive Innovation

- It is not "radical" or "breakthrough" innovation
  - For example, PCs disrupted IBM's mainframes and DEC's mini-computers

    Clayton Christensen, Harvard, "The Innovator's Dilemma"
  - Now Chinese and Indian firms disrupt established companies worldwide

# SCM Innovations

- A plethora of Wal-Mart's logistics innovations (cross-docking, EDI, EDLP, VMIS, CFPR) led to lower inventory levels and lower operational costs > lower selling prices .
- Operational innovations:
  - Dell Business Model
  - Toyota Production System.
- These **operational innovations** 'displaced' some of the most powerful businesses globally like Sears, General Motors and IBM.
- **This is the relationship between supply chain management, logistics, and innovation!**

# Wikinomics and Web 2.0

- YouTube serves up 2 billion videos a day.
- Twitterers tweet 750 times a second.
- Internet traffic is growing by 40% a year.
- The internet has morphed into a social medium
- People post 2.5 billion photos on Facebook every month.
- More than half of American teens say they are "content creators".

*The Economist (Sept. 2010)*

# Wikinomics and Web 2.0

- Collaboration is getting rapidly cheaper and easier.
- The web gives amateurs access to world-class communications tools and worldwide markets.
- It makes it easy for large groups of people who have never met to work together
- it super-charges innovation: crowds of people can develop new ideas faster than isolated geniuses and disseminate them even faster.

# Wikinomics and Web 2.0: Collaborative Innovation

# Thessaloniki's Innovation Zone: VISION

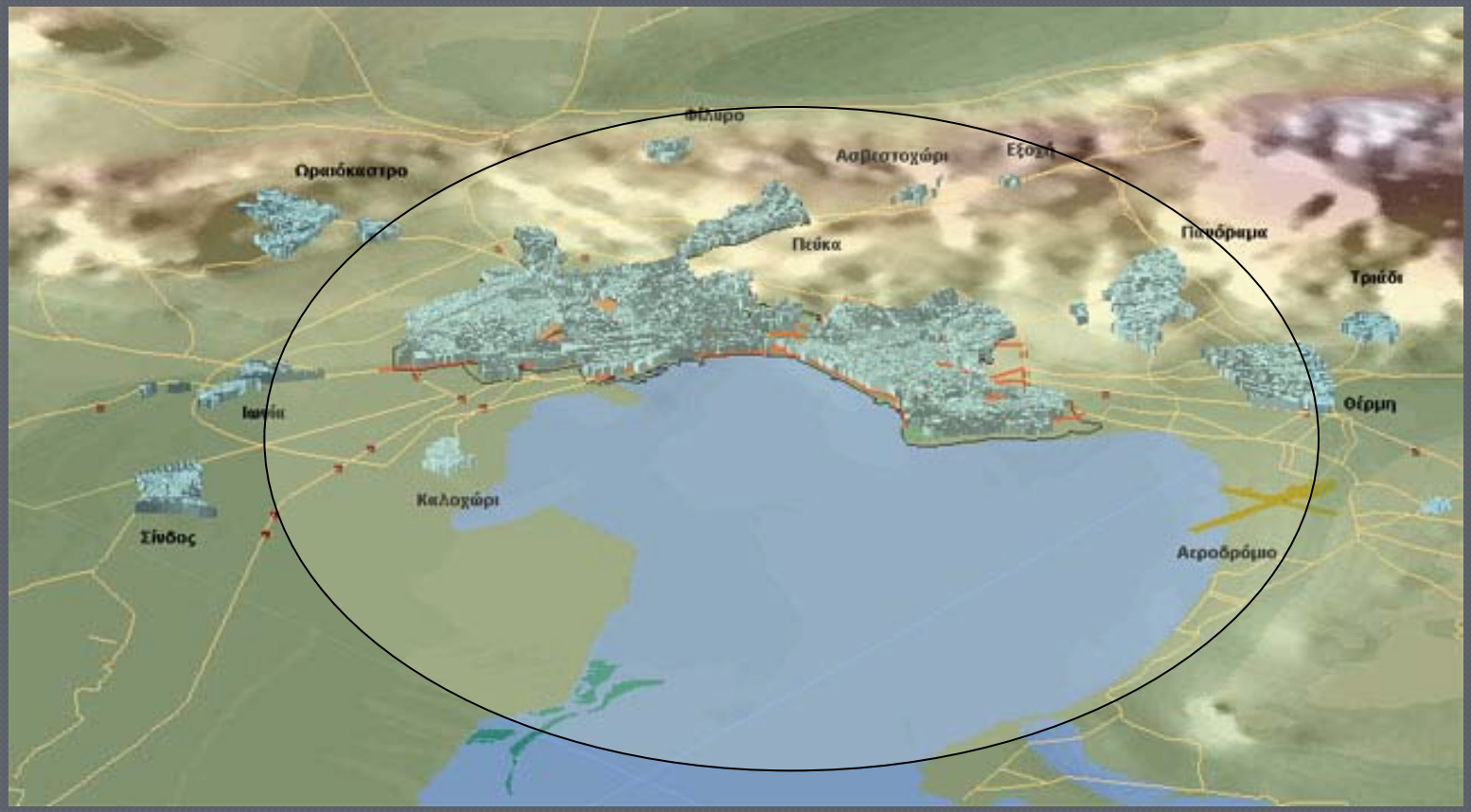
**To become an internationally recognized innovation hub, leading knowledge development and knowledge-based entrepreneurship in SE Europe.**

**www.thessinnozone.gr**

# Thessaloniki's Innovation Zone: MISSION

- Alignment of all relevant local, regional, national and forces from the Diaspora along the VISION of the Zone, aiming at its materialization.
- Creation of an enabling environment that will foster innovation by
  - using all existing resources, adding missing ones and closing the gaps for facilitating all steps from research to commercialization of Universities and R&D Institutions outputs,
  - bridging industry and business with these institutions thus providing a fertile ground for knowledge intensive companies and institutions from Greece & abroad.

# Spatial Concentration of Innovation Stakeholders in Eastern Thessaloniki



# Objectives (1&2)

1. Raise Thessaloniki's R&D , innovation and entrepreneurship profile as a learning / research and knowledge generation center, internationally.

1. Upgrade the profile of the Region in the EU by:
   - transforming more of the R&D outputs to IP products and cultivating the relevant culture within the research community.
   - increasing the level of interaction between University /R&D Institutions and knowledge intensive industries ( both local and international).
   - establishing an environment enabling advanced entrepreneurship.

# Objectives (3&4)

3. Create an attractive environment for:
   - FDI in knowledge-based industries
   - Local and foreign researchers alike
   - Tech start-ups from SE Europe

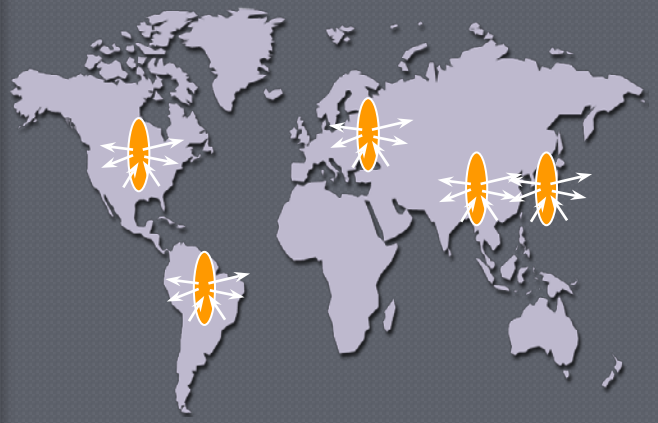
   that could support companies to emerge as internationally oriented businesses.

4. Create a new pole of economic growth in Thessaloniki / Macedonia / Greece and new employment opportunities for graduates of the Region's Universities.

# Key Trends in Global Supply Chains

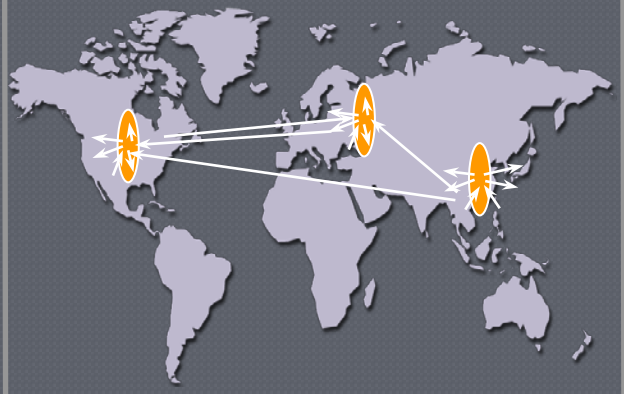
## Adoption of source, build, sell anywhere model

### Regional Build and Sell, Local Parts Sourcing



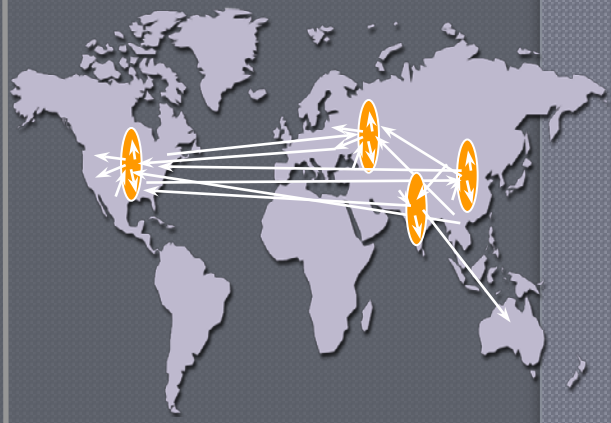
Supply Chain Costs as a % of Total Cost = < 3- 5%

### Regional Build and Sell with Global Parts Sourcing



Supply Chain Costs as a % of Total Cost = 10%- 25%

### Global Footprint – Global Build, Global Sell, Global Source (Cross Border Trade)



Supply Chain Costs as a % of Total Cost = 15%- 35%

- **Growing importance of supply chain management**
  - The Flat World, The Round World, The Real World
  - Horizontal expansion – Bidirectional propagation
  - Globalization driving Structural Changes
  - Decrease in piece cost and increase in supply chain costs

# CHANGE
## Main Consequences

- **INCREASING COMPLEXITY**
  More variables & relationships
- **INCREASING RISK**
  Higher stakes & volatility, increasing threats
- **INCREASING UNCERTAINTY**
  More discontinuities & surprises.

# Limitations of Offshoring

**UNTIL RECENTLY**

- Offshoring's success hinged upon:
  - Low production costs
  - Cost efficient supply chain networks (economies of scale for containerized cargo)

**HOWEVER**

- Lengthy and unpredictable transportation times &
- High customs clearance and service times
  - Affect the *responsiveness* of a supply chain.
- Transporting cargo over long travel distances
  - Releases various *emissions*.

# Nearshoring

- By capturing the impact of:
  - Order lead times on pipeline and strategic safety stock
  - The increased emissions produced

  Offshoring may **not** always prove to be optimal.

- This perspective has led managers to scrutinize the merit of new practices for supply chain network design.

  An outcome of this scrutiny is nearshoring.

  The allocation of a portion of the supply chain's capacity close to its serving markets.

# Need for a New Decision-Making Paradigm

- Trade facilitation bottlenecks and sustainability have emerged as critical issues for the design of global supply chains.
- => Development of novel methodological strategic decision frameworks that will identify:
  - optimal nearshore/offshore production allocation capacity
  - additional effect of sustainability on SC network design
  - the effect of trade facilitation bottlenecks on supply chain network design.

# A "Total Landed Cost" Mindset

- Development of a novel "total cost" methodological framework for strategic global logistics network design taking into account real parameters that need to be addressed by today's managers and C-level executives of globalized supply chains.
- Would need to capture systemically :
  - The practice of nearshoring.
  - The impact of sustainability on $CO_2$ emissions related costs
  - The impact of trade-facilitation related variability to "door-to-door" lead times.

# Cost Structure

- Production cost
  - proportional to the volume of products produced at each factory
- Transportation cost
  - depends on the selected route and is proportional to the # of containers transported
- Pipeline holding cost
  - depends on the total order lead time
- Strategic safety stock holding cost
  - depends on lead time demand and market's service level
- Emissions cost
  - proportional to the tons of $CO_2$ emitted at each route

# Green Supply Chain Management

- Managing all stakeholders of the Supply Chain where we take environmental aspects and durability into account

- Main elements:
  - Green Supply Chain Planning
  - Green Procurement and Sourcing
  - Green Supply Chain Execution
  - Carbon Management
  - Green Supply Chain Performance Evaluation.

# How Serious is Green?

- Up to recently – lip service?
- Are customers willing to buy green products at higher costs?
- Corporate Social Responsibility (CSR)
- Emissions of Gases (esp. $CO_2$) are gradually becoming the issue
- Green = Lean (it saves money!)
- Many initiatives and carbon trading are upcoming
- Addressing green aspects is vital for building new infrastructure in the EU.

# GSCM at the Corporate Strategic Agenda

- For the C-level executives Green Supply Chain Management offers a systemic approach to holistically manage their entire business to:
  - satisfy their CSR obligations and
  - meet "bottom Line"/profitability targets
- Improved environmental performance implies lower waste, lower training costs and reduced material costs
- Green Supply Chains have a positive long term impact on the financial performance of the organization.
  - Source: *"Green Supply Chains"*, by S. Emmett and V. Sood

# GSCM at the Corporate Strategic Agenda

- A 2010 Capgemini study of 300 leading companies across the globe reveals that:
  - >58% of SC managers state as their main business driver for 2010 is "meeting changing customer requirements"
  - >50% of companies will start-up or continue with operational excellence / LEAN
  - Sustainability is the second most important business driver for 2010, up 16% over 2009.
- Increased emphasis of GSCM in developing a successful business strategy!

# Benefits of GSCM

1. Improves logistics ability by helping companies mitigate risks and accelerate innovations
2. Increases adaptability by fostering innovative processes and continuous improvement
3. Promotes alignment, by developing a platform for negotiating policies among suppliers and customers.

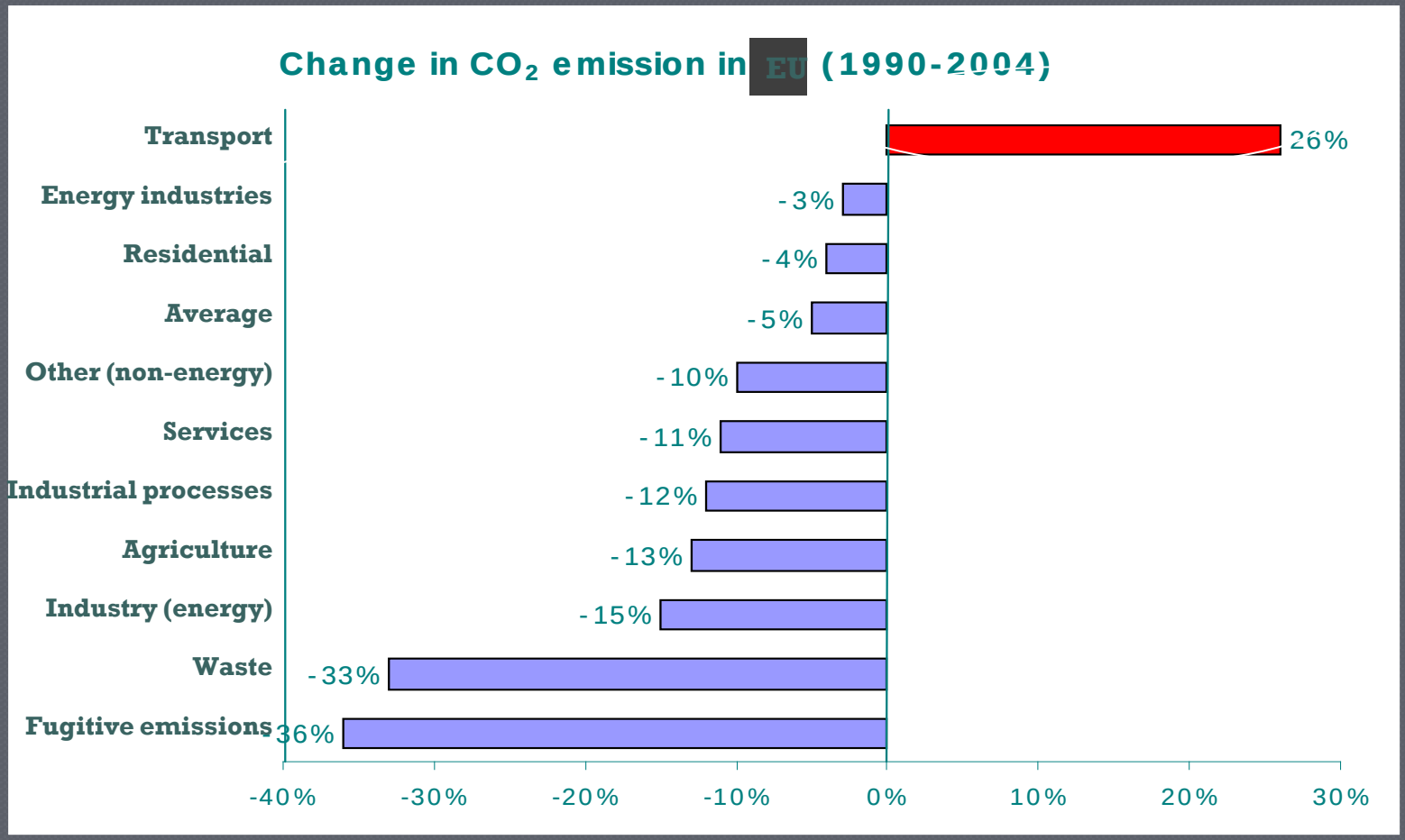
# Green Logistics

- Green Logistics has attracted by far the most attention of GSCM
- Elements:
  - Transportation
  - Facilities
  - Products
  - Reverse Logistics.

# Issues with Green SCM

- Evolving legislation and rules of carbon trading are unclear and not always fair (also prone to corruption)
- Transportation being an easier target, is more under pressure than consumption
  - Logistics contributes 5.5% of total greenhouse gas emissions
  - Transportation responsible for 89% (rest due to warehouse and distribution facilities)
  - Road freight is responsible for >50% of CO2 emissions in the transport sector, ocean for 20%, rail and air for the remainder.
- Can the transportation sector pay increased taxes on fuel?
- Difficulties on building consensus at the international level (e.g. Copenhagen).

**Transportation - An important source of $CO_2$.** Due to increased outsourcing, transportation is the only sector that has increased $CO_2$ emissions in the last two decades. *Source: European Logistics Users Providers and Enablers Group (ELUPEG)*



# Emission Trading Scheme

- EU trading scheme in place since 2005-2007 (Phase 1)
- Phase 2: 2008-2012 putting a cap while allowing the trading of emissions
- Major installations are included (over 20 MW)
  - Aviation is to be included with the maritime sector a candidate as well
- In Phase 1, the price of $CO_2$ rose up to 30€/ton and collapsed to 0.1€/ton in September of 2007 (as it became evident that too many rights had been issued)
- Stricter caps are to be expected for 2013 and beyond.

# Cap and Trade

- Advantage: it measures carbon at the aggregate level without caring which company reduced carbon emission as long as the aggregate achieves the desired target.
- Disadvantages:
  - as carbon permit price is determined by the market, planners face great uncertainty in making decisions (reduce carbon footprint below the cap and trade, or violate the cap and purchase permits?)
  - Implementation is difficult: How should a government allocate initially permits without allowing companies to profit just from market price trading without any real activity.
  - Prone to corruption and fraud.

# Carbon Tax

- As tax rates will be known in advance the cap and trade profit-related problems do not exist
- However, a carbon tax **does not consider** the aggregate level of emissions
  - Thus, it would not allow for "underachieving" for few companies taking into account that others have "overachieved".

# Impact on Optimal SC Network Design

The tighter the cap on carbon emission:

- The more Distribution Centers will be needed to reduce outbound transportation costs
- The more significant is the role of packaging as it can reduce transportation
- Shifting cargo moves from track to rail and air to sea is desirable
- Near-shoring
- Outsourcing (myopically).

# 7 Key Steps to a Green Supply Chain

1. Optimize routing and consolidation
2. Improve fleet visibility
3. Automate tasks and communication
4. Improve packaging strategies
5. Enact energy conservation strategies in the warehouses
6. Improve labor management processes and practices
7. Increase global transport efficiency.

*Source: SCDigest, RedPrairie*

# Trading Across Borders

- Import Delays
- Inspections
- Customs Reform
- Electronic Filing
- Regional Transport
- Corruption.

# Trade Facilitation Steps

- Modernization of Customs and Border-crossing controls
- Streamlining of Documentary Requirements and Information Flows
- Automation (EDI, XML)
- Ports' and Airports' Efficiency
- Development of Logistics Services
- Transit and Multimodal Transport
- Transport Security
- Transport Infrastructure Investments.

# Why Predictable and Reliable Supply Chains Matter?

- Companies aside the direct logistics have to sustain costs for hedging against the unpredictability and lack of reliability of their supply chains:
  - By holding Safety Stocks-Inventories
  - By switching to emergency transportation modes to meet schedules.

# The Logistics Performance Index

- Captures comprehensively supply chain performance:
  - Customs procedures, logistics costs, infrastructure quality
  - Ability to track and trace shipments
  - Timeliness in reaching Destination
  - Competence of domestic logistics industry.

*Source: "Connecting to Compete: Trade Logistics in the Global Economy", International Bank for Reconstruction and Development, World Bank, 2007&2010*

# The Logistics Performance Index

- It provides the first in-depth cross-country assessment of the logistics system gap among countries.
- It uses more than 5,000 individual country assessments.
- It is complemented by qualitative and quantitative indicators of the domestic logistics environment, institutions, and performance of supply chains (efficiencies, costs, delays, predictability, variability).
- Countries that top the LPI ranking are typically key players in the logistics industry, attracting FDI.

# The Logistics Performance Index

- The LPI of a country is scaled between 1-5 and is based on its:
  - customs clearance process efficiency,
  - logistics infrastructure,
  - ability to handle international shipments,
  - local logistics industry competence,
  - ability to track and trace international shipments,
  - domestic logistics costs, and
  - timeliness of shipments in reaching destination.

# The Logistics Performance Index

| | LPI | | | | LPI | | | | LPI | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Rank | Score | % of highest performer | | Rank | Score | % of highest performer | | Rank | Score | % of highest performer |
| Germany | 1 | 4.11 | 100.0 | Vietnam | 53 | 2.96 | 63.1 | Cameroon | 105 | 2.55 | 49.7 |
| Singapore | 2 | 4.09 | 99.2 | Greece | 54 | 2.96 | 62.8 | Niger | 106 | 2.54 | 49.4 |
| Sweden | 3 | 4.08 | 98.8 | Qatar | 55 | 2.95 | 62.6 | Nicaragua | 107 | 2.54 | 49.3 |
| Netherlands | 4 | 4.07 | 98.5 | Costa Rica | 56 | 2.91 | 61.3 | Jamaica | 108 | 2.53 | 49.2 |
| Luxembourg | 5 | 3.98 | 95.7 | Slovenia | 57 | 2.87 | 60.2 | Côte d'Ivoire | 109 | 2.53 | 49.2 |
| Switzerland | 6 | 3.97 | 95.5 | Senegal | 58 | 2.86 | 59.8 | Pakistan | 110 | 2.53 | 49.1 |
| Japan | 7 | 3.97 | 95.2 | Romania | 59 | 2.84 | 59.1 | Armenia | 111 | 2.52 | 48.9 |
| United Kingdom | 8 | 3.95 | 94.9 | Oman | 60 | 2.84 | 59.1 | Bolivia | 112 | 2.51 | 48.5 |
| Belgium | 9 | 3.94 | 94.5 | Tunisia | 61 | 2.84 | 58.9 | Gambia, The | 113 | 2.49 | 48.0 |
| Norway | 10 | 3.93 | 94.2 | Kazakhstan | 62 | 2.83 | 58.9 | Turkmenistan | 114 | 2.49 | 47.9 |
| Ireland | 11 | 3.89 | 92.9 | Bulgaria | 63 | 2.83 | 58.8 | Chad | 115 | 2.49 | 47.9 |
| Finland | 12 | 3.89 | 92.6 | Malta | 64 | 2.82 | 58.6 | Congo, Rep. | 116 | 2.48 | 47.4 |
| Hong Kong, China | 13 | 3.88 | 92.4 | Dominican Republic | 65 | 2.82 | 58.5 | Ghana | 117 | 2.47 | 47.3 |
| Canada | 14 | 3.87 | 92.3 | Uganda | 66 | 2.82 | 58.4 | Lao PDR | 118 | 2.46 | 47.0 |
| United States | 15 | 3.86 | 91.7 | Peru | 67 | 2.8 | 57.9 | Albania | 119 | 2.46 | 46.8 |
| Denmark | 16 | 3.85 | 91.4 | Uzbekistan | 68 | 2.79 | 57.5 | Comoros | 120 | 2.45 | 46.5 |
| France | 17 | 3.84 | 91.3 | Benin | 69 | 2.79 | 57.4 | Montenegro | 121 | 2.43 | 45.9 |
| Australia | 18 | 3.84 | 91.2 | Honduras | 70 | 2.78 | 57.1 | Gabon | 122 | 2.41 | 45.4 |
| Austria | 19 | 3.76 | 88.7 | Ecuador | 71 | 2.77 | 57.0 | Ethiopia | 123 | 2.41 | 45.4 |
| Taiwan, China | 20 | 3.71 | 86.9 | Colombia | 72 | 2.77 | 57.0 | Papua New Guinea | 124 | 2.41 | 45.3 |
| New Zealand | 21 | 3.65 | 85.0 | Macedonia, FYR | 73 | 2.77 | 56.9 | Maldives | 125 | 2.4 | 45.1 |
| Italy | 22 | 3.64 | 84.9 | Croatia | 74 | 2.77 | 56.8 | Djibouti | 126 | 2.39 | 44.8 |
| Korea, Rep. | 23 | 3.64 | 84.7 | Indonesia | 75 | 2.76 | 56.5 | Liberia | 127 | 2.38 | 44.4 |
| United Arab Emirates | 24 | 3.63 | 84.5 | Paraguay | 76 | 2.75 | 56.3 | Bhutan | 128 | 2.38 | 44.3 |
| Spain | 25 | 3.63 | 84.3 | Uruguay | 77 | 2.75 | 56.3 | Cambodia | 129 | 2.37 | 44.0 |
| Czech Republic | 26 | 3.51 | 80.5 | Bahamas, The | 78 | 2.75 | 56.1 | Algeria | 130 | 2.36 | 43.7 |
| China | 27 | 3.49 | 79.9 | Bangladesh | 79 | 2.74 | 56.0 | Tajikistan | 131 | 2.35 | 43.2 |
| South Africa | 28 | 3.46 | 78.9 | Syrian Arab Republic | 80 | 2.74 | 55.9 | Libya | 132 | 2.33 | 42.8 |

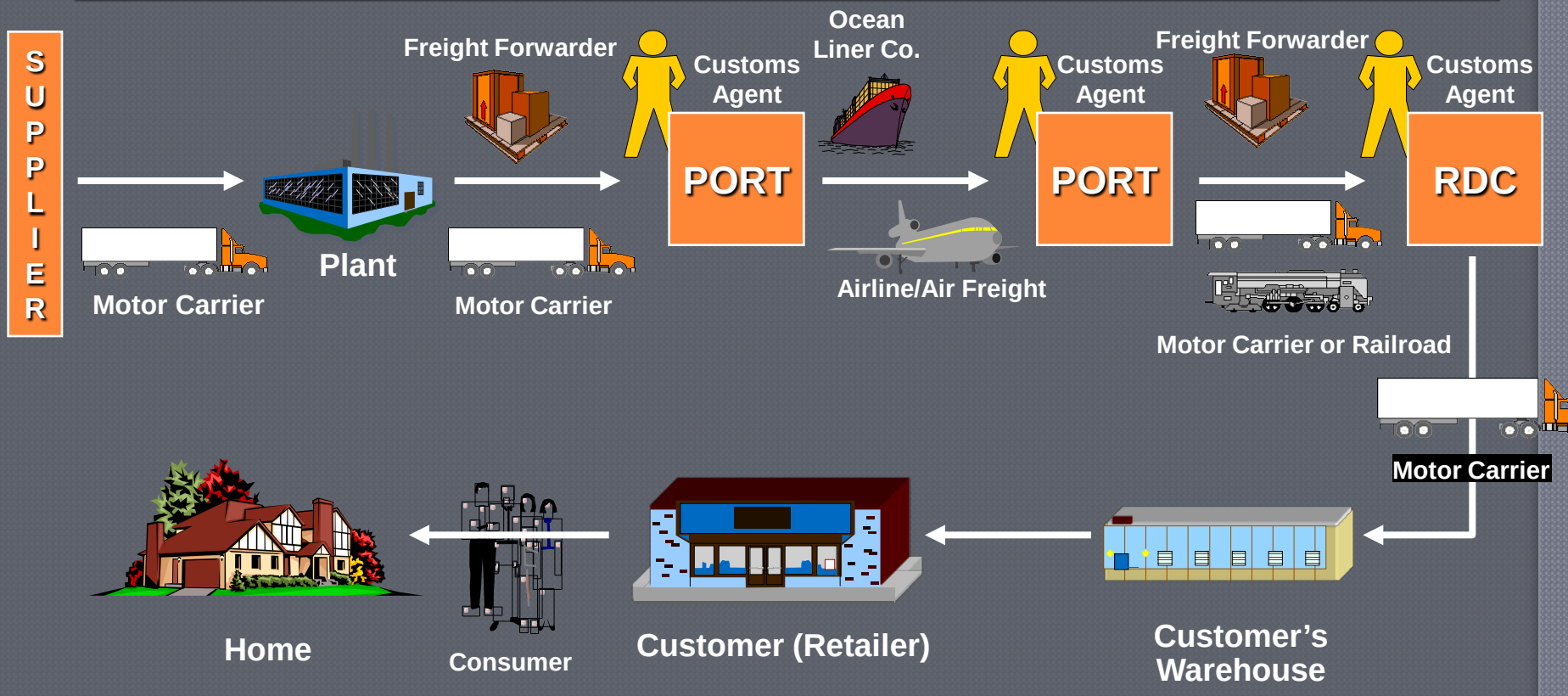
# Few Results of the World Bank Study

- Direct relationship between logistics performance and FDI
  - This further facilitates access to new technology, know-how increasing the rate of productivity growth
- Good logistics performers benefit from globalization!

# Factors Affecting Logistics Performance

- Quality of Infrastructure
- Competence of Private and Public Logistics Service Providers
- Customs-Border Agencies
- Transparency-Corruption
- Supply Chain Reliability.

# New Paradigm for Logistics Management

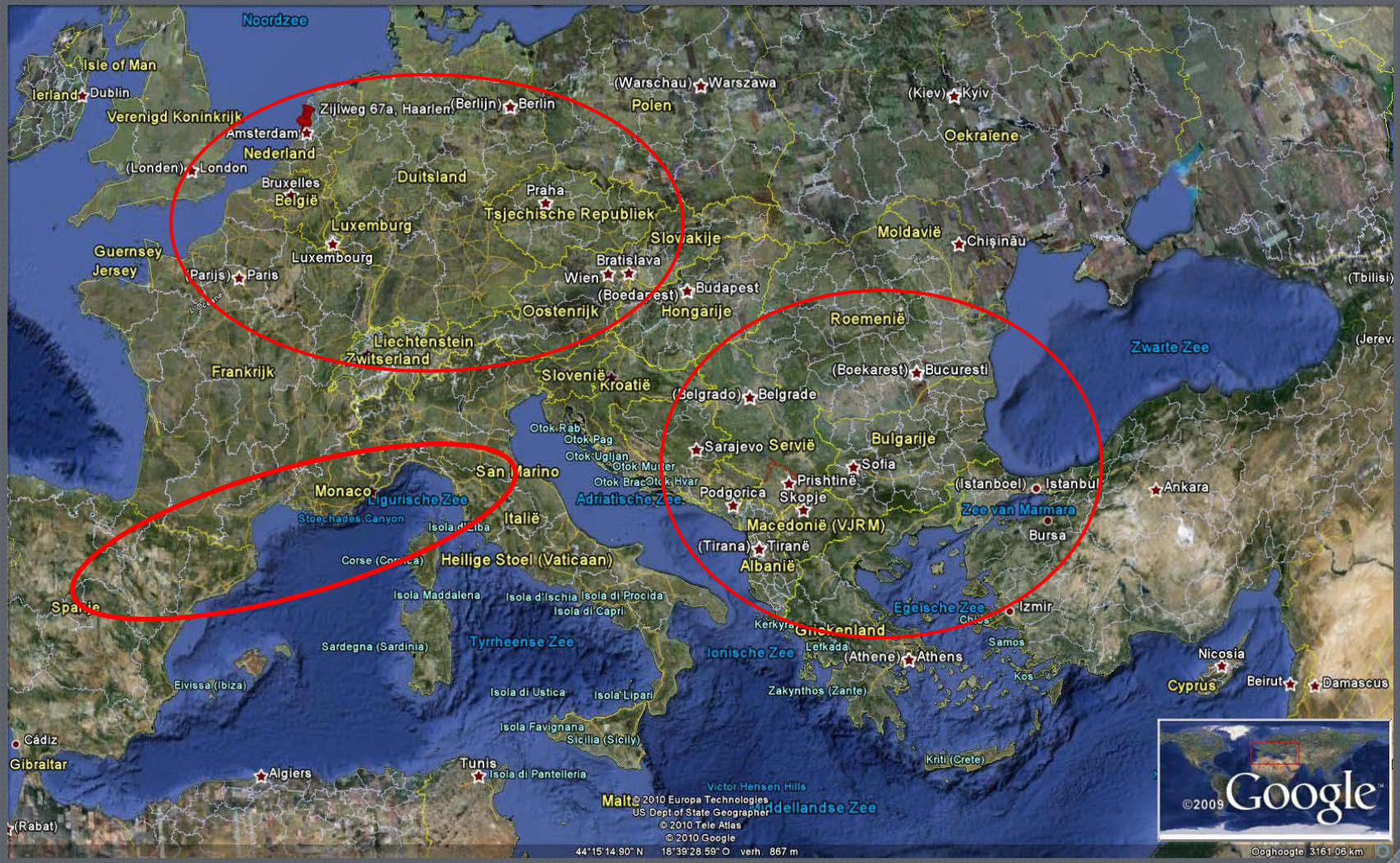



Plan | Buy | Make | Move | Sell

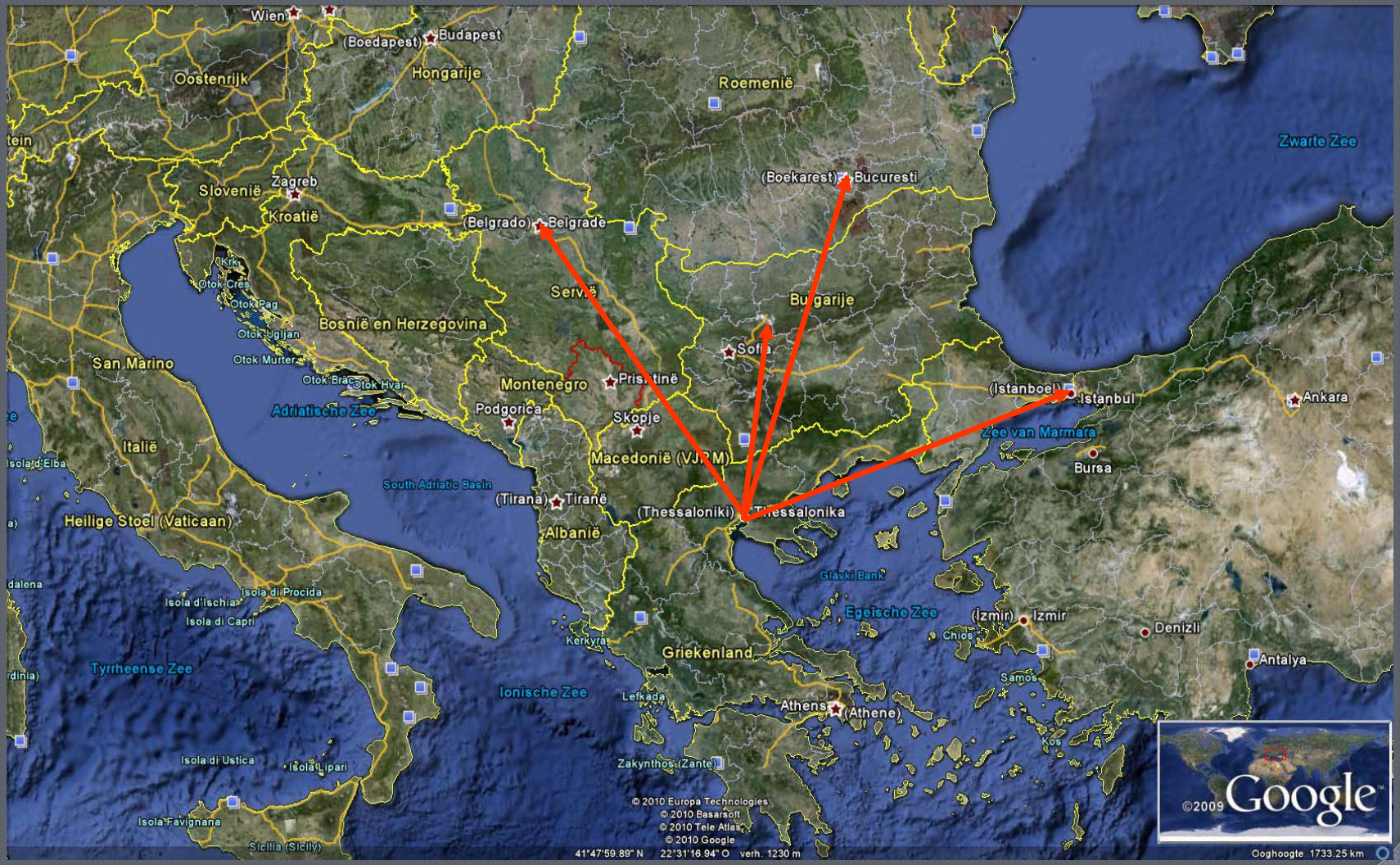
# Greek Port Capacity

- New opportunities for the Port of Piraeus with the concession to COSCO for managing container terminals (transhipment port)
- The bid for the Port of Thessaloniki did not flourish (Dec. 2009)
  - What's next for the ThPA? Gateway port for the Eastern European market with a track record of 10-15% annual trade growth over the last 10 years (McKinsey, 2011)

# Position of Greece in development eastern Europe / middle east



# …and logistics and become the Gateway to eastern Europe



# Strengths / Opportunities for the Port of Thessaloniki

- Direct access to the trans-european network
  - Egnatia Road, Corridors IV & X
- Free Zone (one of the few in the EU) in proximity with all the SE countries
- Great demand and potential for developing value-added services (logistics, supply chain management).
- Threats: Ports of Varna (Bulgaria), Ambarli (Turkey) and Constanza (Romania) with better operational stability and improved services with up to 50% lower unloading and custom clearance time

# Strengths / Opportunities for the Port of Thessaloniki

- Existence of space (and buildings) within the old port for commercial development (e.g. hotels?)
- Development of an Institute for Education and Certification for Port-related professions
  - Demand from ports in SE Europe, North Africa, Cyprus
- After the withdrawal of Hutchinson:
  - Potential for flexible forms of collaborative partnerships in running Port activities.

GREEK ASSOCIATION OF SUPPLY CHAIN MANAGEMENT

# 15th PANHELLENIC LOGISTICS CONFERENCE

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ON SUPPLY CHAIN MANAGEMENT

SUPPLY CHAIN NETWORKS
FOR UNLEASHING GROWTH
THROUGHOUT SOUTHEAST EUROPE

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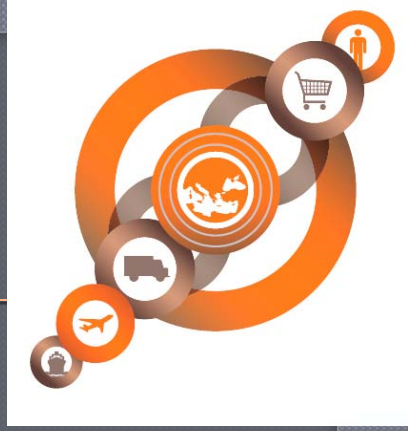
## Scope of the Conference and Congress

Responding to the demands of business and societal stakeholders in the wider Southeast European area, the common theme of the Conference and the Congress is **"Supply Chain Networks for Unleashing Growth throughout Southeastern Europe"**. Both events aim to provide a venue where practitioners and academicians alike, will address critical issues of supply chain management and logistics as catalysts for unleashing economic growth in Greece and throughout the region of Southeastern Europe.



## Tentative Thematic Areas

- Container Terminals and Port Management
- Maritime Logistics / Motorways of the Seas throughout SE Europe
- Logistics, Free Trade Facilitation and Policy-making in SE Europe
- Innovation, ICT and Logistics
- Green Supply Chain Networks
- Energy Logistics Networks.

## Special Issues of Academic Journals

Selected high quality papers that will be submitted to the 1st Southeast European Congress on Supply Chain Management will be recommended for publication in Special Issues of the following peer-reviewed journals (Inderscience Publishers):

***1. International Journal of Logistics Economics and Globalisation and***

***2. International Journal of Innovation and Regional Development.***


For additional information contact the Conference Secretariat:

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conferences & events

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# Conclusions

- The globalized economic landscape imposes new challenges and opportunities for innovation to global supply chain management and logistics.
- We first outlined the global landscape of innovation and entrepreneurship that leads into new challenges for global supply chain management and the need for a novel comprehensive "total landed cost" paradigm.
- We motivated the need for a new decision-making framework for the design of global supply chains that takes into account nearshoring, sustainability and the performance of national logistics systems.

# The End

## Thank you for your attention!

eiakovou@auth.gr

http://im.meng.auth.gr/lascm/index.html