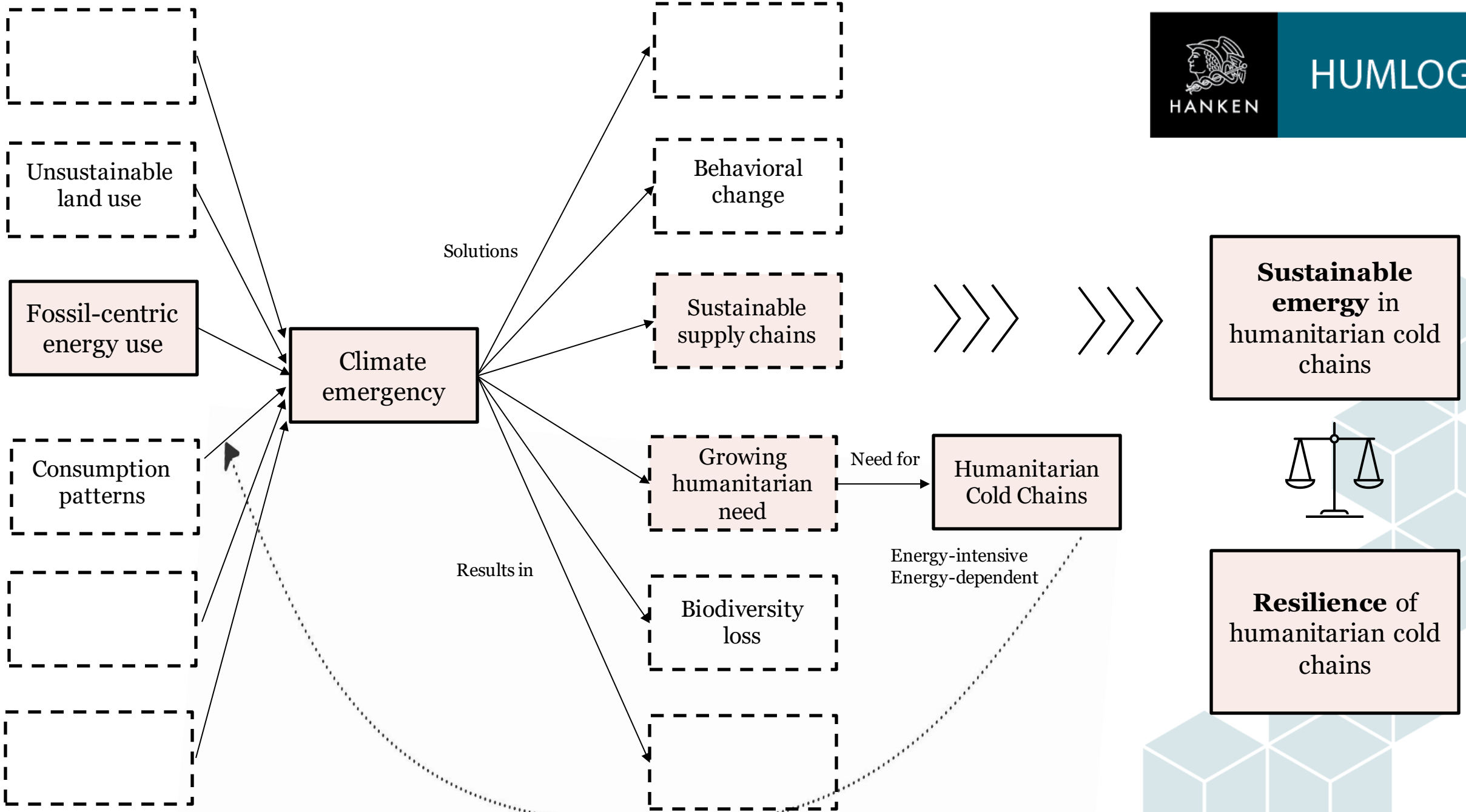
Sustainable Energy for a Humanitarian Medical Cold Chain

Sonja Saari, Doctoral Candidate, sonja.saari@hanken.fi
Diego Vega, Associate Professor, Director of the HUMLOG Institute, diego.vega@hanken.fi
Hanken School of Economics/HUMLOG Institute
30 November 2023

EQUIS ACCREDITED AACSB ACCREDITED ASSOCIATION OF MBAS ACCREDITED

The HUMLOG Institute

- Founded in **2008** jointly between Hanken School of Economics and the Finnish National Defence University
- **Not-for-profit organization; academic research only**
- Focus areas:
  - Supply Chain Management
  - Humanitarian Logistics
  - Sustainable Supply Chains
  - Disaster Preparedness
- **41 researchers**, professors, post-docs, PhD students, and administrators representing 23 nationalities
- Support Hanken's Supply Chain Management and Social Responsibility Master's and PhD programs



Energy for a humanitarian cold chain

HANKEN HUMLOG

”Humanitarian actions that save lives today carry *a carbon cost for future generations*”

WFP, 2016

”Today’s climate and environmental crises threaten the *survival of humanity”*

Climate Charter, 2023

“The question is whether energy is being used wastefully, and whether the same or higher demand for energy services can be met *with lower costs and lower environmental impact”*

Grafham and Lahn, 2018, pp. 11

Energy for a humanitarian cold chain

HANKEN HUMLOG

- Climate emergency's impacts on the humanitarian medical cold chain energy needs:
  - More extreme weather and climate conditions → more humanitarian needs → more cold chains needed
  - Energy crisis → access to energy, where and how to get it, how much does it cost
  - Spread of diseases → health of people, ensure access to vaccines

- Energy is included everywhere
- The choice of energy for a humanitarian cold chain has positive or negative short- and long-term impacts

Energy for a humanitarian cold chain

HANKEN HUMLOG

- What is sustainable energy for a humanitarian medical cold chain?
  - End-to-end approach using sustainable thinking, including:
    - **Technological sustainability** (the use of renewables, vaccine innovations)
    - **Financial sustainability** (long-term planning and structures)
    - **Environmental sustainability** (reducing emissions, ensuring biodiversity)
    - **Societal sustainability** (improving livelihood, health, education)

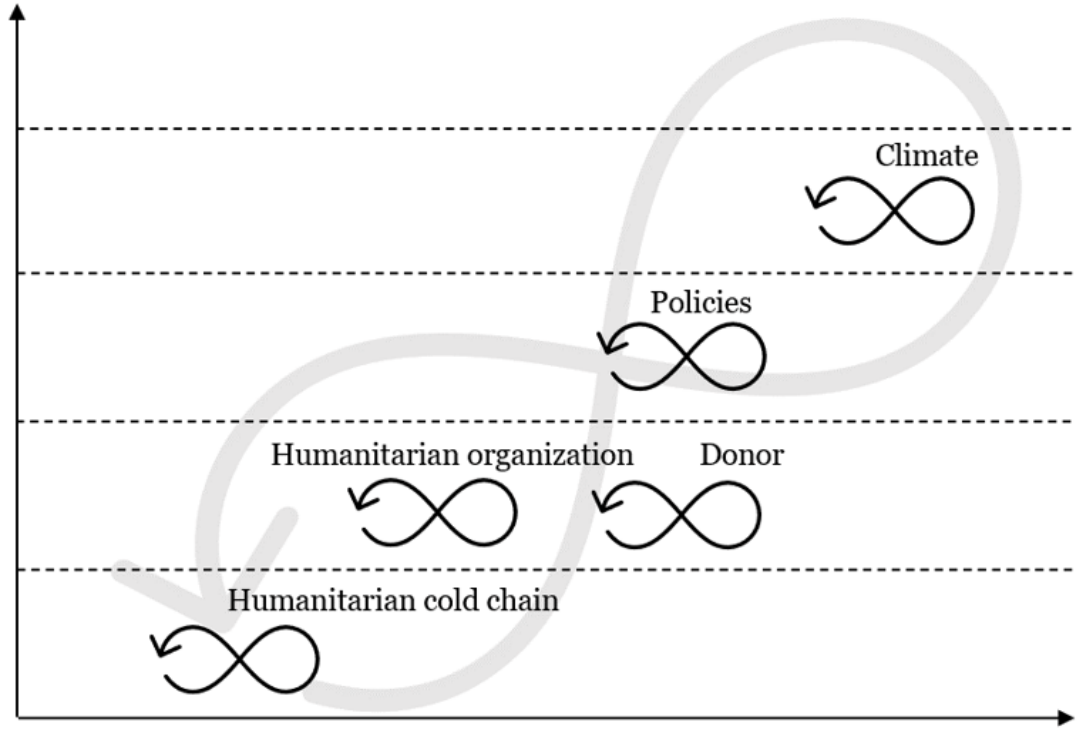
Comes *et al.* (2018); Al-Kaddo and Rosenberg-Jansen (2021); Besiou *et al.* (2021)

HUMLOG Institute's research

- The existing trade-off between ensuring stability and continuity (*keep it cold*) and making provision for sustainable energy programming (*make it greener*) continues to dominate the academic and practical discussion:

1. Sustainability in the humanitarian context is perceived as an additional, external, and instrumental concept (Montabon *et al.*, 2016; Besiu *et al.*, 2022);
2. The importance of energy as an overarching sector that determines the health of aid recipients is not emphasised in the humanitarian sector (Thomas *et al.*, 2021); and
3. The dominant paradigm of programming sustainable energy into a humanitarian medical cold chain adheres to a limited, robust, static, controllable and linear approach (Thomas *et al.*, 2021), making the adaptable transition more challenging (Wieland, 2021).

HUMLOG Institute's research

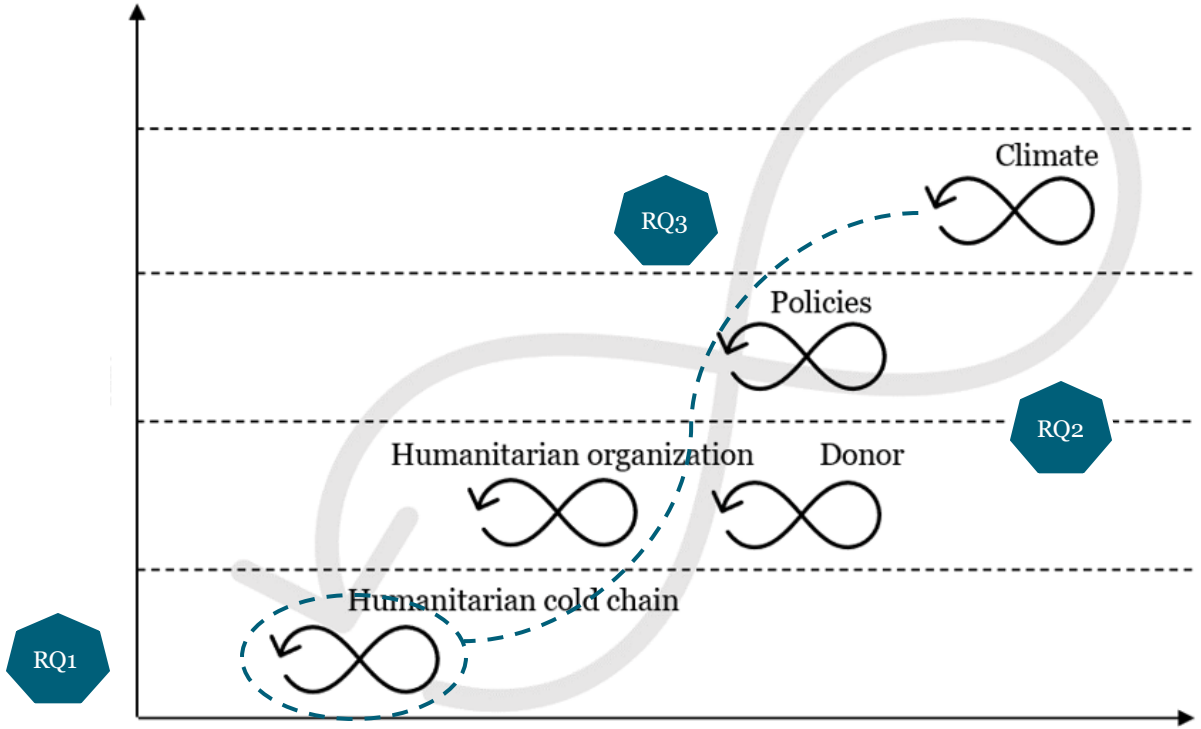


Adapted from Holling, 2001; Wieland, 2021

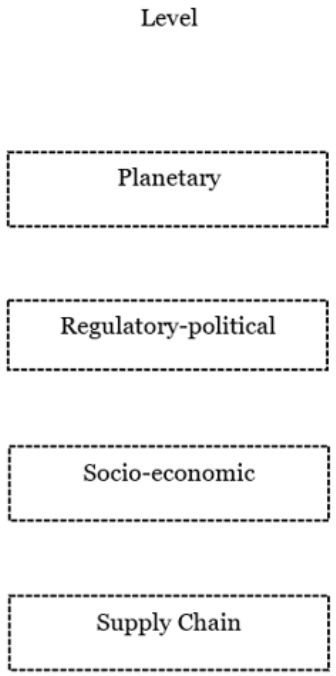
Level	Example of an outlier factor
Planetary	Climate change Covid-19
Regulatory-political	Earth Summit in Rio de Janeiro, 1992 Paris Agreement, 2015
Socio-economic	Climate and Environment Charter, 2020 HO guidelines and policies Internal sustainability meaning
Supply Chain	Emerging technologies Context

Saari et al., 2023

HUMLOG Institute's research



Adapted from Holling, 2001; Wieland, 2021



RQ1 Opportunities for and barriers to increasing the use of renewable energy sources in an emergency humanitarian medical cold chain.

» Saari, 2023

RQ2 What socio-political conditions for sustainable energy influence the humanitarian medical cold chain's adaptability for energy transition?

RQ3 How do the supporting conditions govern the legitimacy of programming sustainable energy in a humanitarian medical cold chain?

HUMLOG Institute's research

RQ1

- Identified 2 energy-consuming sections where renewable energy most feasibly could replace diesel generators
  - National warehouses and local health facilities

Opportunities	Barriers
Short- and long-term environmental sustainability	Mindset and lack of knowledge
Long-term economic benefits	Environmental criteria not part of performance measurements
Increased environmental awareness	Lack of resources
Environmental friendliness	Lack of proof of practicality and reliability
More efficient and resilient emergency HMCCs	Lack of local capacities and competences
Local market development	Lack of funding mechanisms
Entry point to local communities' sustainable reconstruction	Lack of pressure from stakeholders
Responsibility	Lack of technological knowledge
	Lack of private sector involvement
	Volatility of disaster settings

Saari, 2023, pp. 166

HUMLOG Institute's research

RQ1

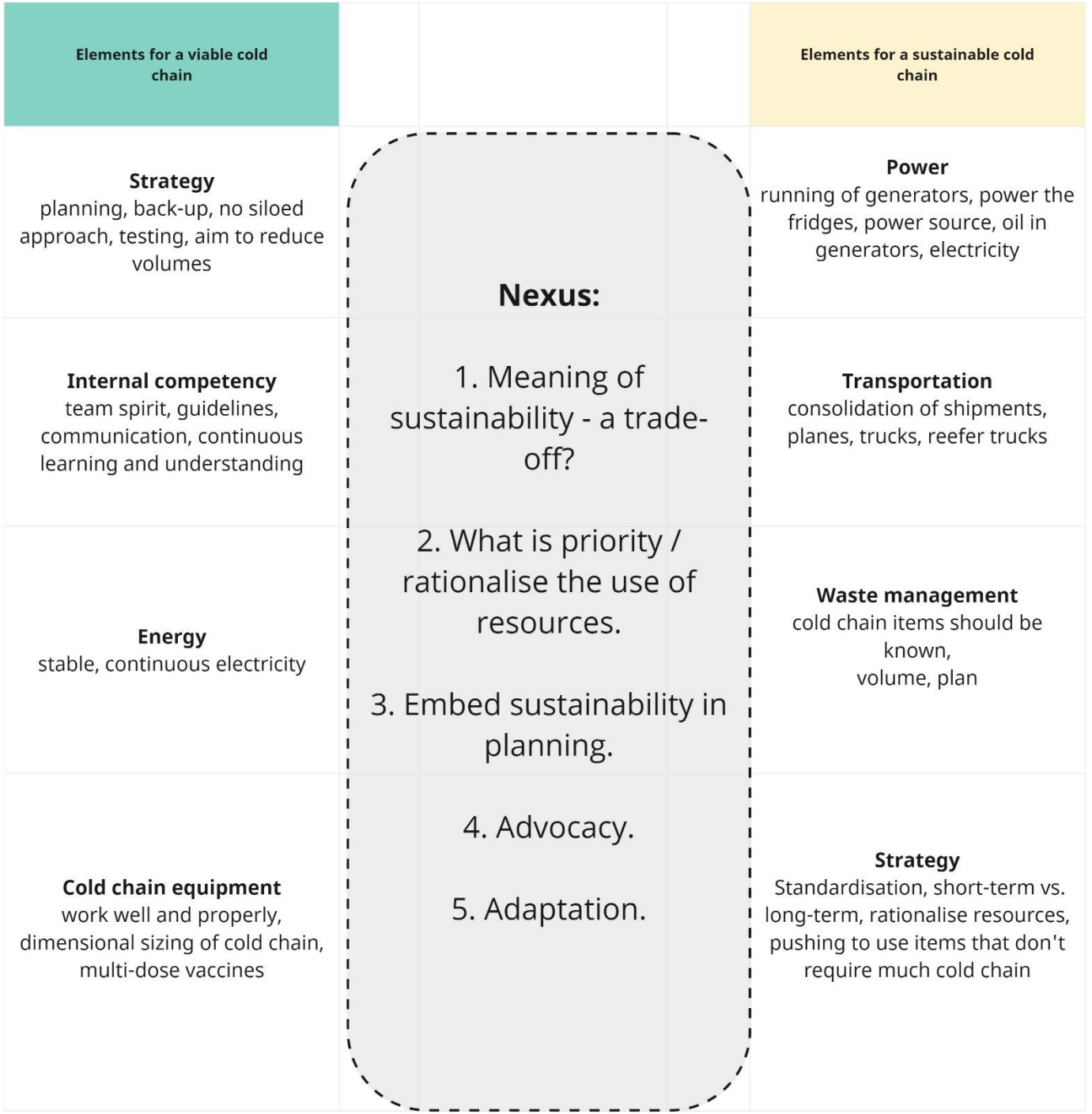
- 4 propositions:
  - P1: To ensure the reliability and applicability of RES in emergency HMCCs, HOs must adopt a holistic view of RES to include resources, awareness, infrastructure and prerequisites.
  - P2: A comprehensive use of RES in emergency HMCCs, including not only equipment but also facilities, can increase the environmental sustainability of the operation in total.
  - P3: Redesigning emergency HMCCs with more RESs helps in rebuilding the affected community in a climate-resilient manner, benefitting other mandates as well.
  - P4: In emergency HMCC, a hybrid model combining fossil fuel and RES is most advantageous to ensure energy security while continuously aiming to increase the provision of RES used.

Saari, 2023, pp. 167-168.

HUMLOG Institute's research

RQ2 RQ3

- Case study with MSF OCG
- 3 case scenarios in different countries to understand the transition to sustainable energy use in a humanitarian medical cold chain
- Preliminary results from case 1:



Thank you!

The HUMLOG Institute is on a continuous lookout for collaboration with researchers and practitioners interested in the area of humanitarian logistics and supply chain management, we work better together!

Join our community!

General Inquiries: *humlog@hanken.fi*
Follow us on Linkedin and Twitter!

The HUMLOG Institute
P.O. Box 479
(Arkadiankatu 22)
FI-00101 Helsinki
Finland