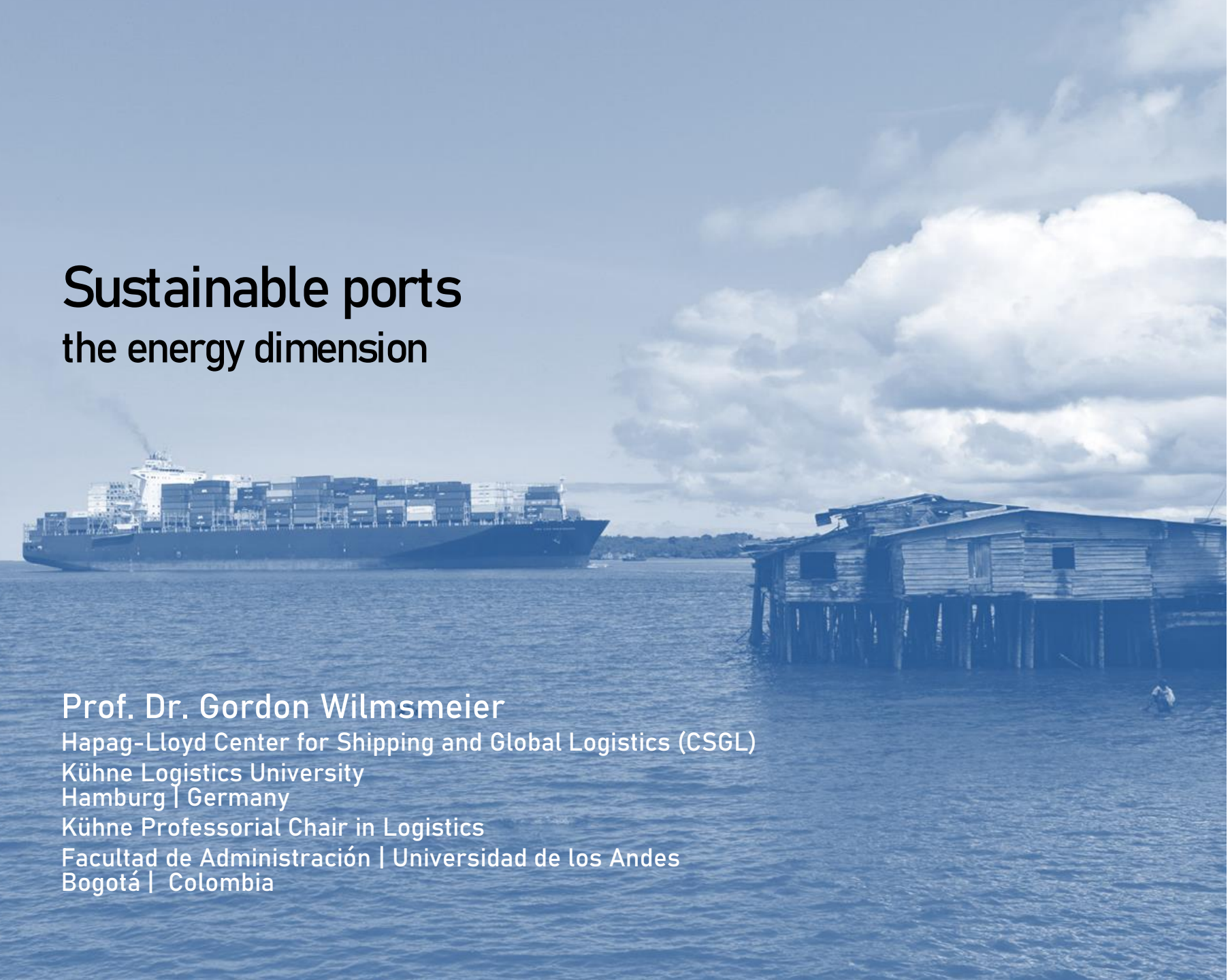

# Sustainable ports

## the energy dimension


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Global Supply Chain Forum
Barbados
21–24 May 2024


Why are we here?
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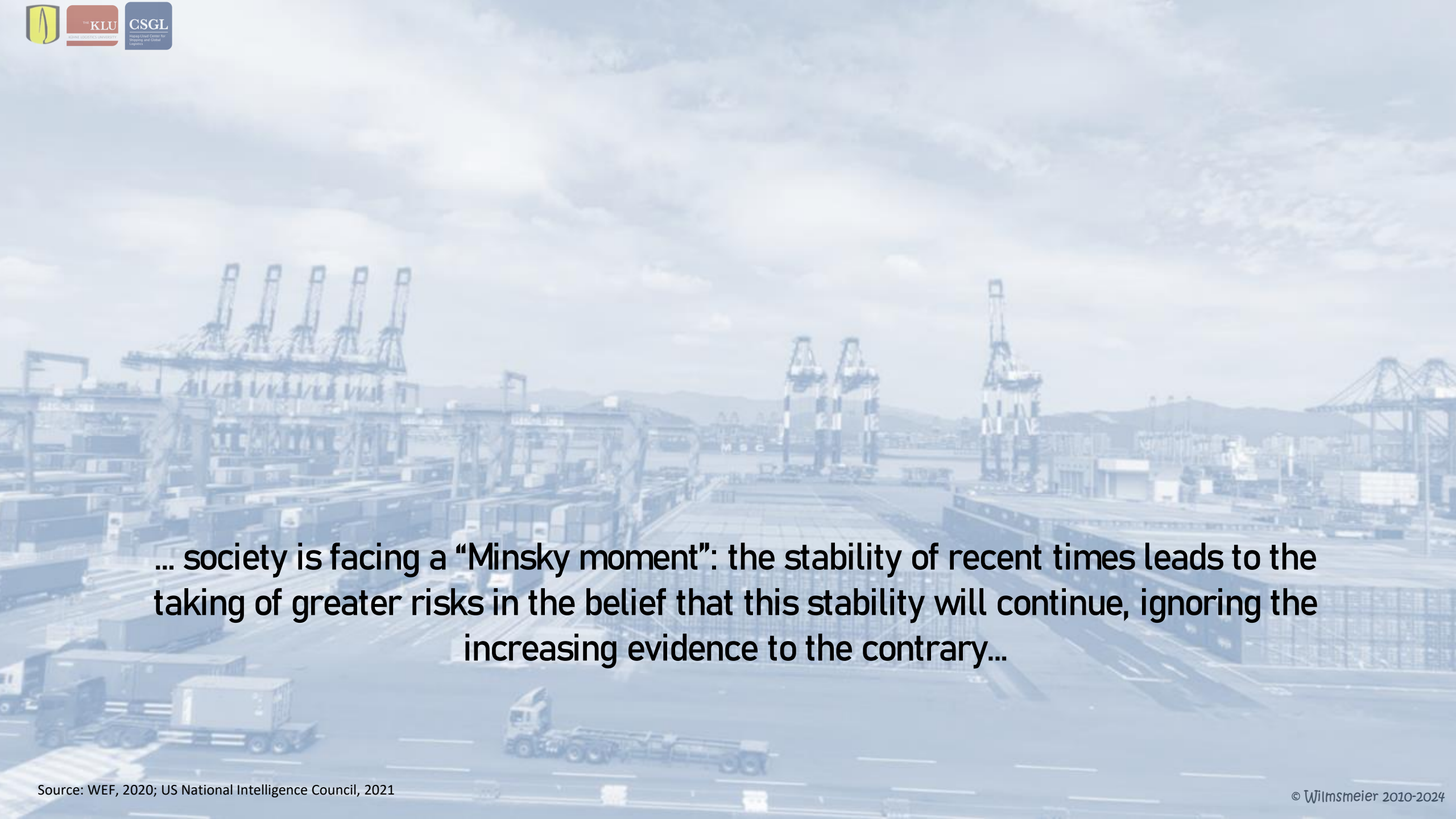
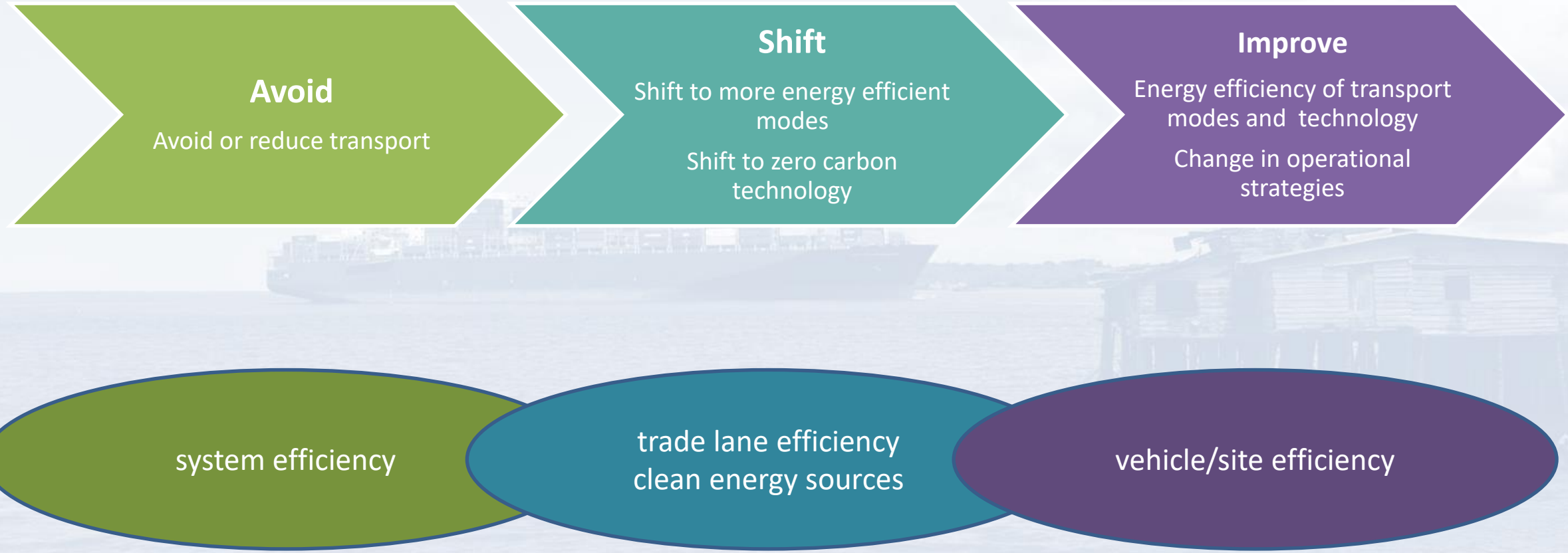


... society is facing a “Minsky moment”: the stability of recent times leads to the taking of greater risks in the belief that this stability will continue, ignoring the increasing evidence to the contrary...

Source: WEF, 2020; US National Intelligence Council, 2021

# Why should we calculate energy consumption & emissions in ports?

# The A-S-I concept



# Ports role in decarbonisation

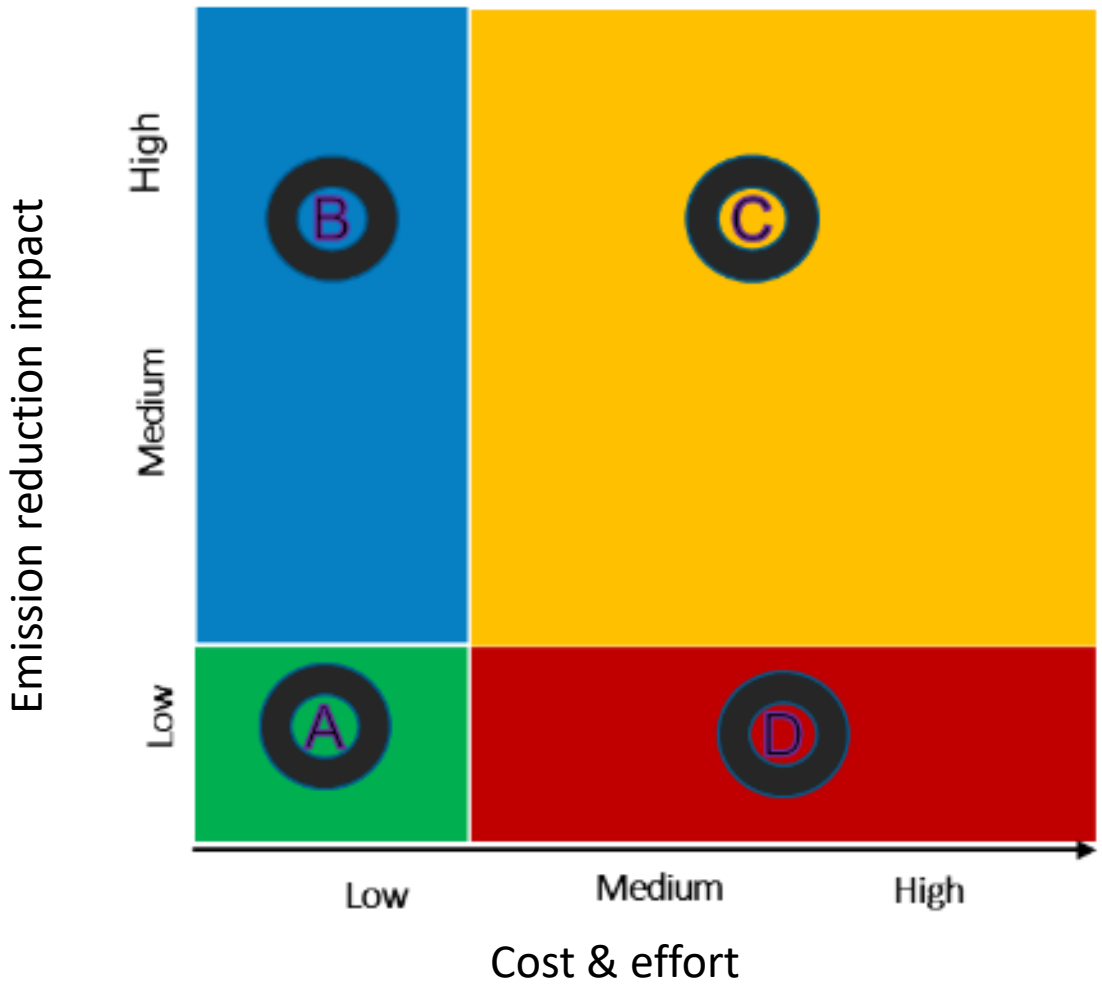
Decarbonising of port operations

Facilitating the decarbonisation of the shipping industry by:

providing the necessary storage and supply infrastructure to provide green bunkering fuel & electricity (cold ironing)

Facilitating the transition of national energy systems by importing, exporting, or storing green energy sources, and/or having energy industry clusters in the vicinity of ports

# Effort matrix and time to impact of mitigation measures in ports




| Measure | Matrix cat. | Time to impact |
|---|---|---|
| MMGS: Measure, monitor and goals setting | B | S |
| ECO: Eco-driving | B | S |
| FM: Fleet management | A | S |
| PGPD: Pric | | S |
| LEE: Low | | S |
| SS: Slow s | | S |
| STD: pr standards | | S |
| TTTEE: (electric) | | M |
| AG: Auto | | M |
| OM: C term | | M |
| Gr | | |
| PSM: awarene | | M |
| RPDFF: R terminals | | M |
| CI: Onsho | | M |
| TTTEH: (hydroge | | L |
| TTT: Tech | | L |
| TTBT: Tec | | L |
| DP: Dry Ports | C | L |
| MS: Modal Split | C | L |
| PE: Produce electricity | D | L |
| PAF: Provide / procure alternative fuels for port users | C | L |

A: Quick wins

B: Priority projects

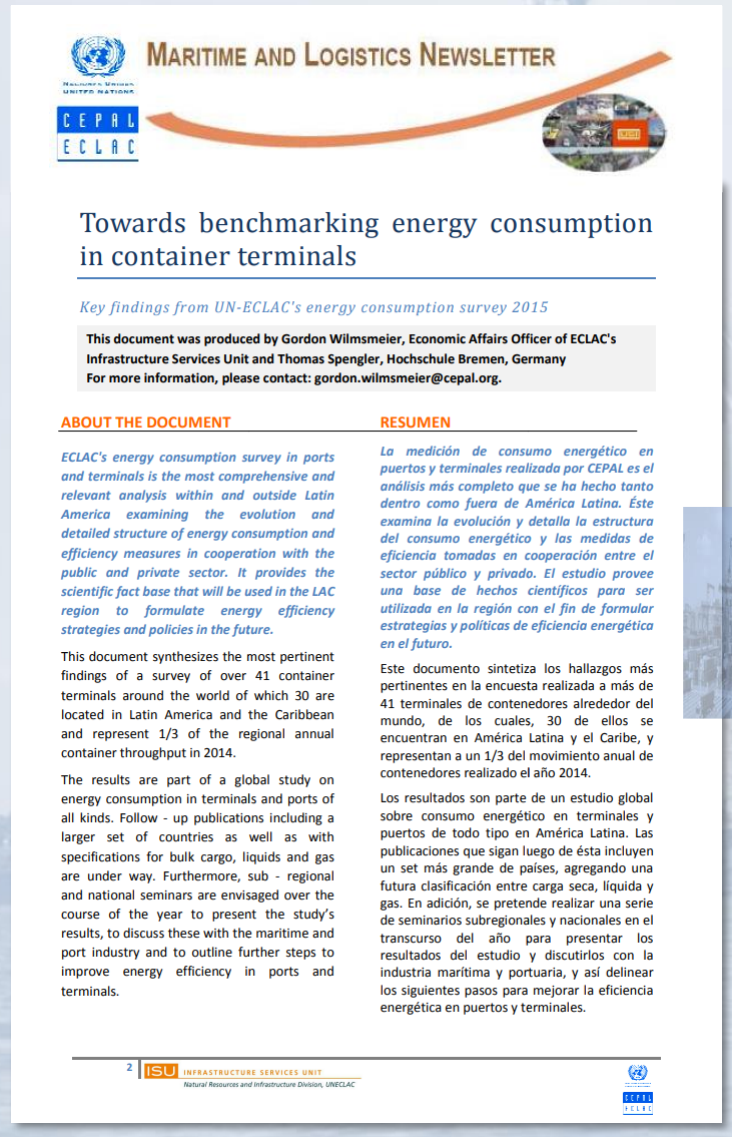
C: High-cost projects

D: Hidden traps

Source: Wilmsmeier et al. (2024-forthcoming). Port Reform Toolkit. The World Bank. Washington D.C.

# Available standards and initiatives

# Reference Standards



MARITIME AND LOGISTICS NEWSLETTER

CEPAL ECLAC

## Towards benchmarking energy consumption in container terminals

*Key findings from UN-ECLAC's energy consumption survey 2015*

**This document was produced by Gordon Wilmsmeier, Economic Affairs Officer of ECLAC's Infrastructure Services Unit and Thomas Spengler, Hochschule Bremen, Germany**
**For more information, please contact: gordon.wilmsmeier@cepal.org.**

### ABOUT THE DOCUMENT

*ECLAC's energy consumption survey in ports and terminals is the most comprehensive and relevant analysis within and outside Latin America examining the evolution and detailed structure of energy consumption and efficiency measures in cooperation with the public and private sector. It provides the scientific fact base that will be used in the LAC region to formulate energy efficiency strategies and policies in the future.*

This document synthesizes the most pertinent findings of a survey of over 41 container terminals around the world of which 30 are located in Latin America and the Caribbean and represent 1/3 of the regional annual container throughput in 2014.

The results are part of a global study on energy consumption in terminals and ports of all kinds. Follow - up publications including a larger set of countries as well as with specifications for bulk cargo, liquids and gas are under way. Furthermore, sub - regional and national seminars are envisaged over the course of the year to present the study's results, to discuss these with the maritime and port industry and to outline further steps to improve energy efficiency in ports and terminals.

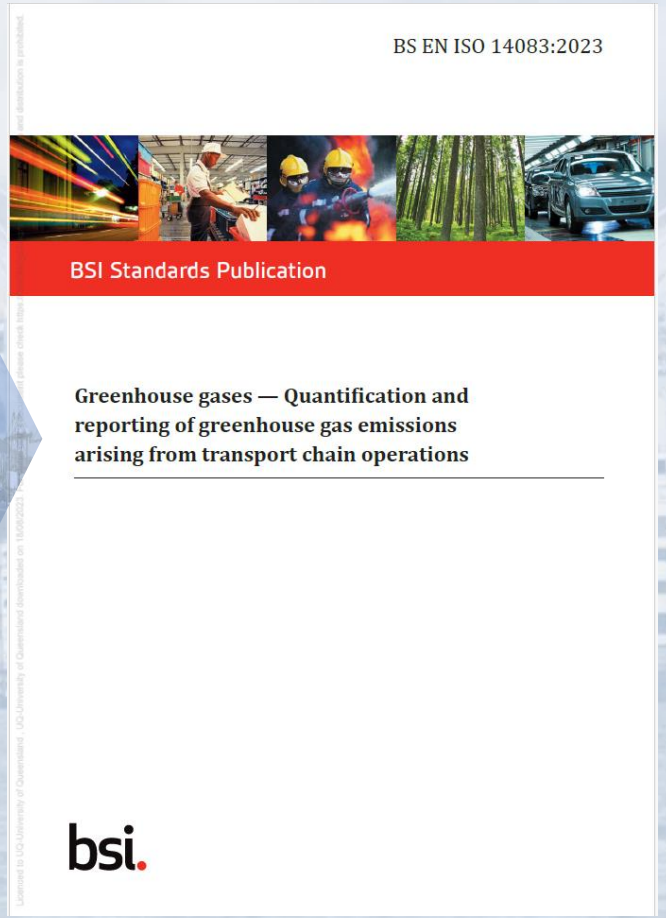
### RESUMEN

*La medición de consumo energético en puertos y terminales realizada por CEPAL es el análisis más completo que se ha hecho tanto dentro como fuera de América Latina. Éste examina la evolución y detalla la estructura del consumo energético y las medidas de eficiencia tomadas en cooperación entre el sector público y privado. El estudio provee una base de hechos científicos para ser utilizada en la región con el fin de formular estrategias y políticas de eficiencia energética en el futuro.*

Este documento sintetiza los hallazgos más pertinentes en la encuesta realizada a más de 41 terminales de contenedores alrededor del mundo, de los cuales, 30 de ellos se encuentran en América Latina y el Caribe, y representan a un 1/3 del movimiento anual de contenedores realizado el año 2014.

Los resultados son parte de un estudio global sobre consumo energético en terminales y puertos de todo tipo en América Latina. Las publicaciones que sigan luego de ésta incluyen un set más grande de países, agregando una futura clasificación entre carga seca, líquida y gas. En adición, se pretende realizar una serie de seminarios subregionales y nacionales en el transcurso del año para presentar los resultados del estudio y discutirlos con la industria marítima y portuaria, y así delinear los siguientes pasos para mejorar la eficiencia energética en puertos y terminales.



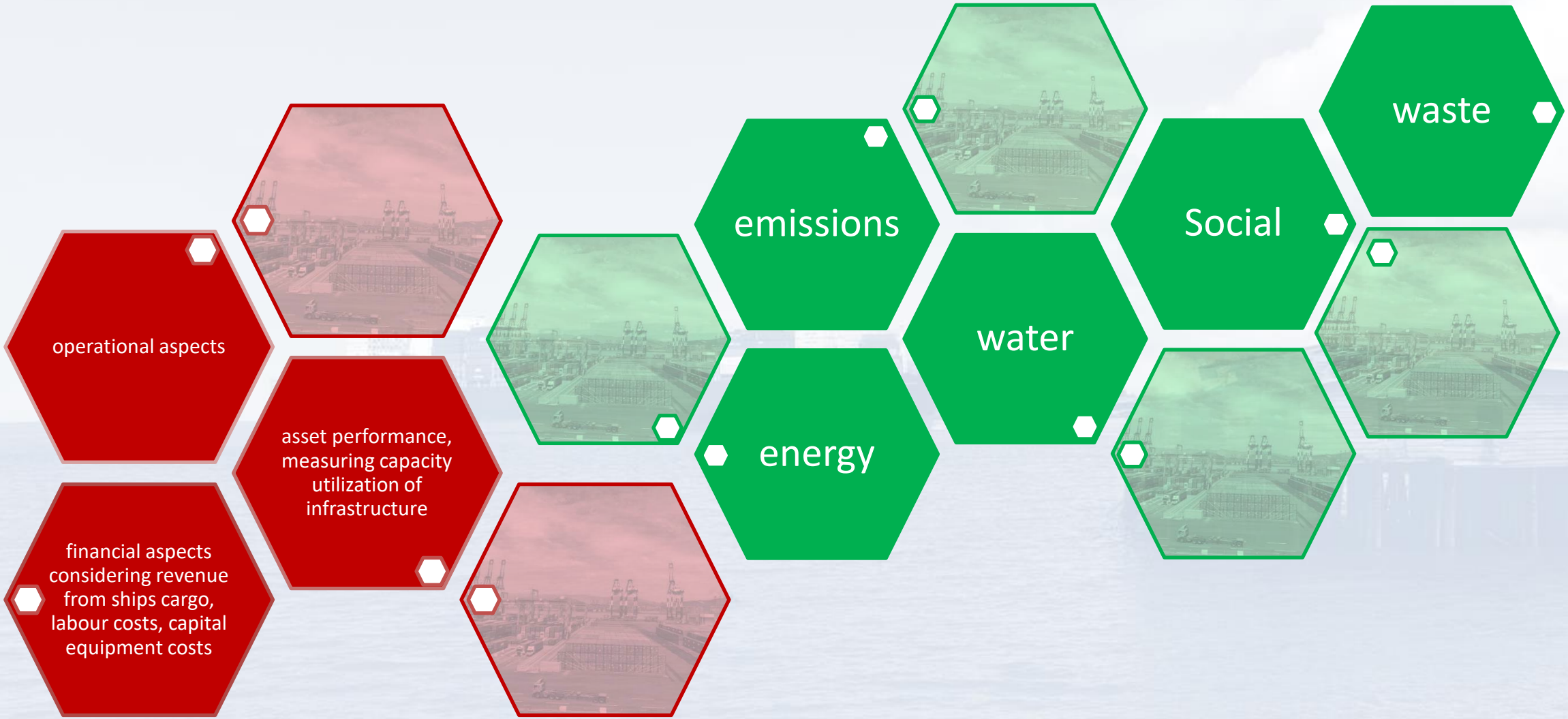
BS EN ISO 14083:2023

BSI Standards Publication

**Greenhouse gases — Quantification and reporting of greenhouse gas emissions arising from transport chain operations**

bsi.

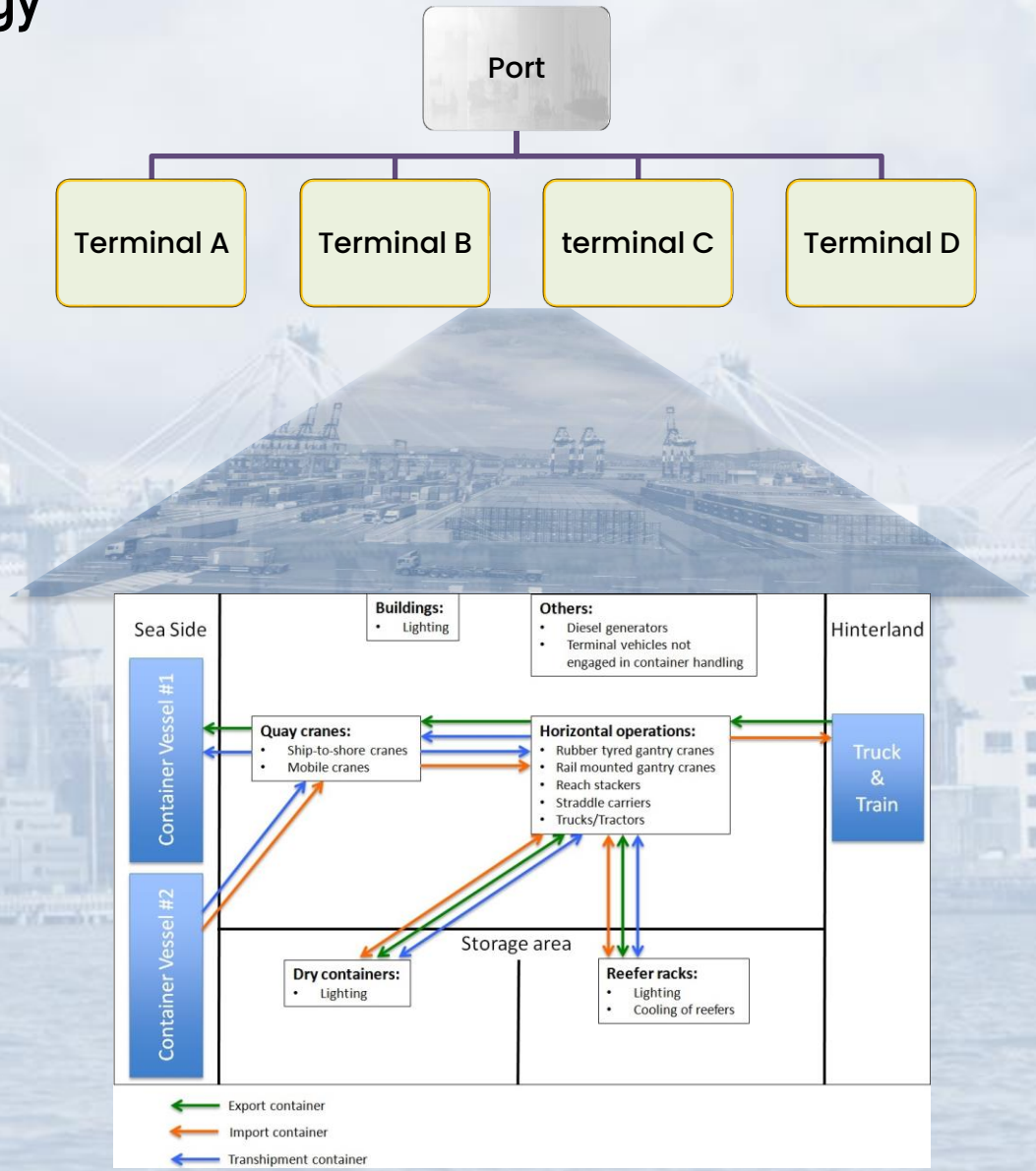
# Measuring port performance



# Methodology

Energy measurement methodology for the country's port terminals, based on the consumption approach by activity group.
A questionnaire was designed to collect information to calculate electricity and fuel consumption.
Information was requested from:

- Electricity consumption and expenses.
- Water consumption and expenditure.
- Fossil fuel consumption and costs.
- Waste production.



# Visualizing – energy consumption & emissions

## Collaborators

conecta logística

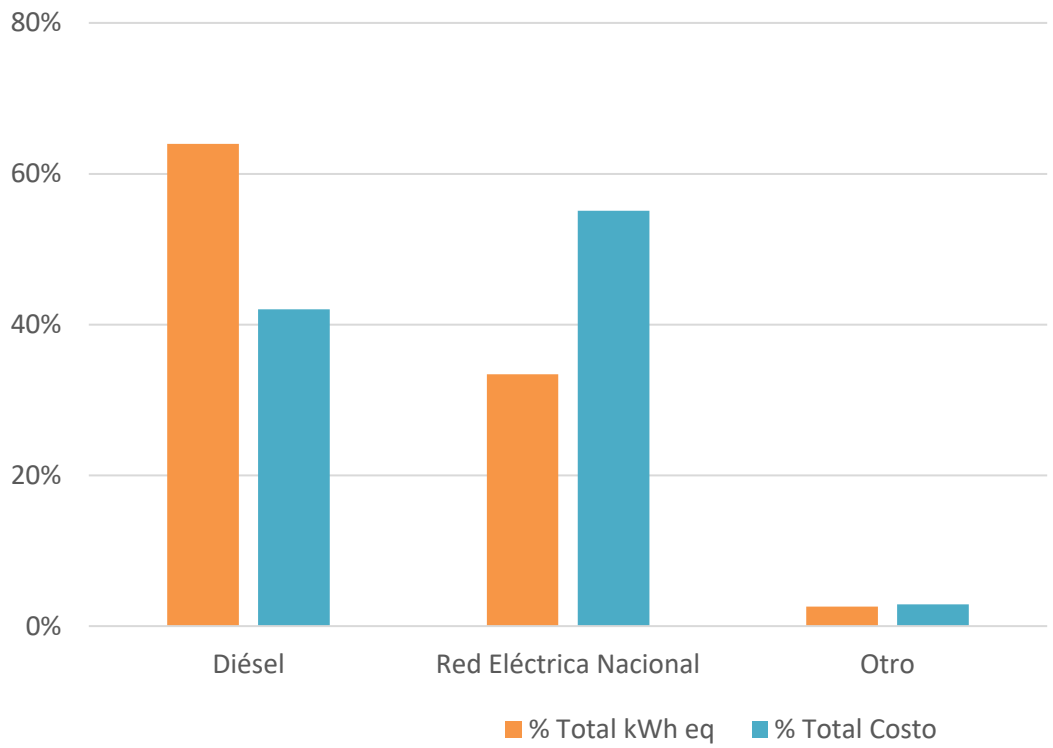
Ministerio de Transportes y Telecomunicaciones

Gobierno de Chile

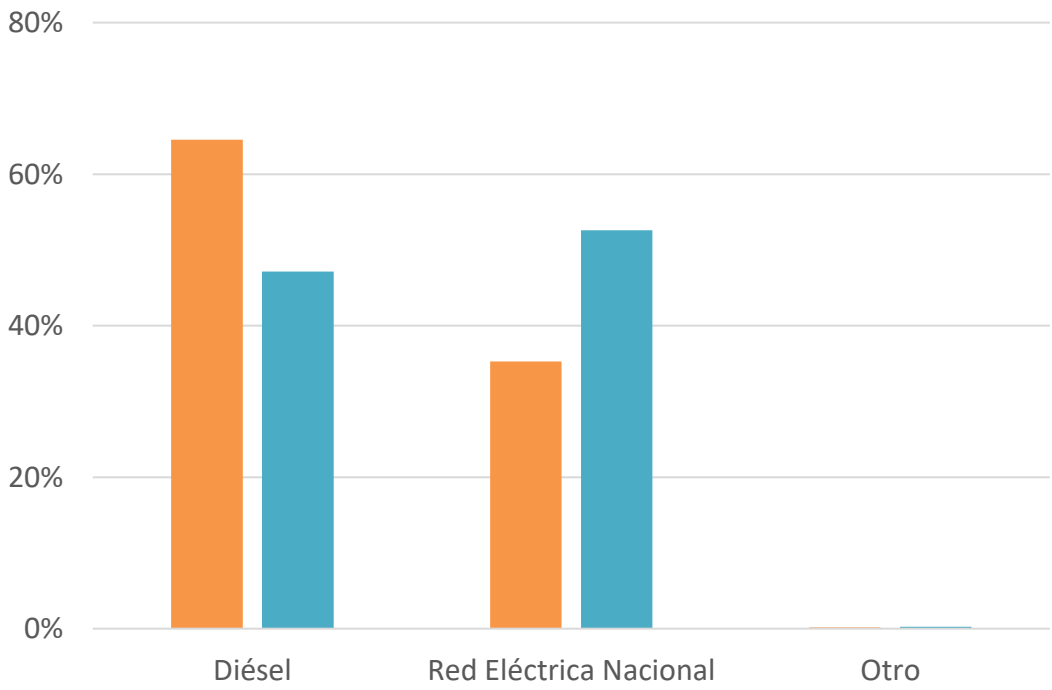
MINTRANSPORTE

# Energy consumption in container terminals by source and cost

## Chile



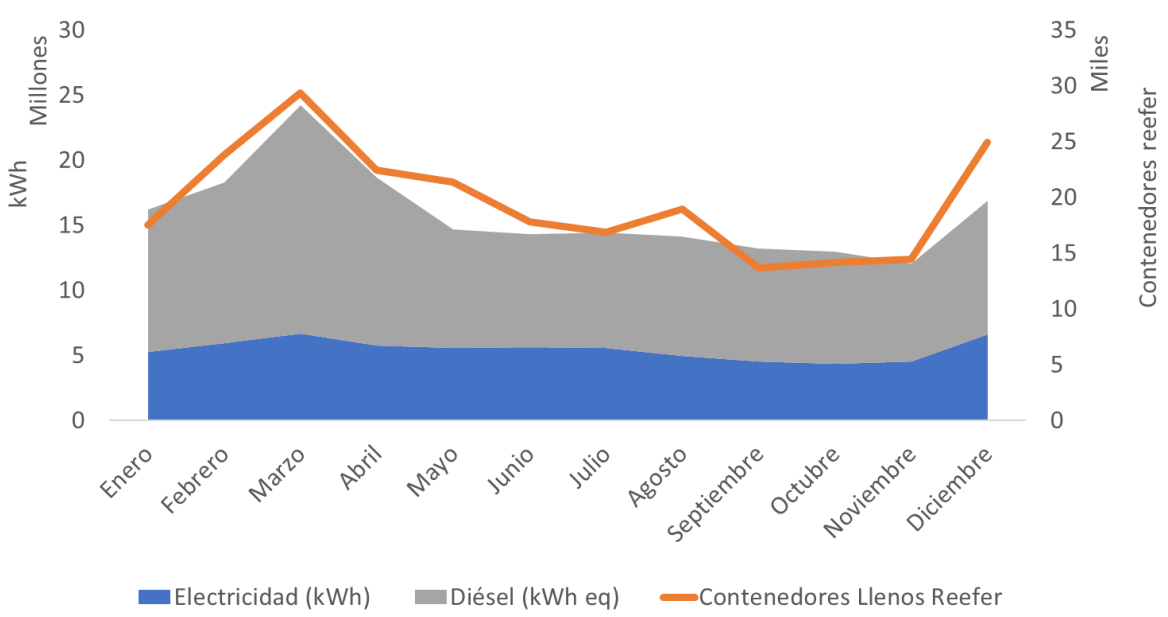

## Colombia



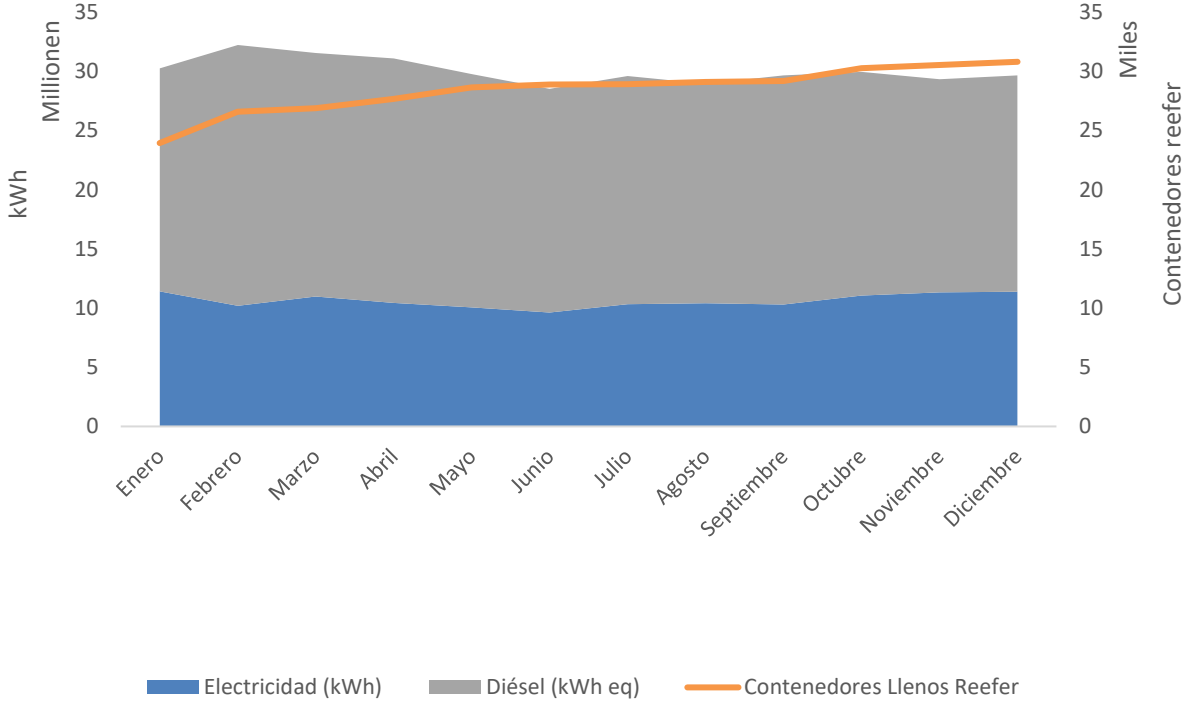

Source: Authors

# Energy consumption and reefer container movements per month, 2020

## Chile



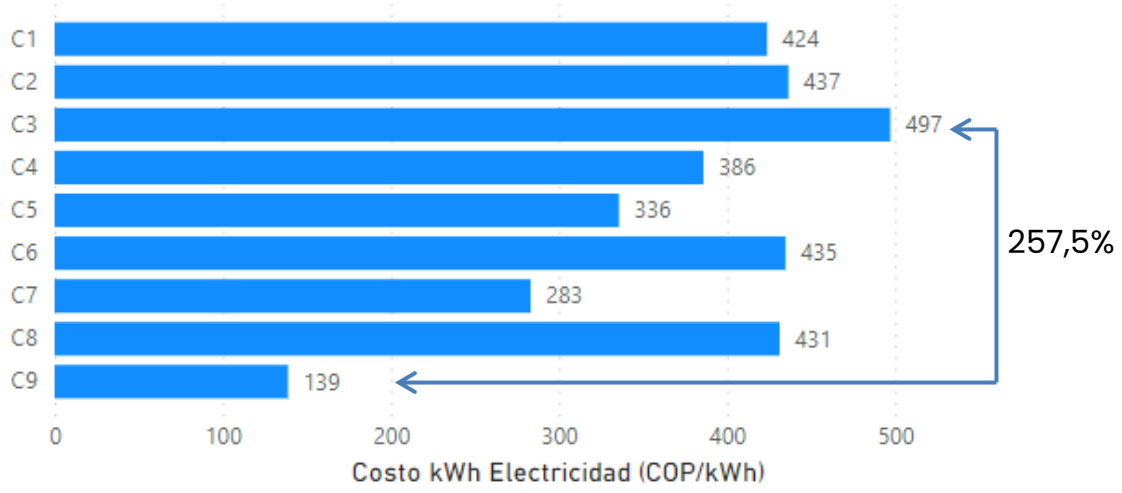

## Colombia



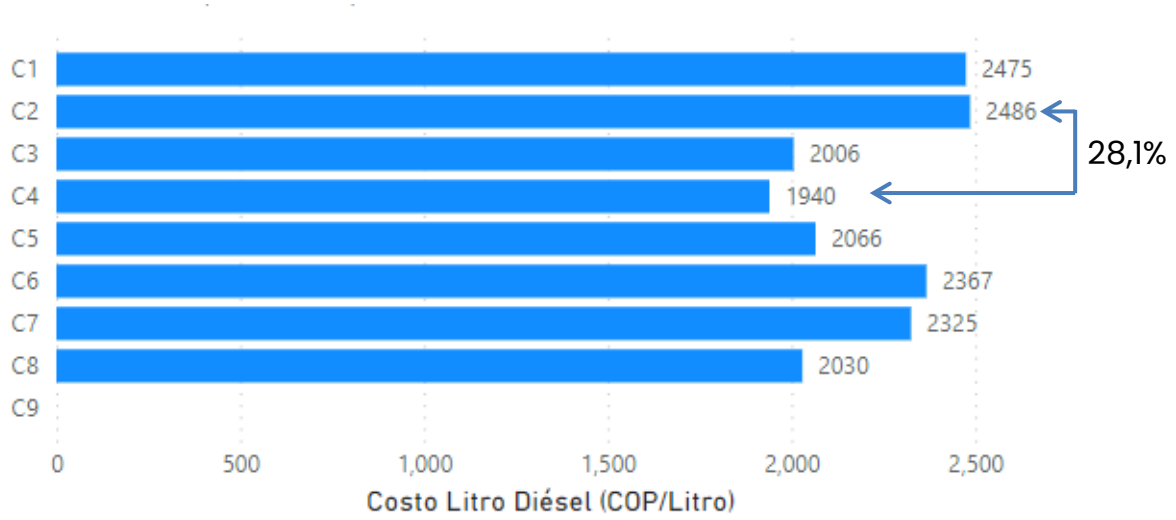

Source: Authors

# Energy costs per terminal, Colombia

## Electricity

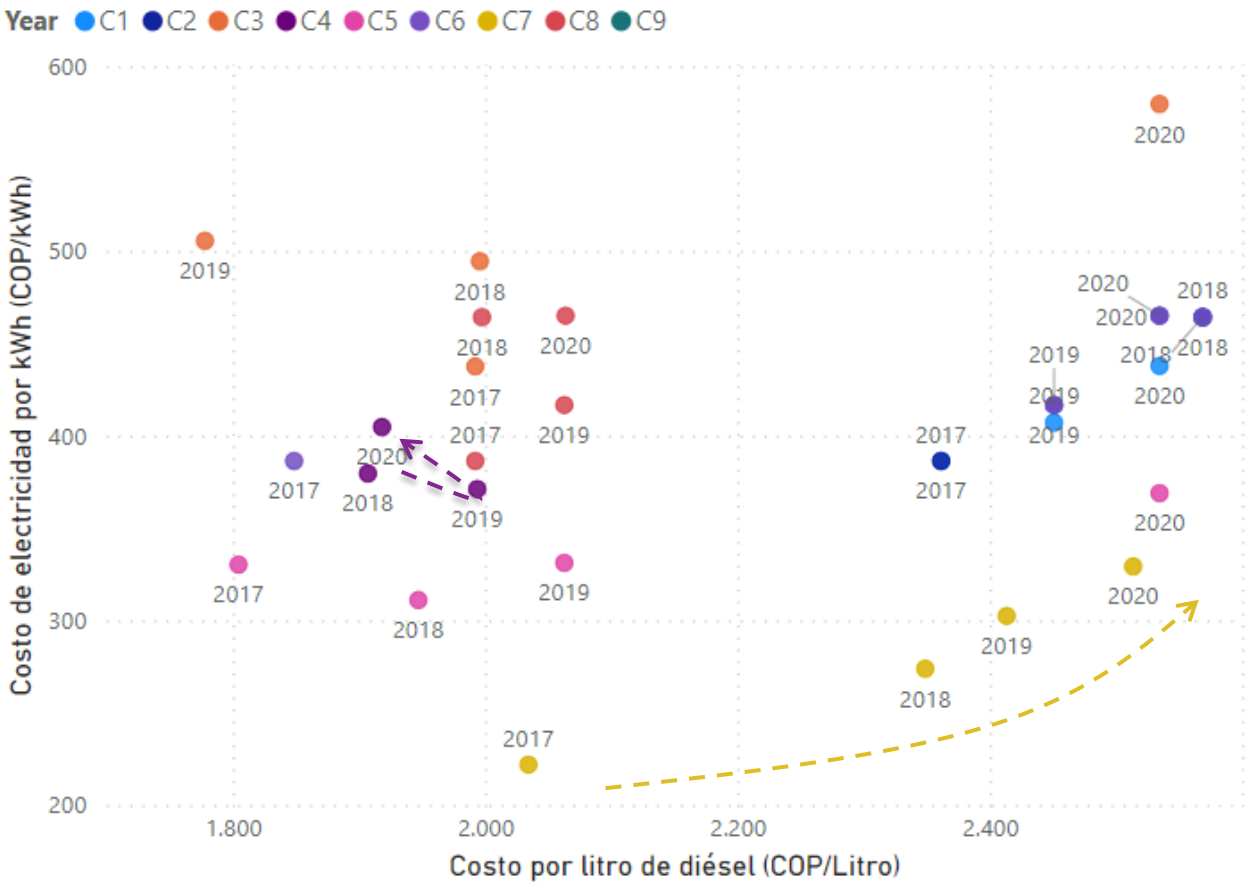



## Diesel

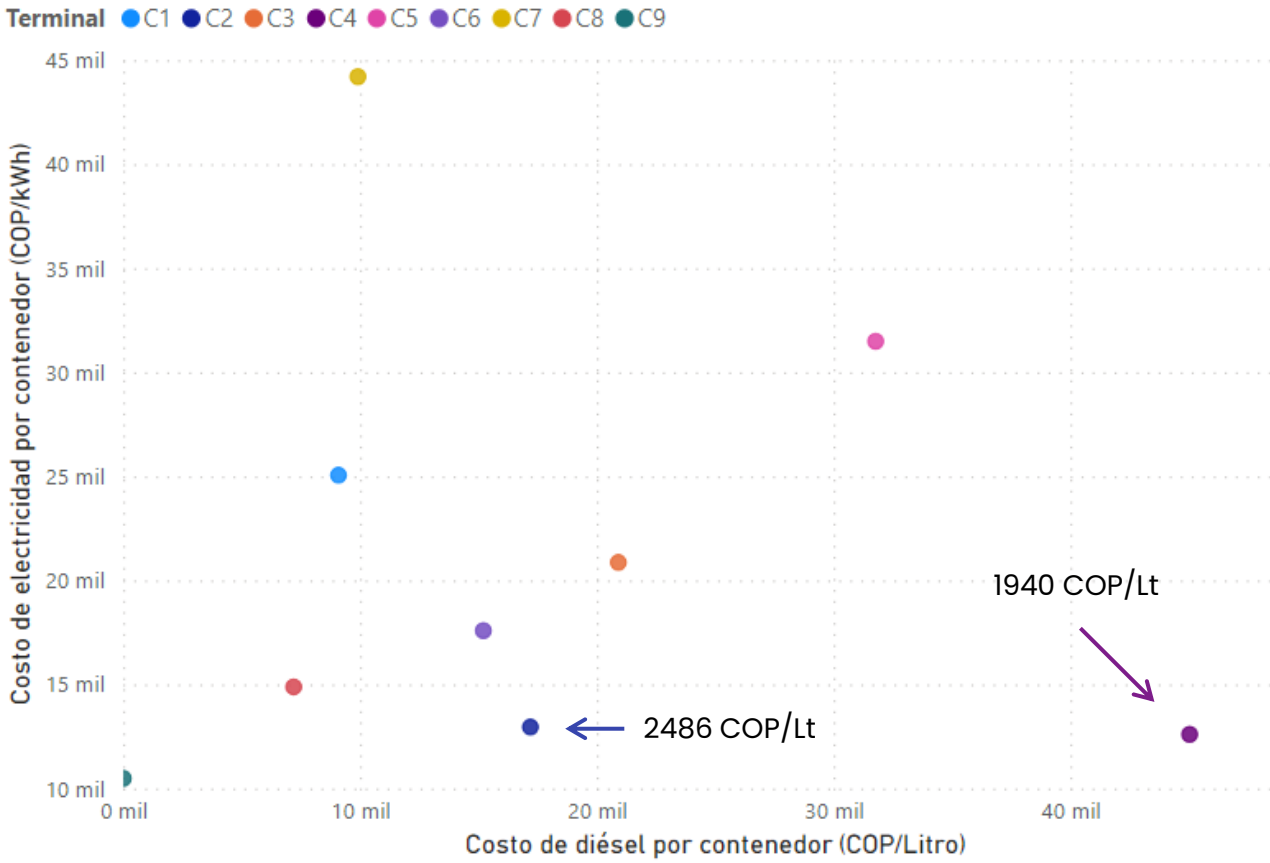


# Energy cost comparison, Colombia

## Energy unit cost

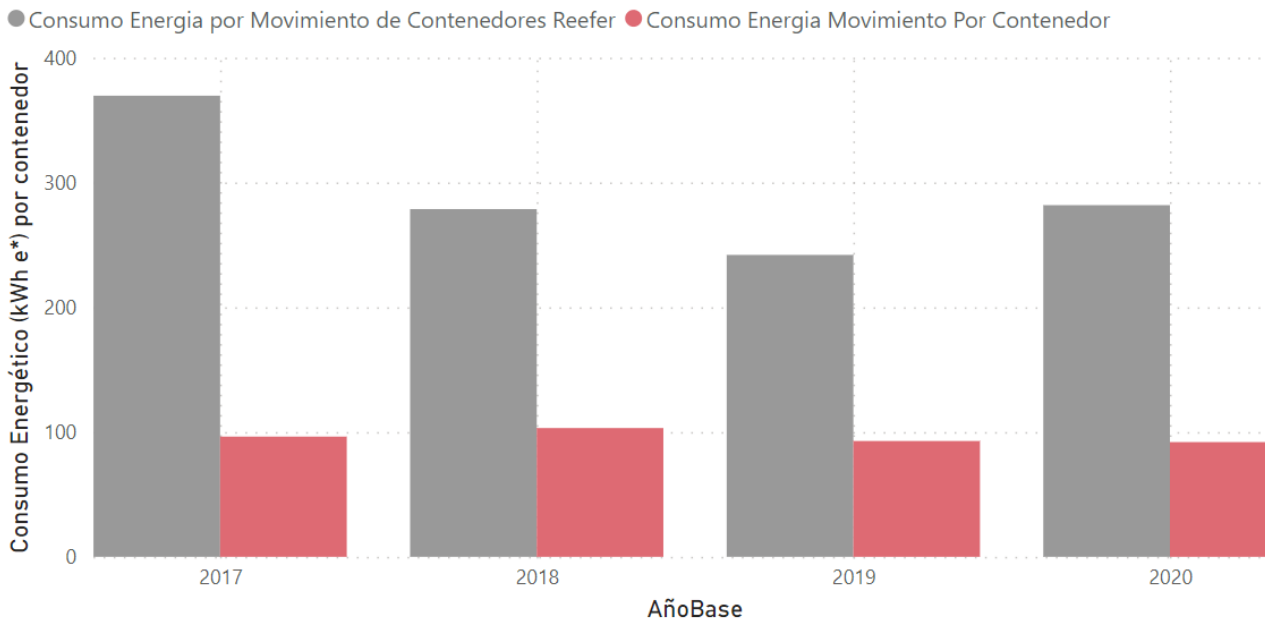



## Energy cost per container

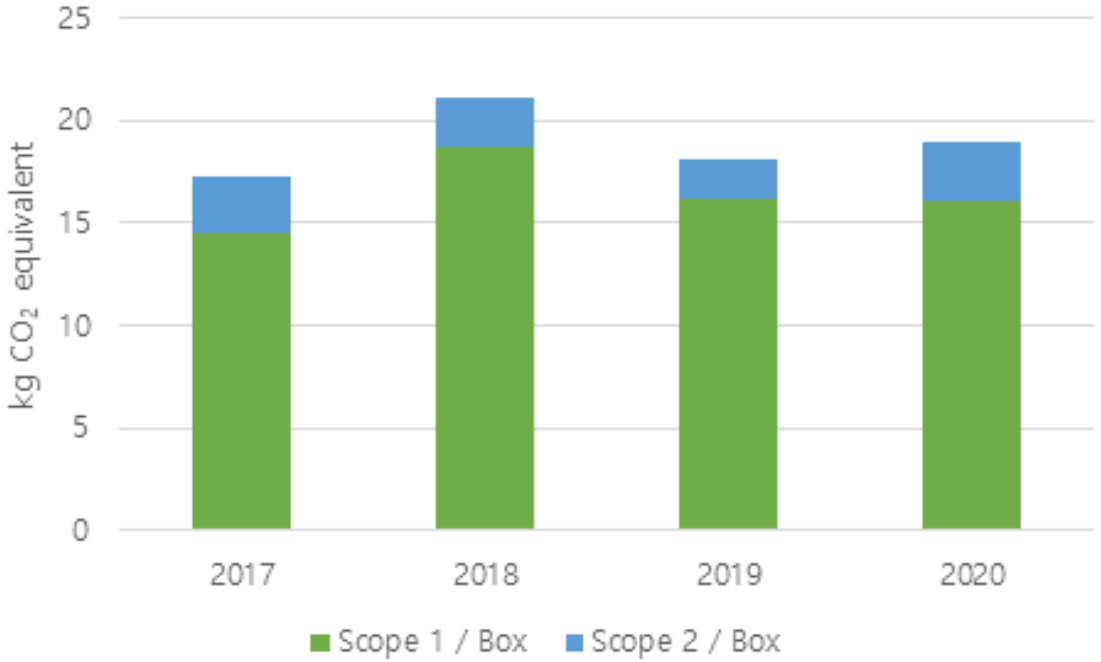


# Performance per container/box, Colombia

## Energy consumption reefer & dry




## Scope 1 and Scope 2 emissions dry



# Join the efforts!

Universidad de los Andes Colombia | KÜHNE-STIFTUNG | KLU KÜHNE LOGISTICS UNIVERSITY | CSGL

**Presentation**

This survey is a collaborative initiative between the Kühne Professorial Chair in Logistics at Universidad de Los Andes, Colombia, and KLU Kühne Logistics University. The objective of this study is to assess the energy efficiency and greenhouse gas emissions of Colombian ports, utilizing the activity-based methodology recommended by ECLAC and the guidelines of ISO 14083.

The study aims to identify best practices and assess the performance of the port sector to establish benchmarks and indicators.These metrics will help the sector set improvement goals, monitor current energy consumption, and develop models for future industry demands.

The results from this survey will enhance our understanding of energy consumption, facilitate better planning for the demands of ports and energy providers, and support the evaluation and monitoring of energy efficiency initiatives.

If you have any questions, please do not hesitate to contact us:

Prof. Dr. Gordon Wilmsmeier: g.wilmsmeier@uniandes.edu.co
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Ana Cristina Ocampo Wilches: aco_kuhne_chair@uniandes.edu.co

https://nexusenergiamovilidad.uniandes.edu.co/index.php/es/

All information will be treated confidentially.

# Thank you!


## Prof. Dr. Gordon Wilmsmeier

Email: Gordon.Wilmsmeier@the-klu.org


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