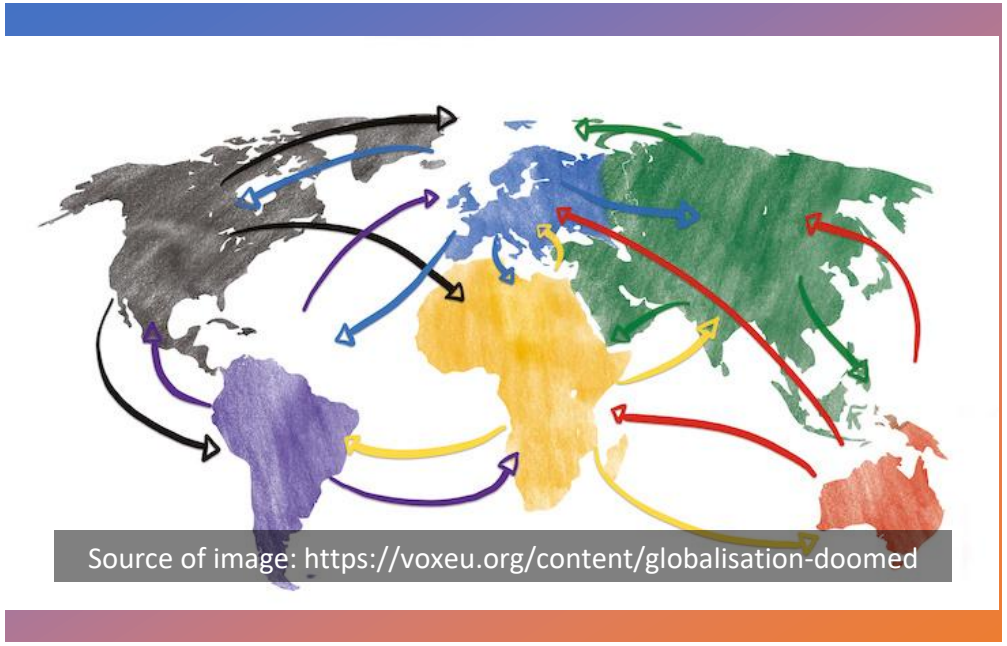
Fighting Through Climate Chaos

Dr Gokcay Balci
Lecturer in Sustainable Freight Transport and Logistics

Institute for Transport Studies
University of Leeds

Agenda

- Logistics as the contributor to and victim of climate change.
- Geopolitics worsen climate change impacts
- Recent climate and geopolitical events disrupting logistics
- Are there win-win solutions?

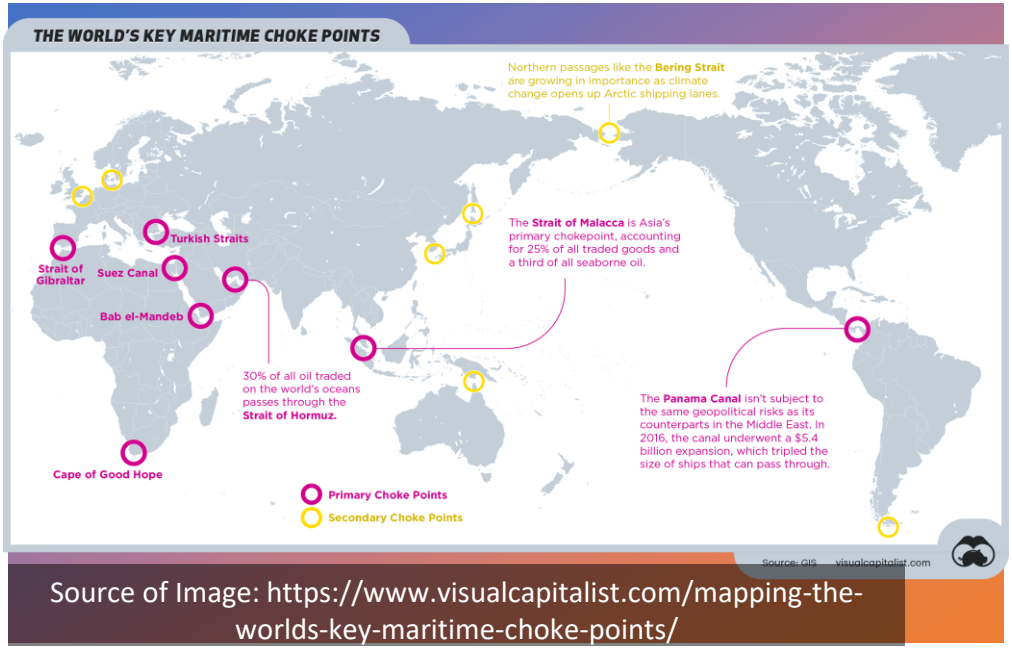


Source of image: https://voxeu.org/content/globalisation-doomed

Why are supply chains so vulnerable to disruptions?

- Globalisation & outsourcing
- Efficiency paradigms of lean processes
- Increased specialization & geographical concentration of manufacturing
- Most trade depends on few chokepoints and transport nodes.

Supply chains: companies shift from 'just in time' to 'just in case'



Source of Image: https://www.visualcapitalist.com/mapping-the-worlds-key-maritime-choke-points/

Climate change impact on global logistics

- Logistics – physical movement of goods – is highly vulnerable to climate-related events
  - Extreme weather
  - Flood
  - Drought

BBC Sign in Home News Sport Weather iPlayer

NEWS

Home | InDepth | Israel-Gaza war | War in Ukraine | Climate | UK | World | Business | Politics | Culture

Business | Economy | Technology of Business | AI Business

Droughts leave cargo riverboats high and dry

9 February 2023

SHIPPINGWATCH

CONTAINER LOGISTICS BULK TANKER REGULATION MORE

CARRIERS

Rhine remains closed to ship traffic due to high water levels

The transport of goods on the Rhine is suspended in southern Germany, where the water is so high that ships cannot pass under the bridges.

Port of Valencia reopens after devastating floods

The port's three terminals reopened this morning after being closed following flooding in the region

06 Nov 2024 | NEWS

by Lloyd's List

Climate change impact on global logistics

Rising sea levels pose threat to seaports and logistics infrastructure

2-5 **feet** increase by 2100

Not only transport networks and ports but also **warehouses** are vulnerable to climate-related events

9,897 warehouses (more than 10%) in the UK are at **high risk of flood** (Climate Change Committee, 2023)

Global logistics fuel climate change — and climate change, in turn, disrupts global logistics.

- Freight transport alone accounts for almost 10% of global energy-related CO2 emissions.
  - with this figure rising to almost 12% when including emissions from warehouses and ports (McKinnon, 2024).
- The contribution of logistics to climate change is projected to increase in future if no intervention is made

Geopolitics intensify logistics' impact on climate change

- Armed conflicts increased the **average total distance travelled** in shipping.
  - Houthi attacks caused ships to travel through the Cape of Good Hope
  - Increased sailing times between Asia-Europe for at least 10 days (35% longer).
  - Situation is worse for nearby regions connected through Suez (Turkey and Dubai, can be over 150% longer journey)
  - At least 33% more emission is caused by diverting ships
    - **Faster ships** caused **higher emissions** (A large container vessel requires 2.2% more fuel for every 1% increase in speed.

Source of image: https://theconversation.com/red-sea-crisis-supply-chain-issues-set-to-continue-despite-gaza-ceasefire-248469

Geopolitics intensify logistics' impact on climate change

- Geopolitical tensions can push freight onto higher-emission air routes
  - Tariffs and Suez Canal disruptions have forced some shipments onto higher-emission air freight

Trump tariffs + Add to myFT

Air freight costs surge as Trump tariffs trigger rush to fly in goods

Price of sending products to US from China has climbed 37% since start of March

FINANCIAL TIMES

COMPANIES TECH MARKETS CLIMATE OPINION LEX WORK & CAREERS LIFE & ARTS HTSI

Supply chains + Add to myFT

Shippers turn to air freight to alleviate Red Sea crisis

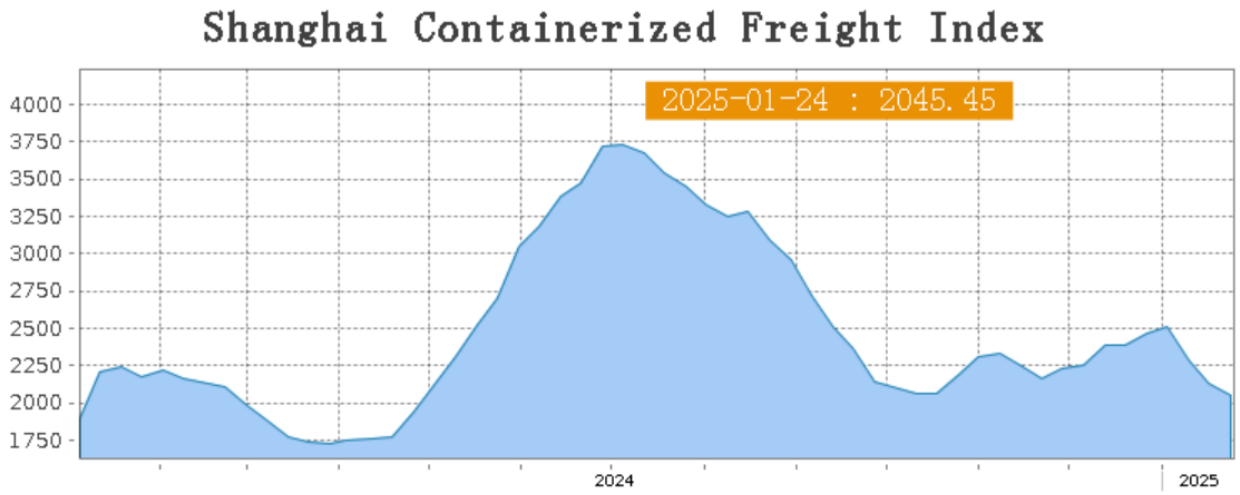
Mix of sea and air favoured to avert delays on Asia-Europe routes while limiting costs

When Geopolitics and Climate Change Collide: The Dual-Canal Disruption

- Both the Panama Canal and the Suez Canal were disrupted at the same time—one by climate-driven drought, the other by geopolitics.

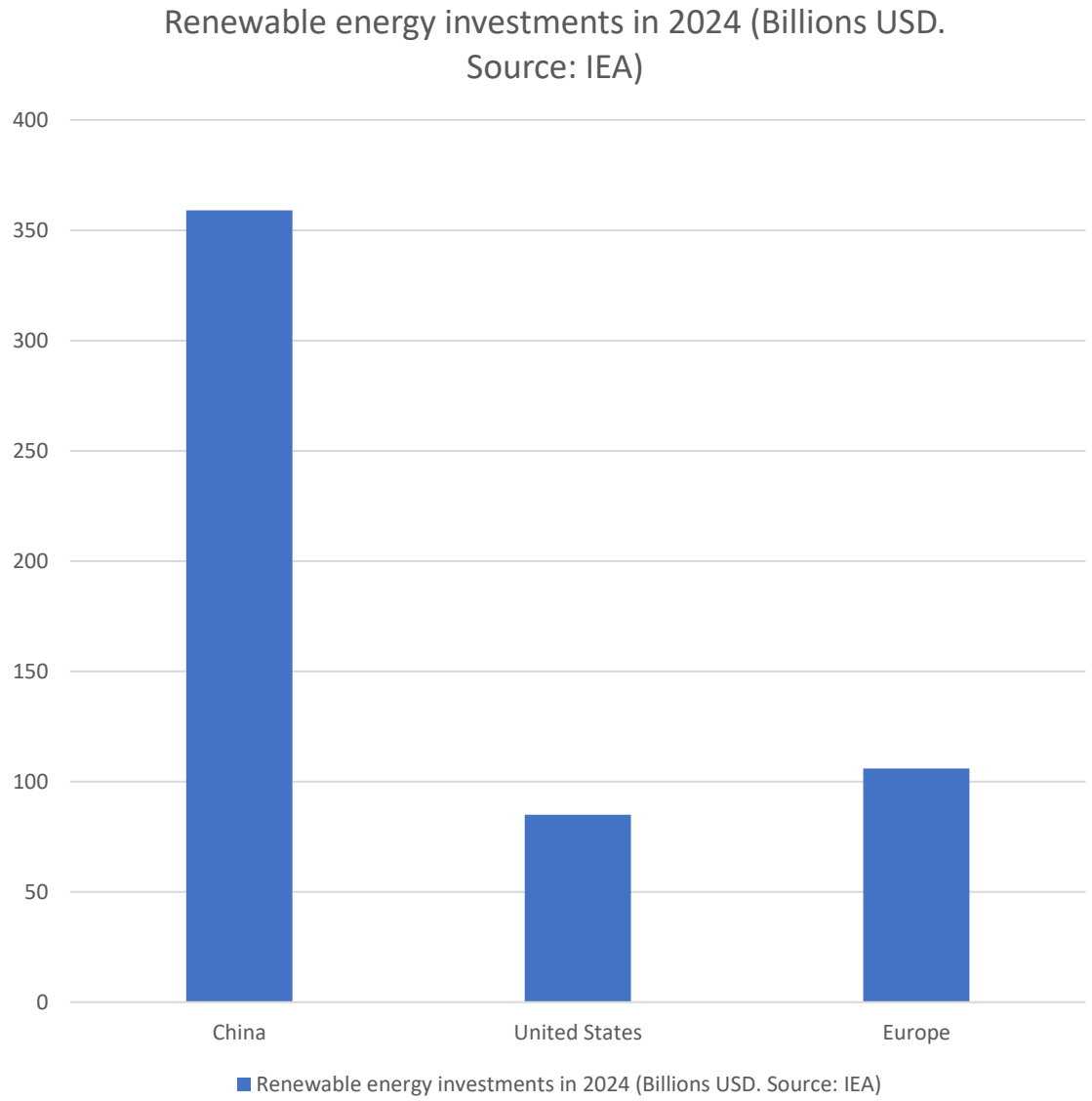
Long delays at Panama Canal after drought hits global shipping route

Number of vessels able to pass through each day limited because lower availability of water



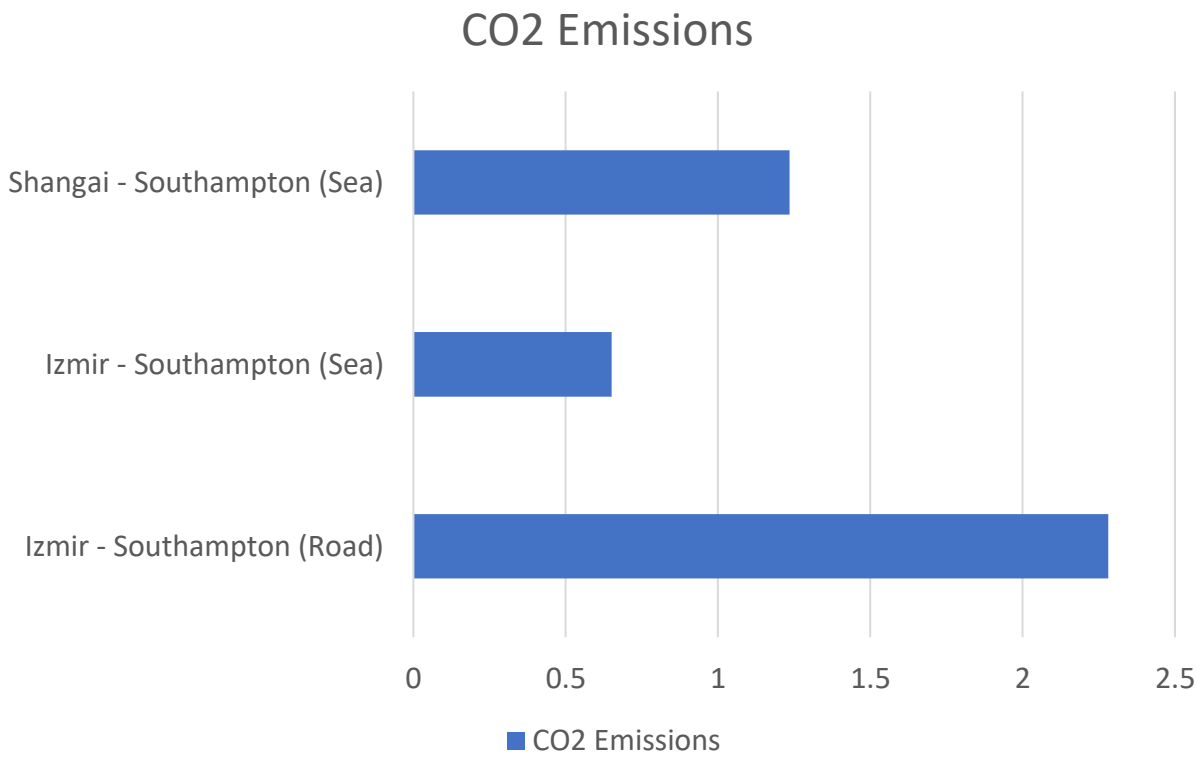
Can we find win-win solutions for climate risks and geopolitical conflict?

- Nearshoring and reshoring
  - Reshoring reduces emissions if
    - The new location uses cleaner energy or high-efficiency processes
    - International ocean legs are replaced by local rail, barge, or short-haul trucking
    - Supporting industries are also created in the new location



Can we find win-win solutions for climate risks and geopolitical conflict?

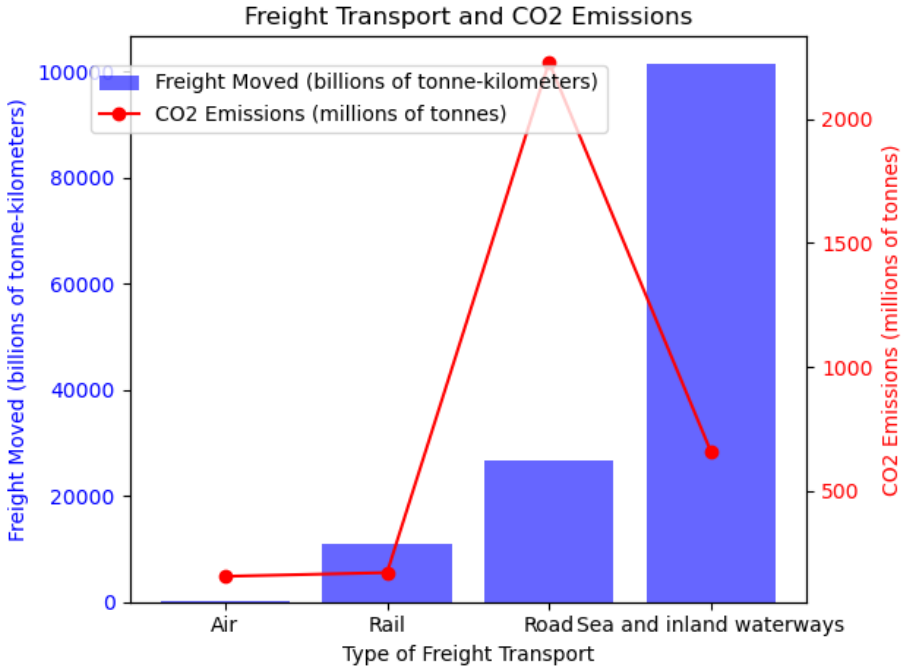
- Nearshoring can reduce transit time, total travel distance, and create alternative modes in case one is disrupted
- Will emissions decline if manufacturing is moved from China to Turkiye?



https://www.ecotransit.org/en/emissioncalculator/

Modal-shift for both resilience and decarbonisation.

- Modal shift can offer alternative transport modes and significantly reduce emissions.



RailFreight.com

HOME | BUSINESS | ASIA-EUROPE | INTERMODAL | POLICY | TECHNOLOGY | INFRASTRUCTURE | IN

MULTIMODALITY

Rail freight to compensate for low water levels on river Rhine

Published on 14-04-2025 at 10:45

What can logistics sector (and governments) do to fight through climate chaos? - cutting emissions while staying resilient to climate- and geopolitics-driven disruptions

- Digitalisation – Digital twins?
- Alternative fuels?
- Collaboration for learning?
- ..
- **Human capital**
  - Logistics is a resilient sector (probably the most). After all, it is “the science of problem solving in physical movement of goods” (my personal definition). And the most resilient part of the logistics sector is People (personal opinion).
  - Complex problems need original ideas.
  - We need young generation and diverse thinking (cognitive diversity) coming from different backgrounds.

Thanks a lot for your attention and patience!

Any questions?