Halvering av ett företags transportrelaterade klimatpåverkan – vilka anpassningar och samarbeten gör det möjligt?

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Reducing transport-related climate impact within upstream supply chains
Challenges and opportunities for buying firms

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Introduction
Overview

- Freight transport is responsible for around 8% of the global GHG emissions
- Emissions rising due to increasing transport demand → urgent need for reduction
- Heavy reliance on fossil fuels
- Transport mostly not treated as a strategic function

Introduction
Aim and Research Questions

Aim: to explore how buying firms can reduce the transport-related climate impacts from their upstream supply chains and the main challenges and opportunities in doing so

RQ1: How can buying firms reduce transport emissions in their upstream supply chains?

RQ2: What are the main challenges buying firms face in their attempts to reduce transport-related climate impacts within their upstream supply chain?

Previous Research

Supplier Base & Location

Geographic location strongly influences transport emissions

Nearshoring and regional sourcing reduce distances

Collaborative supplier management enables route optimization and shipment consolidation

Lead Time Requirements

Short lead times → high-emission modes

Flexible lead times enable: shipment consolidation, slow steaming and better vehicle utilization

“Despeeding” supply chains recognized as effective for emission reduction

Production Methods

Decentralized production reduces transport demand

Additive Manufacturing (AM): enables local production and has potential to simplify supply networks

Industry 4.0 technologies (IoT, AI, blockchain) improve logistics efficiency and reduce unnecessary transport

Transport Modes

Emission intensity varies: Road: ~2× sea, ~10× rail and air freight: most carbon-intensive

Modal shift to rail and sea offers significant benefits

Intermodal solutions can overcome infrastructure limitations

Vehicles & Fuels

Transition to energy-efficient vehicles and low-carbon fuels (electricity, hydrogen, biodiesel)

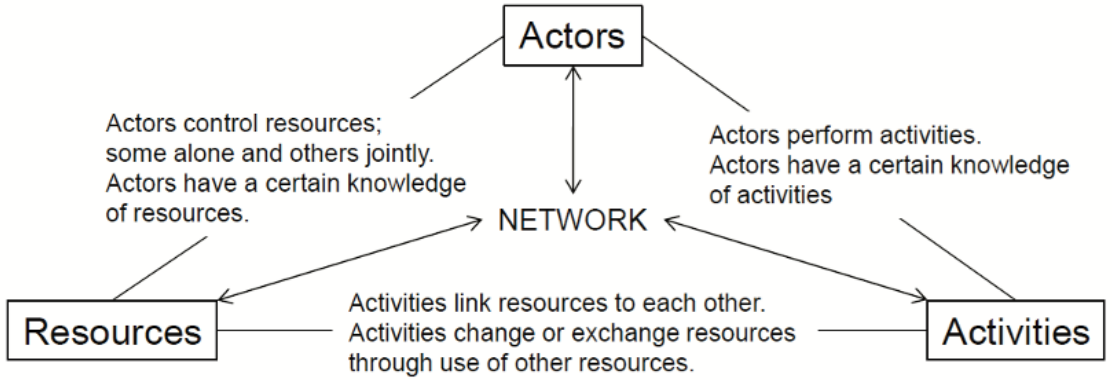
Collaboration with product suppliers and transport providers is essential

Success depends on: infrastructure availability, energy grid composition and operational practices

Frame of Reference
Industrial Network Approach (INA)

Conceptualises business landscape as a network of connected business relationships

Three analytical layers
- Actors
- Resources
- Activities



The network model (Håkansson, 1987: 17)

Highlights interdependencies and embeddedness of transport in supply networks

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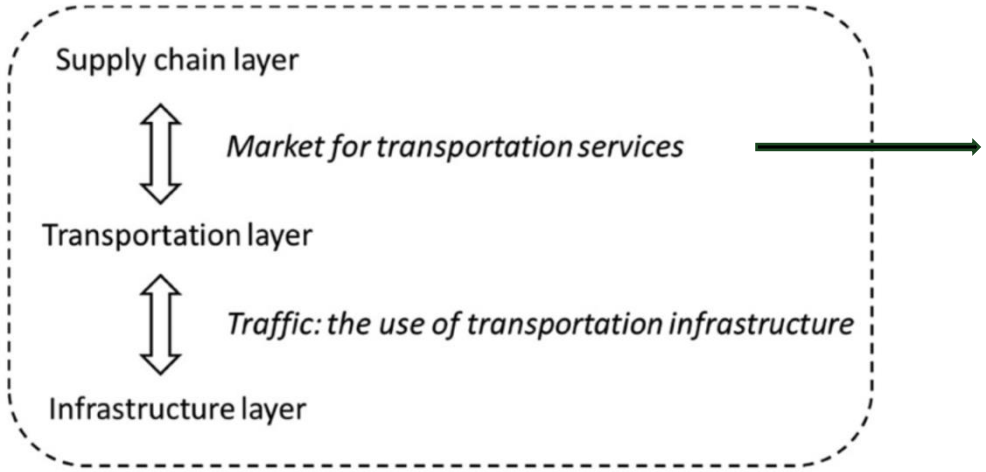
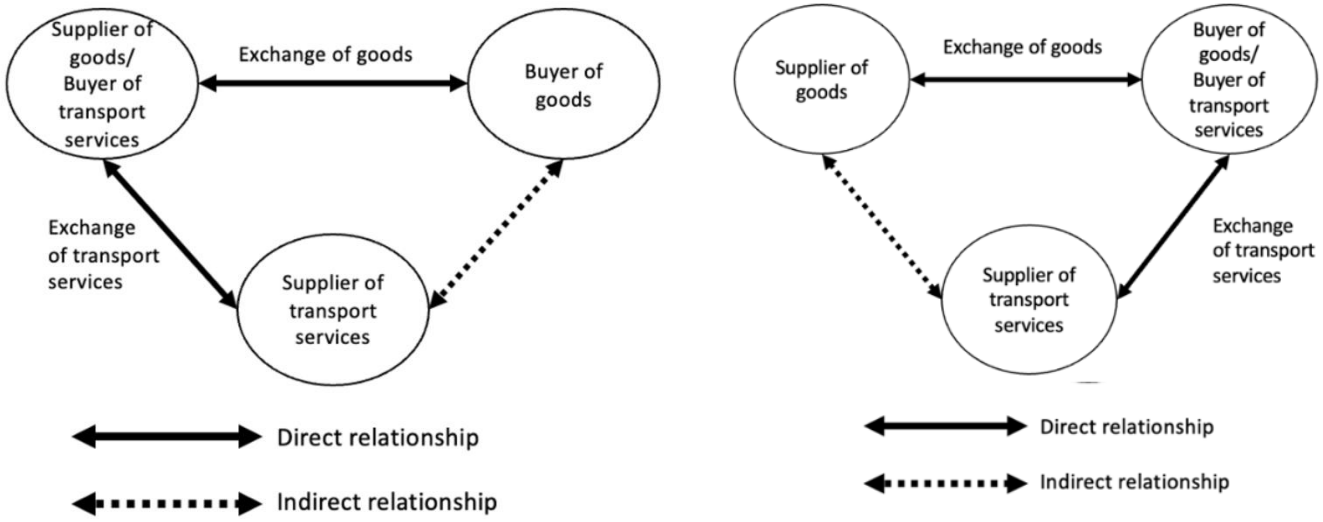
Frame of Reference
Transport Embeddedness



The transport system (Browne et al., 2023)



The Transport Service Triad (Eriksson, 2019)

The TST relies on each exchange of goods between a buyer and seller (in the supply chain layer) generating a need for transport (in the transportation layer).

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Frame of Reference
Strategic Purchasing Issues

- Purchasing is not only an operational function but a strategic activity

- Opportunities for ‘business-not-as-usual’ PSM research

- Three purchasing issues
  - Make-or-buy
  - Supply base structure
  - Nature of supply relationships

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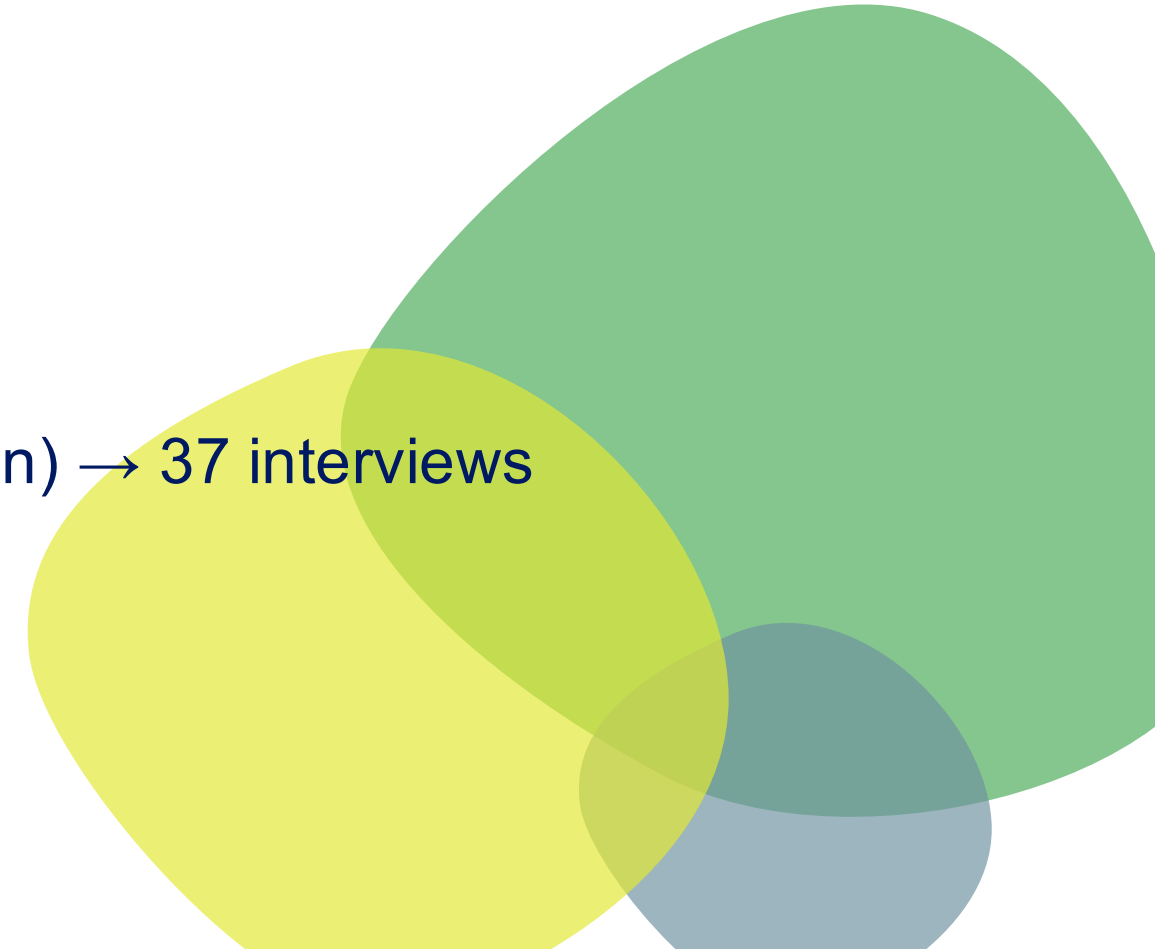
Methodological Considerations

Case study

- Started September 2022, ongoing
- Eight site visits to FMC
- Semi-structured interviews (online & in-person) → 37 interviews
- Participation in meetings and workshops



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The Case

- FMC operates in the **global energy sector**, producing large, high-value products (50–60 annually)
- **Key priorities:** Lead time (9 –10 months) and cost → climate impact gaining importance
- **Focus:** FMC's efforts to reduce transport-related climate impacts in upstream supply chains
- **Scope:** Swedish facilities, inbound transport, and related sustainability initiatives

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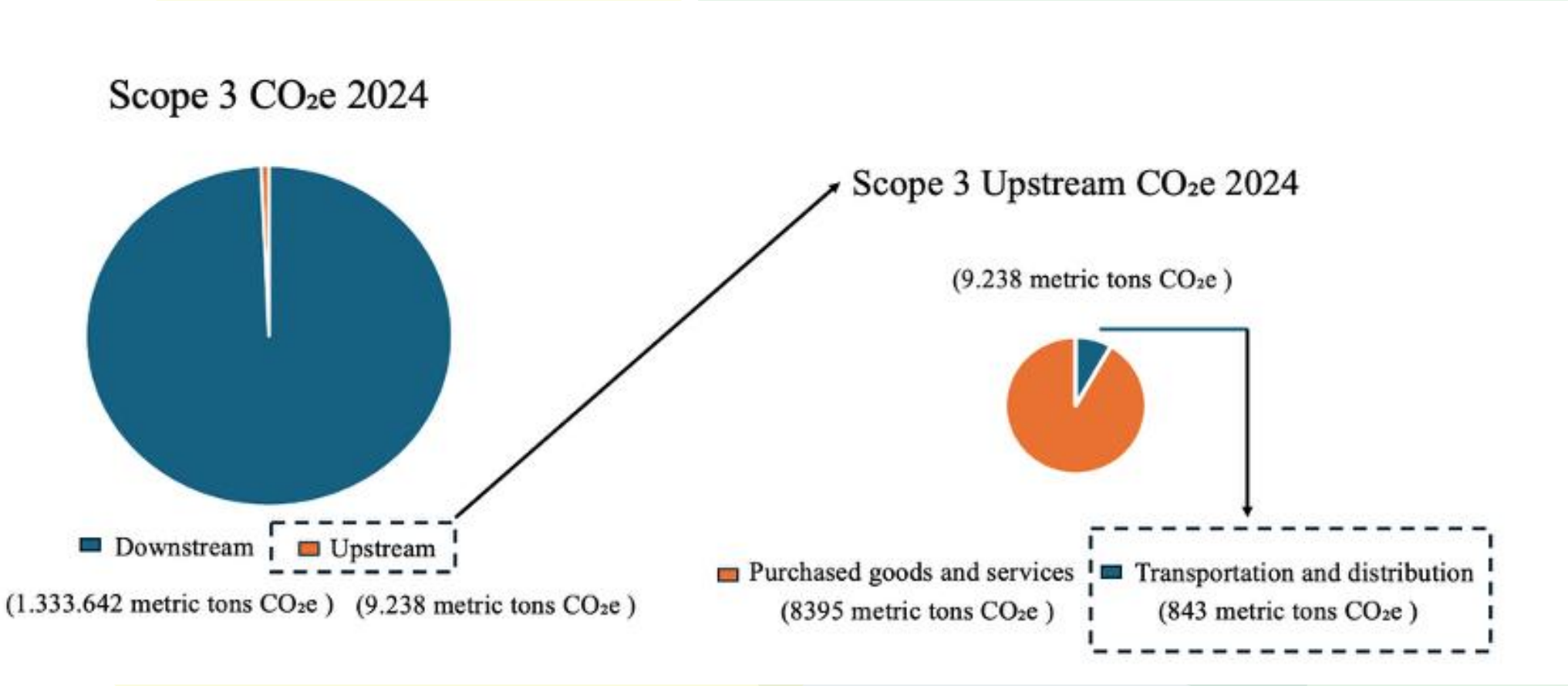
The Case
Scope 3 Emissions



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The Case

- **Initiative 1:** Collaborating with suppliers to define and achieve common climate targets

- **Initiative 2:** Reduce inbound transport emissions by 50% by 2030

- **AM** introduced for technical performance → indirect benefits for emissions.
  - Supply network reconfiguration
  - Fewer suppliers for certain components
  - New activities in the production process

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Analysis
Initiative 1 – Supplier Collaboration

Aim: Support suppliers in reducing CO_2 emissions → FMC's Scope 3 reduction

Approach

- Two phases: supplier selection & collaborative engagement
- Targeted capacity building and continuous dialogue

Challenge

- Standardising vs tailoring processes for different suppliers

Opportunity

- Industry transformation by helping suppliers with limited sustainability knowledge

Analysis
Initiative 2 – Reducing Inbound Transport Emissions

Aim: Reduce inbound transport emissions by 50% by 2030

Measures

- Shipment consolidation
- Modal shift (air → sea freight)
- Incoterm change (DAP → FCA)

Challenges

- Internal: identifying the right actors & aligning procurement and logistics
- External: Delays → financial impact & compliance and system constraints

Opportunity

- More visibility and control of transport activities

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Analysis
AM Impact on Supply Networks

AM triggers

- Supply base restructuring
- Vertical integration: more in-house production

Transport effects

- Eliminated some transport activities. Added new ones → mixed impact

Analysis
Key Takeaways

Complexity of multiple sourcing strategies complicates emission reduction.

Potential for modal shifts and better vehicle utilisation remains unexplored

Success depends on

- Strategic alignment of purchasing decisions
- Collaboration across internal and external networks

AM effects on transport emissions → requires activity-level analysis

Concluding Discussion
Challenges and Opportunities

Challenges

- Large supplier base and embeddedness of transport activities
- Trade-offs between lead time, costs and sustainability
- Organisational barriers
- Regulatory pressures (CSRD, ETS2)

Opportunities

- Nearshoring reduces transport distances
- Flexible lead times enable modal shifts and consolidation
- AM and Industry 4.0 technologies potentially simplify supply networks

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Concluding Discussion
Identifying the “Right” Measures

Operational improvements

- Sustainable transport solutions
- Lead times

Collaboration

- Partnerships
- Environmental criteria

Supply network reconfiguration

- Closer suppliers
- AM and digital technologies

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