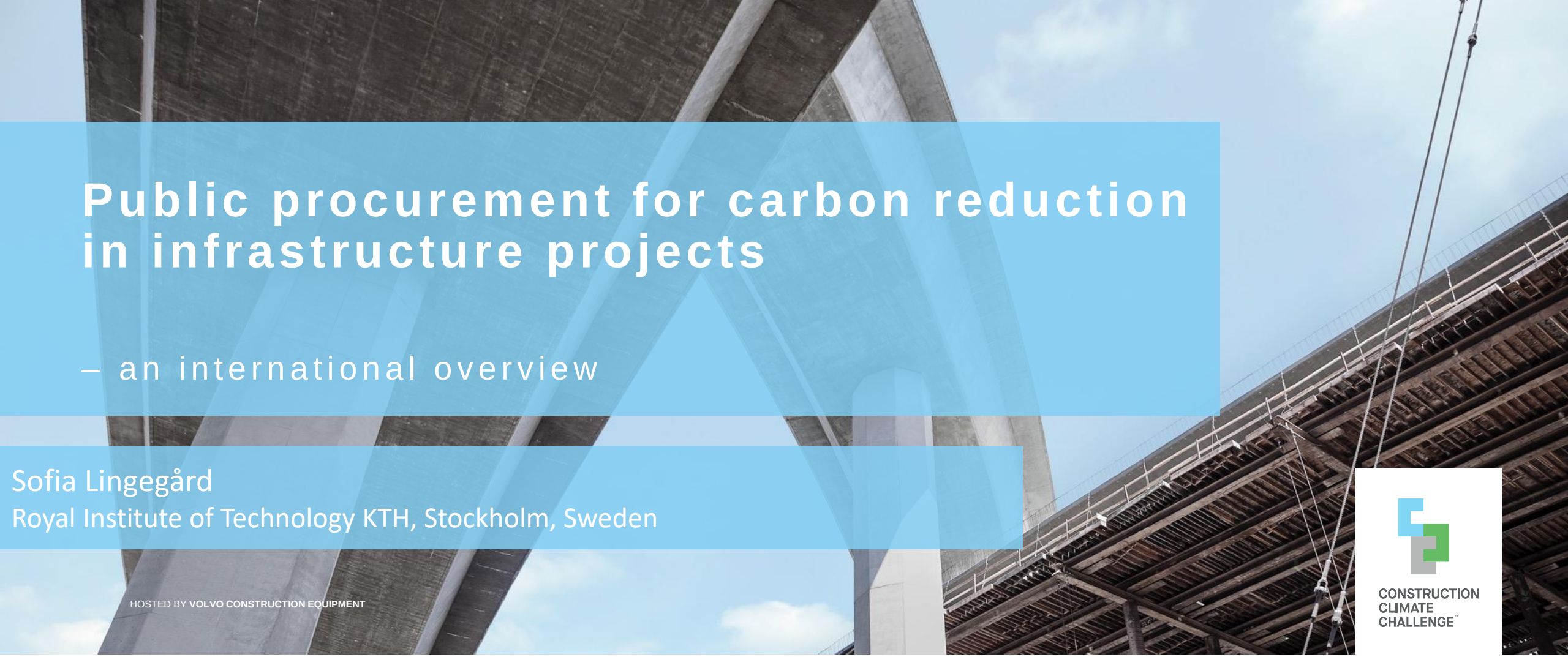

# Public procurement for carbon reduction in infrastructure projects

– an international overview

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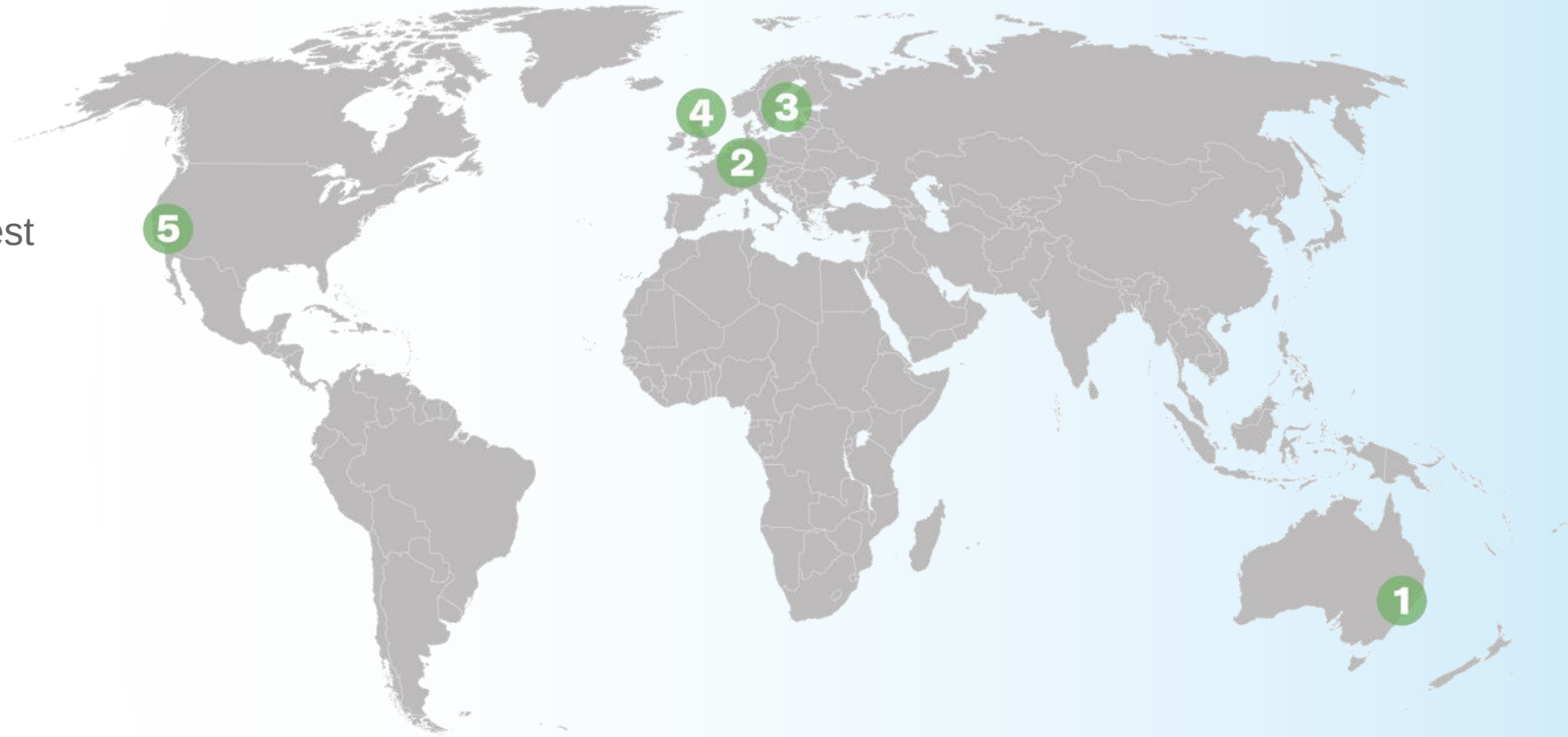
# About the research project

- Maps procurement requirements for carbon reduction in infrastructure construction projects worldwide, including policy background and implementation in supply chain
- Focuses on embodied carbon and not operational
- Interviews with clients, consultants, contractors and suppliers
- Mega-projects and large projects (plus one strategic alliance)

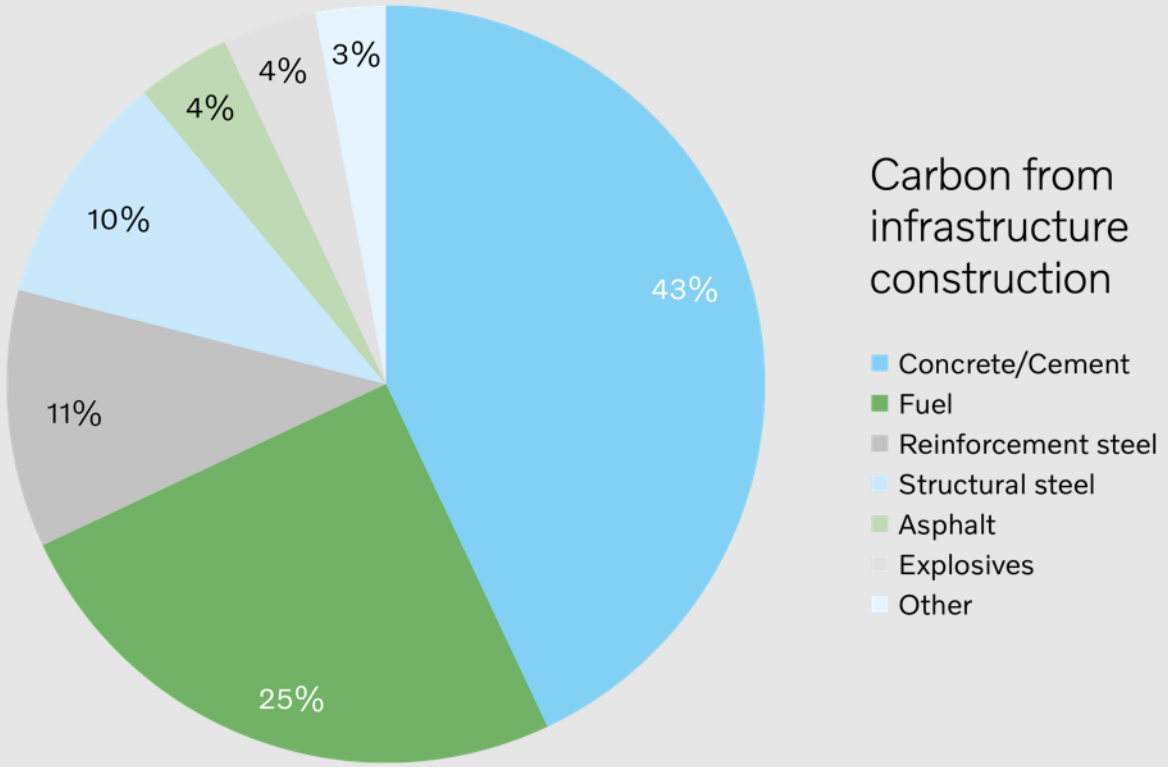
# Case Studies

1. **Australia**
   - Sydney Metro Northwest
   - Newcastle Light Rail
2. **The Netherlands**
   - Motorway A6 Almere
3. **Sweden**
   - Several STA projects
4. **UK**
   - High Speed 2
   - Anglian Water alliance
5. **USA**
   - California High-Speed Rail
   - SFO AirTrain Extension



# Background: Infrastructure Carbon Emissions

- Most CO2 reductions also save costs
- Changes needed in many design and construction processes
- Embodied carbon recent trend




Carbon footprint assessment of all major projects in the Swedish national plan for infrastructure investments for the period 2018–2029 Swedish Transport Administration STA (2018)

# Background:
# Innovation and learning in the construction industry

- Client requirements set incentives for innovation in the whole industry
- Large public clients stand for a high share of demand, especially in infrastructure
- Construction projects are unique and temporary – structured learning and development is difficult

# Types of requirements

- Selection and award criteria
- Technical specifications and other specific requirements
- Sustainability assessment schemes/Rating Schemes
- Carbon reduction requirements or incentives (“functional requirements”)

# Requirements in the cases – examples

| Type | Examples |
|---|---|
| **Selection and award criteria** | • Tender discount based on organizational capabilities (NL: CO2 ladder)<br>• Tender discount based on carbon footprint calculation/reduction (NL: DuboCalc, see also red. req)<br>• Organizational competence evaluated based on exemplar low carbon designs (UK: HS2) |
| **Technical specifications and other specific requirements** | • Requirements for competence, roles and processes<br>- carbon manager, etc.<br>- carbon management plans, carbon footprint calculations and documentation<br>- PAS 2080 compatible (UK)<br>• Carbon performance and documentation requirements:<br>- Carbon performance for selected products/material<br>- Renewable fuels/energy<br>- EPDs<br>• Technical requirements:<br>- Cement clinker replacement, recycled ballast<br>- Steel production req.<br>- LED lightning<br>- Asphalt |
| **Sustainability assessment schemes/Rating Schemes** | LEED, BREEAM, Green Star (buildings)<br>BREEAM, ISCA, CEEQUAL, Envision, TfNSW SDGs (Infra) |
| **Carbon reduction requirements** | Reduction in embodied or capital carbon in relation to baselines calculated for reference designs (AU, NL, SW, UK) or in relation to business as usual (US). |

# Requirements

**“Functional” carbon reduction requirements**

- Perceived to encourage innovation but challenging to use
- Uncertainty in defining the reference case & when to update baseline
- Limited time to involve sub-suppliers and material providers

**“Specific” requirements/specifications**

- Seen as conservative and obstacles to innovation but have advantages
  - Enable learning between projects
  - Specifying new technology that contractors would otherwise not use
  - Affects material suppliers directly – not dependent on complex project processes
  - Easier for inexperienced suppliers

# Requirements

**Award criteria – examples and experiences**

- Used to raise carbon awareness and competence of tenderers, not to discriminate
- Many goals/dimensions are important in a large project – cannot get high incentive power for one award criterion

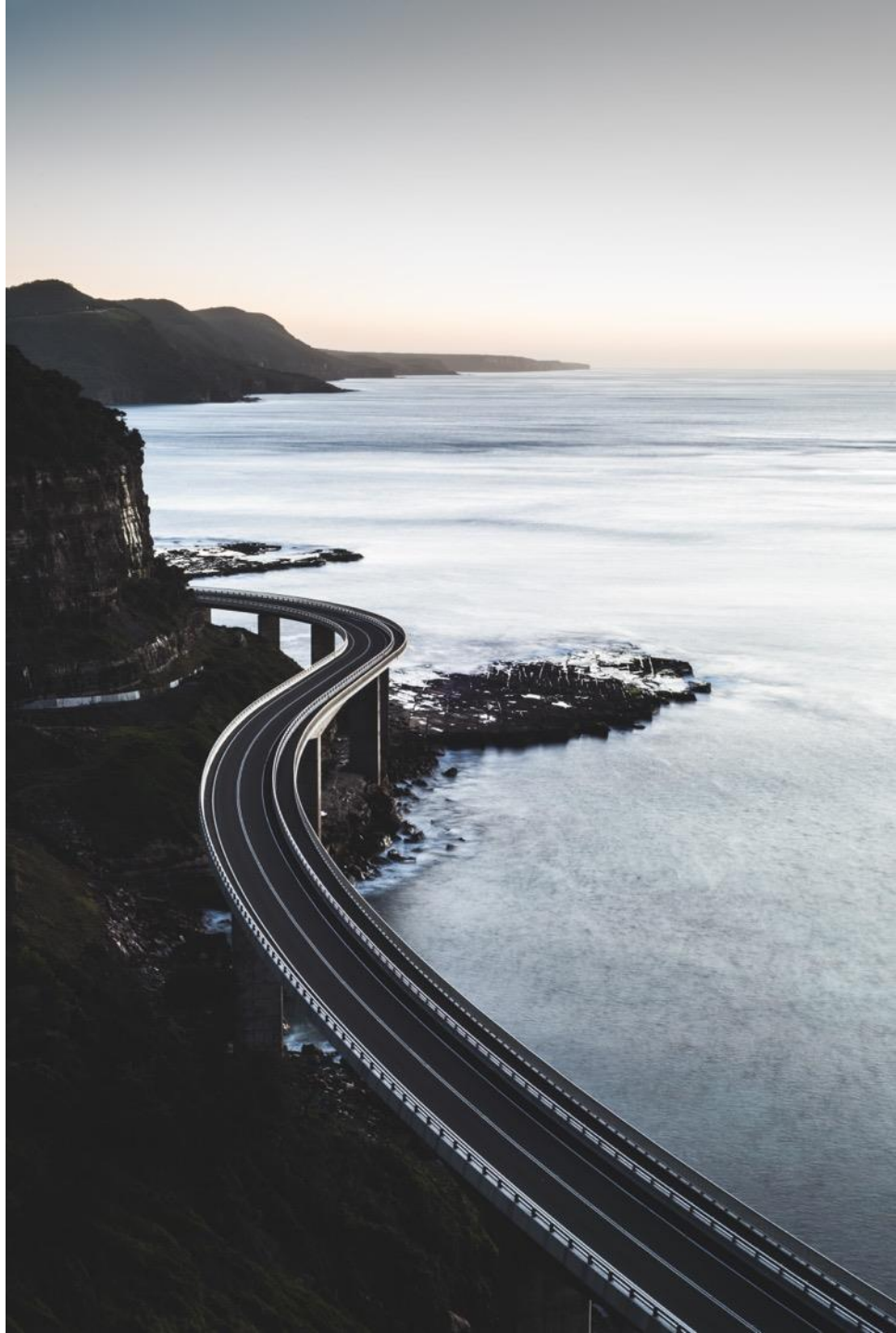
**Sustainability Assessment Schemes – examples and experiences**

- Used in countries with high carbon awareness and long experience: Australia and UK
- Do not drive cutting edge development, but provide predictability/standardization and supports broader dissemination
- Gaps when infra systems are less developed than those for buildings

# Learning processes and policy

- Fundamental differences in governance structure
  - Australia and US: state level with high power
  - Netherlands, UK, Sweden: power on the national level
- National policy or projects taken a role to push policy
  - Large projects (Anglian water, CHSR) push policy
  - Policy driven change (Netherlands, HS2, Sweden)

- Client champions and supplier front runners are important
- Learning processes where ambitions, political commitment and executive mandate raise over time
- National/regional carbon reduction polices do not drive cutting-edge development but allow clients to set goals
- Procurement requirements must match local industry competence



# Conclusions

- Procurement requirements must match competence and capacity development (client and suppliers)
- Mutual interaction needed btw client and suppliers
- Limited innovation and change potential in individual projects – long-term strategy needed
- Combinations of requirements preferable
- Higher CO2 reduction levels require:
  - general improvements in efficiency and innovation – client competence and leadership
  - breaking silo-thinking and integrated supply chains

# Thank You!

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