

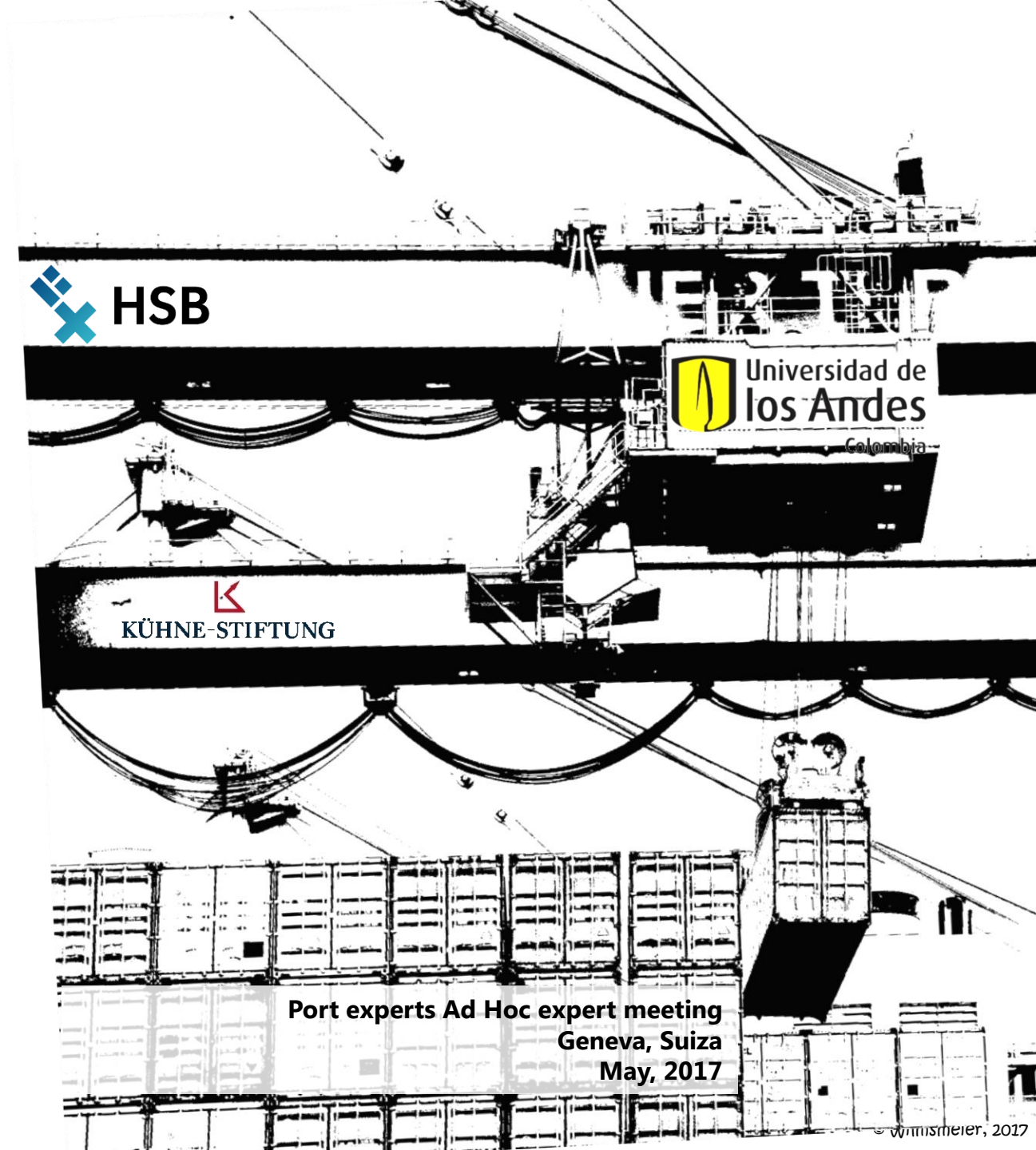
Energy efficiency and sustainability in ports

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Port experts Ad Hoc expert meeting
Geneva, Suiza
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What is a sustainable port?

Common themes and principles of responsible businesses and international organizations

- Sustainability includes three dimensions: economic, social and environmental.
- Sustainability is not a phase or a fashion - it is a necessity.
- It is equivalent to being competitive in the long term.
- Sustainability must be measurable (benchmark).
- It requires proactive approaches.
- Sustainability can only be reached when public and private sector co-operate.
- Sustainability means that organizations need to reach beyond their organizational boundaries (co-ordination, we cannot do it alone).



why should sustainability be discussed in the context of ports?

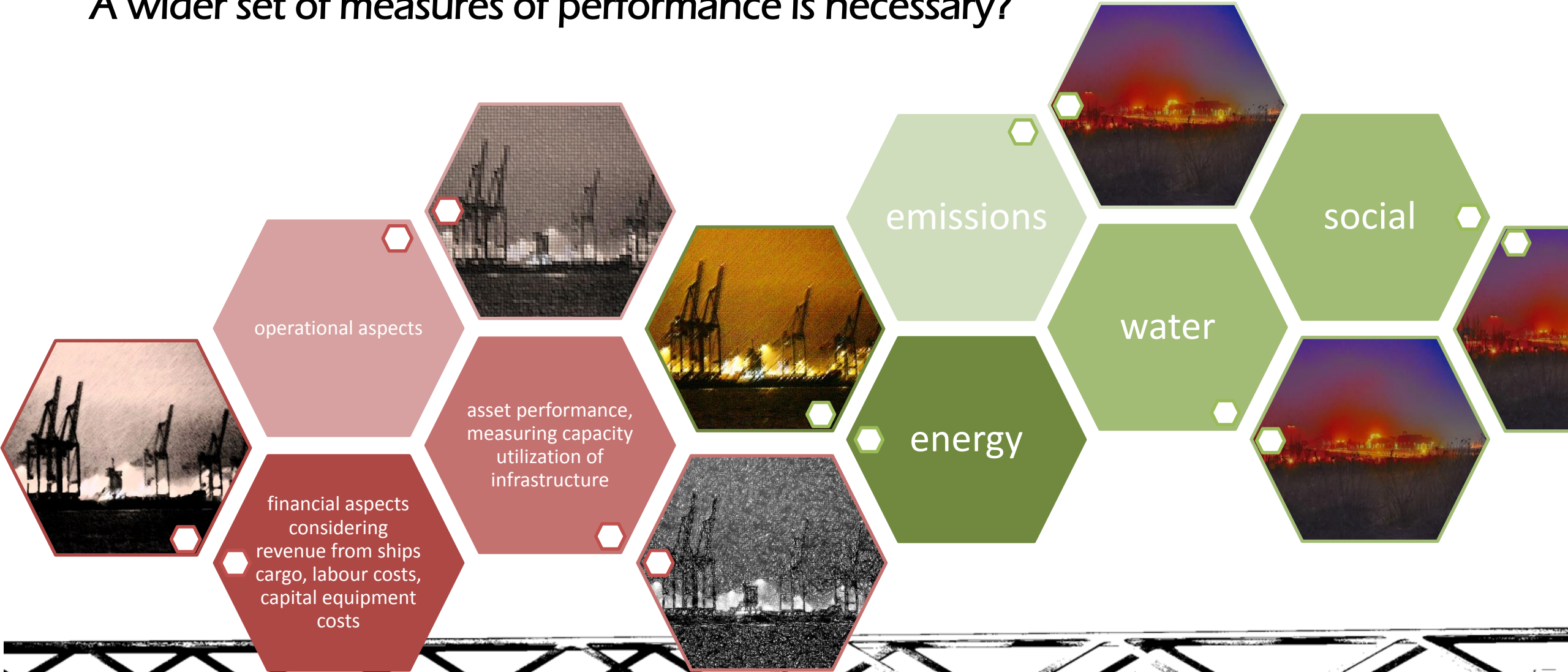


To reach efficient, sustainable and coordinated port performance the practitioner and governments need:

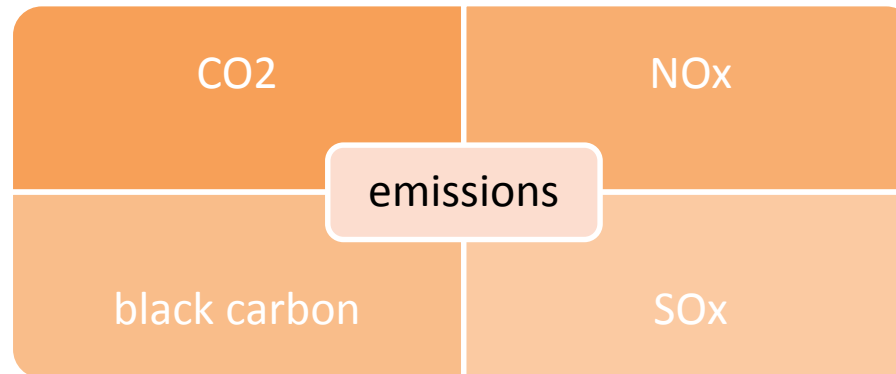
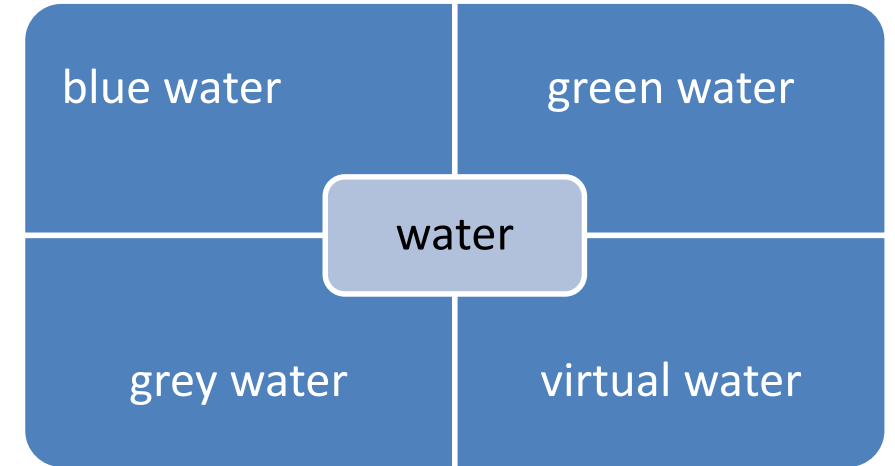
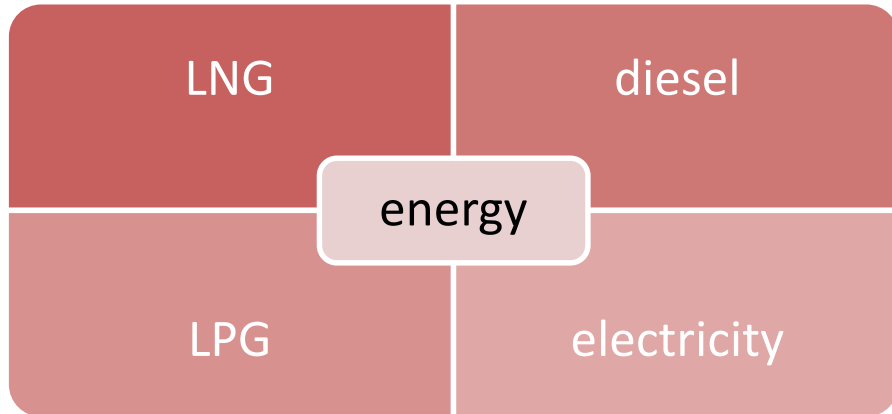
- Measurable outcomes;
- Commitment from the boardroom to the shop-floor;
- Effective and predictable public administration and policies;
- Collaboration;
- CSR (corporate social responsibility).



A wider set of measures of performance is necessary?

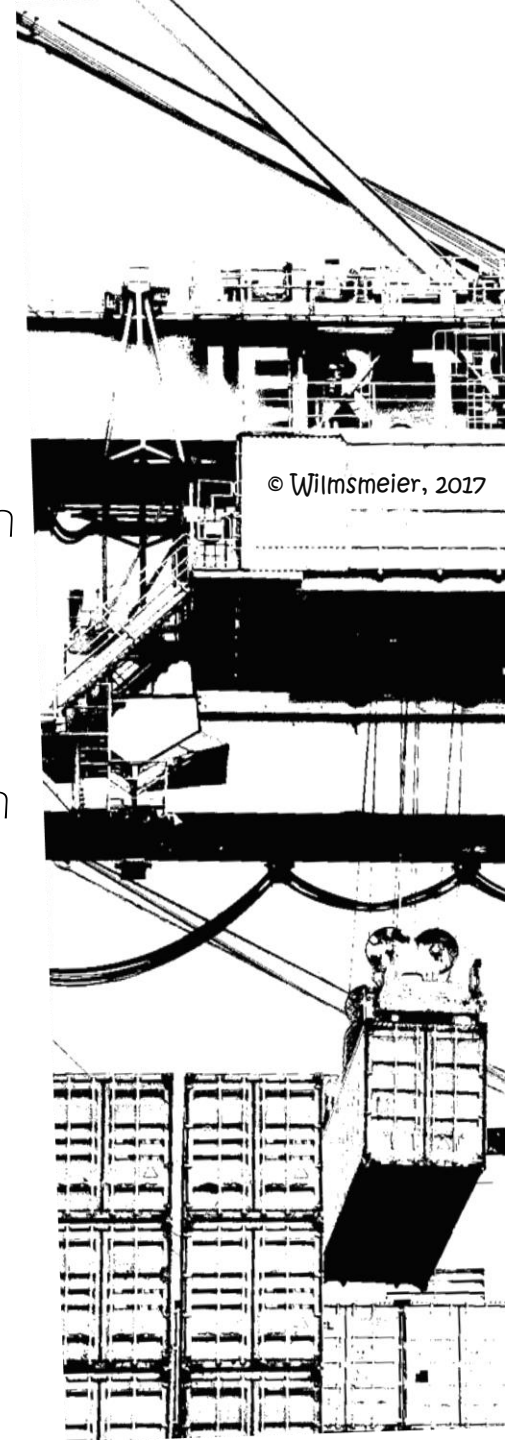


New data and measures are not simple

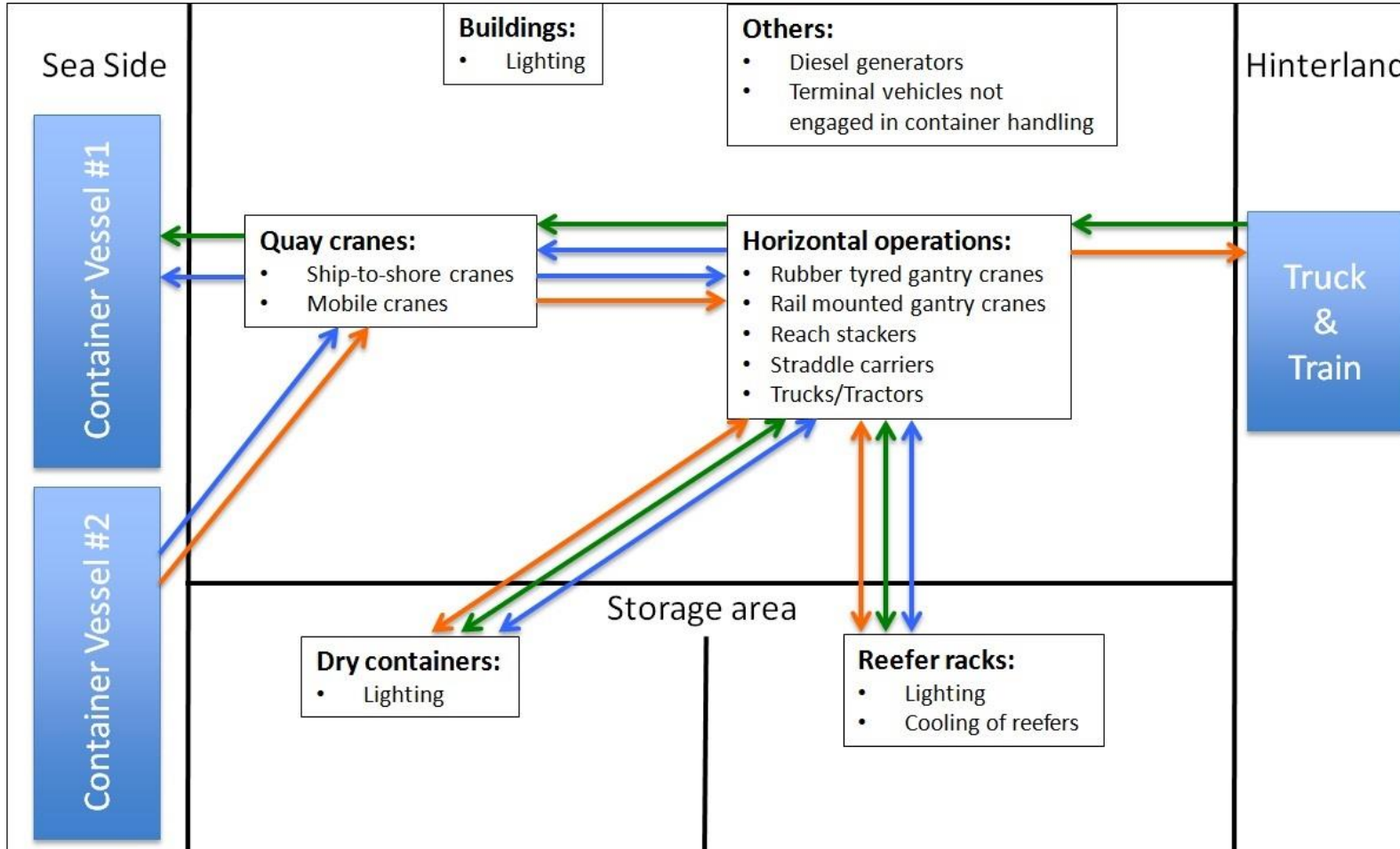


Relevant certifications

- ISO 14001: this is a group of management system standards which are applied to improve the environmental performance in organizations.
- Green Ports: a certification that shows balancing between environmental protection and economic demand.
- Ecoports: This is integration between two concepts: effective environmental and port management.
- ISO 50001 - Energy management standards target to use energy efficiently through the development of an energy management system (EnMS).
- CEN 16258
- GHG Protocol (adopted by ISO 14064-1)
- ISO 14046 – Water footprint



example: an activity based approach to allocate energy consumption



- ← Green arrow: Export container
- ← Orange arrow: Import container
- ← Blue arrow: Transhipment container

Source: Spengler 2015



Example: new collaborations - Chile



Consumo y Eficiencia Energética

en los Principales Terminales Portuarios de Chile (1)

Principales Cifras (2)

Período enero - diciembre 2014



Boxes Transferidos
1,1 millones



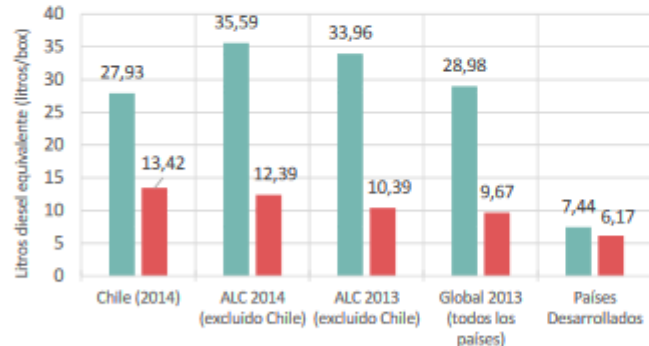
Consumo Diesel (litros)
9,9 millones



Consumo Electricidad
40,7 GWh

Análisis del Consumo Energético (**)

según tipo de contenedor

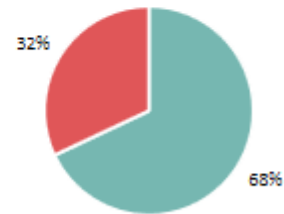


Tipo de contenedor

Contenedores Refrigerados (3)

Contenedores Secos

Distribución del Consumo Energético (Chile 2014)



(**) Consumo diesel equivalente por contenedor: Consumo de energía total por contenedor manejado en una terminal calculado en litros de diesel equivalente.

8%

mayor, es el consumo energético en operaciones asociadas a los contenedores secos en Chile, en relación a los países de América Latina y el Caribe para el año 2014.

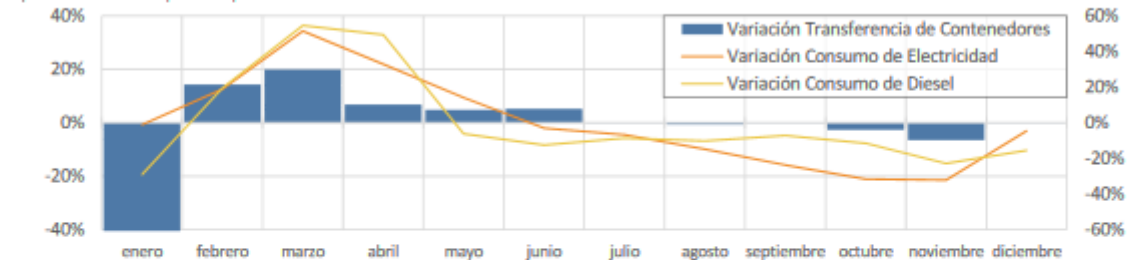
22%

menor, es el consumo energético en operaciones asociadas a los contenedores refrigerados en Chile, en relación a los países de América Latina y el Caribe para el año 2014.

Análisis del Consumo Energético

según mes del año

Evolución Mensual de Transferencias de Contenedores (eje izquierdo) y Consumo Energético de Diesel y Electricidad (eje derecho), evolución porcentual con respecto al promedio anual



20%

de aumento en el número de contenedores, con respecto al promedio anual, se produce en el mes de marzo.

40%

de aumento en el consumo de diesel, con respecto al consumo promedio anual, se produce en el mes de marzo. Esto se debe a una mayor actividad de exportación de carga refrigerada (fruta) en la época de verano.



Notas: América Latina y el Caribe (ALC), 4 países; países desarrollados, 4 países; global, 17 países.

(1) Se consideran los 4 principales terminales portuarios a nivel país.

(2) Los valores exactos son: 1.103.439 boxes (considera contenedores secos y refrigerados), 9.893.355 litros de diesel, y 40.722.872 KWh.

(3) Se consideran sólo contenedores llenos.

(4) Se consideran 2 de los 4 principales terminales portuarios a nivel país.

new tools

Sustainable Performance Monitor

- Introduction**

There is a continued need to improve the performance of terminals to make them not only more competitive, but also more sustainable. The concept of sustainability has been recognized by industry to be an important contributor to the firm-specific competitive advantage.

This independent research initiative aims to identify best practice and performance examples in the port sector to establish a set of global bench-marking indicators.

To support terminals and create direct value added to the participants this online tool allows the terminals to benchmark themselves against the other terminals participating in the initiative in key strategic areas: e.g. productivity, emissions, energy efficiency, and water consumption.

The tool is being developed at the University of Applied Sciences Bremen, Germany in collaboration with the Universidad de los Andes, Colombia and supporting research at the Economic Commission for Latin America and the Caribbean, the Global Logistics Emissions Council and private sector entities (global and local terminal operators) among others. Currently, the initiative counts with the participation of over 140 terminals from four continents.

The initiative aims to:

 - provide the participating terminals with an online tool that allows for managing and analysing energy efficiency and productivity in the terminal.
 - monitor and improve the data regarding productivity, water and energy consumption, as well as and efficiency and other KPIs.

The applied methodology has been developed by United Nations Economic Commission for Latin America and the Caribbean (ECLAC) and the University of Applied Sciences in Bremen, Germany, as part of the efforts to reach the Sustainable Development Goals (SDGs) and to support countries and companies to improve and benchmark their performance under certain sustainability criteria.

All data are treated strictly confidential. All data at the individual terminal level obtained through the initiative, will be coded or de-identified. Under no circumstances will the identifiers be made available to individuals.

For further information please contact us at contact@spm-terminals.com
- Findings**

Trends in the Shares of Energy Sources

Percentages

Diesel is the main energy source in container terminals across the globe but might be as low as 50% in Japan or 60% in Vietnam for reference terminals in these countries. In Latin America and the Caribbean the shares of diesel and electric energy use have been almost constant over the last years. The current dependency on fossil fuels marks a significant potential towards electrification. However, the variation of consumption patterns across terminals depends significantly on the equipment configurations in each terminal.

Year	Diesel (%)	Electricity (%)
2010	~68	~32
2011	~67	~33
2012	~67	~33
2013	~66	~34
2014	~66	~34
2015	~67	~33

Source: *Wilmsmeier G. and Spengler T. (2016), "Energy consumption and container terminal efficiency"*
- Login**

gordon

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[Forgot your password?](#)
- Request Account**

Country

Select country...

Terminal Name

Terminal Name

Port Name

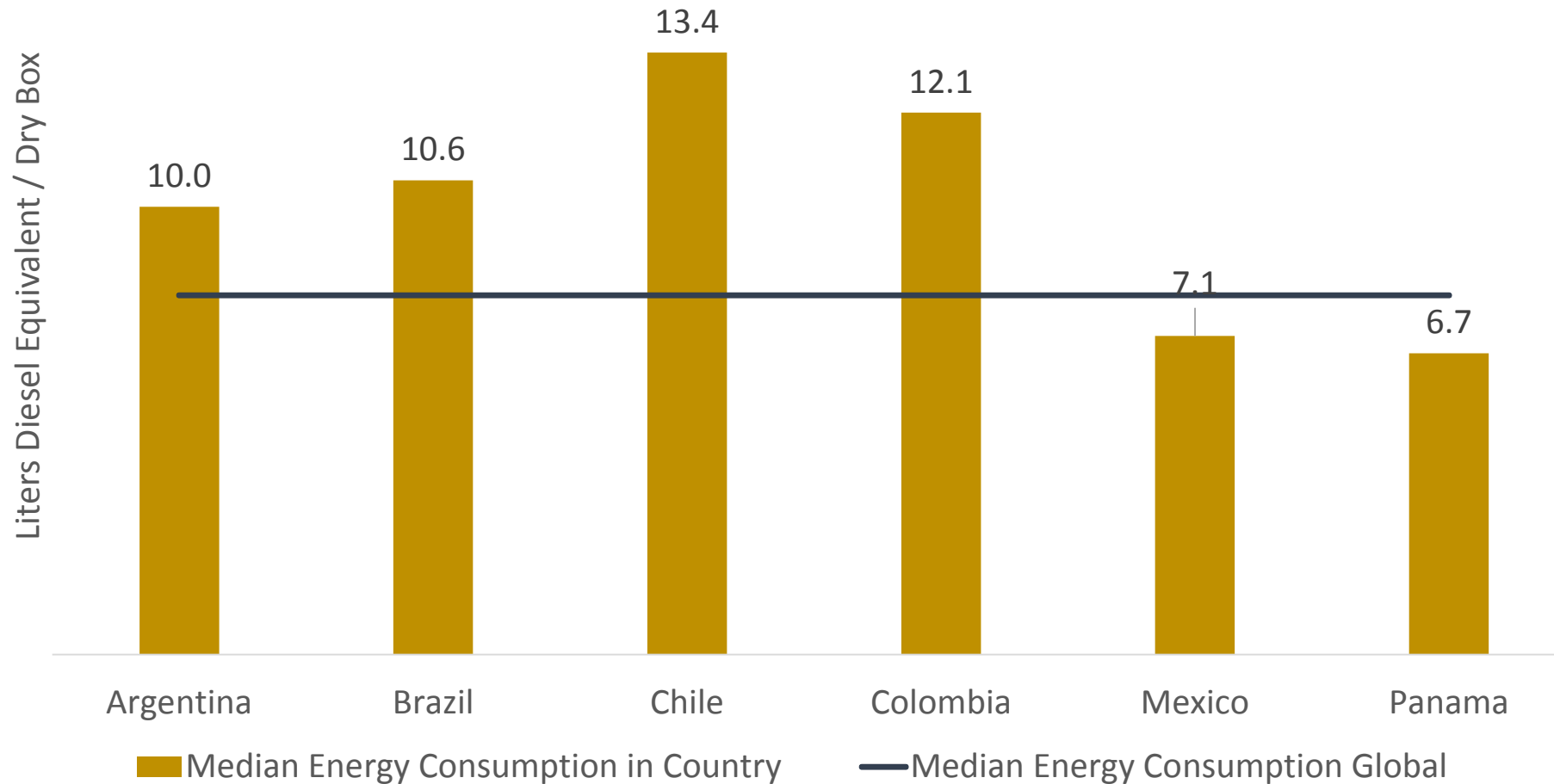
Port Name

Operator

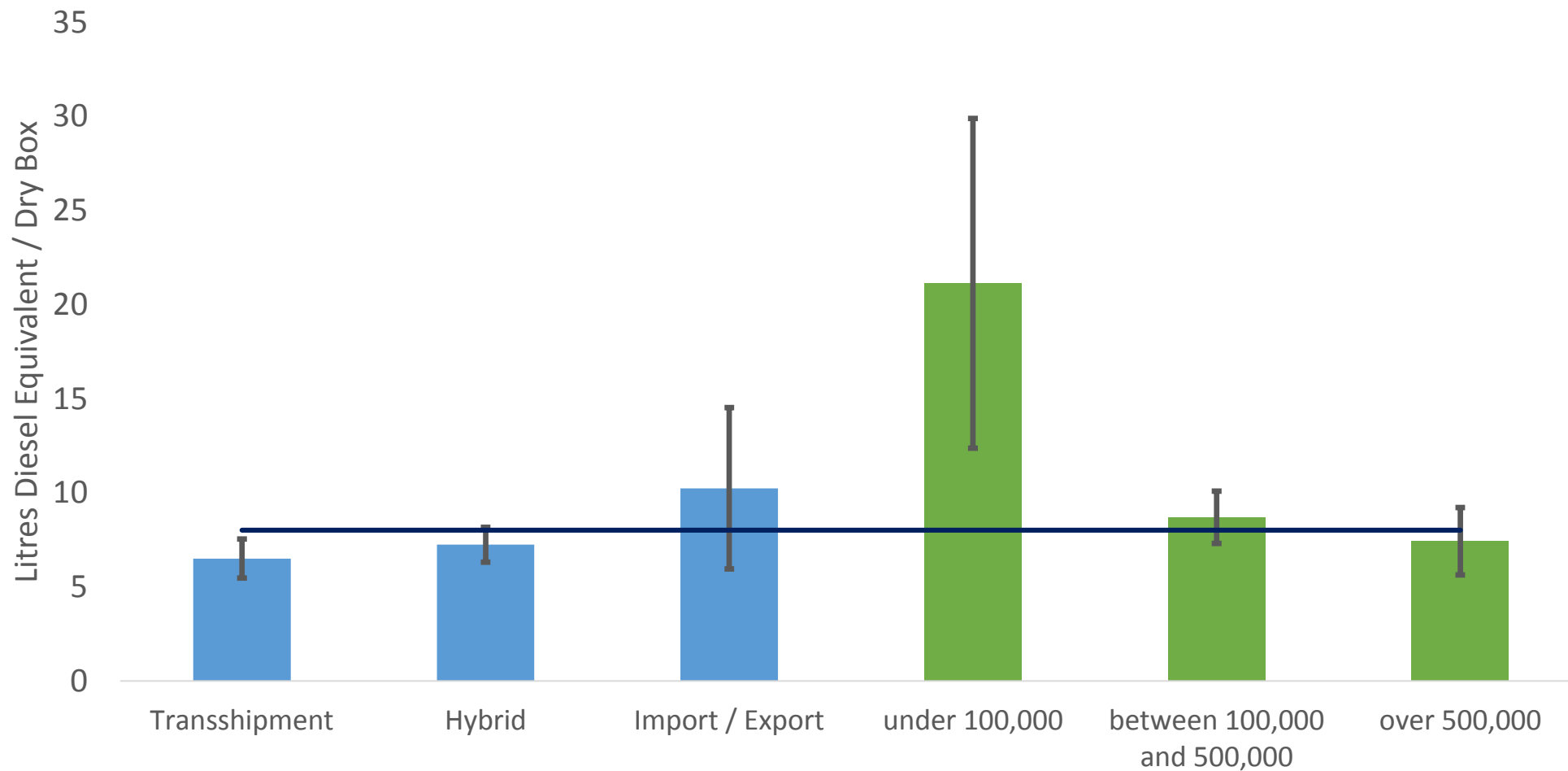
Operator

Visit: <https://spm-terminals.com>

Median litres of diesel equivalent consumed for handling one dry box (excluding reefer consumption), by country, 2012-2015



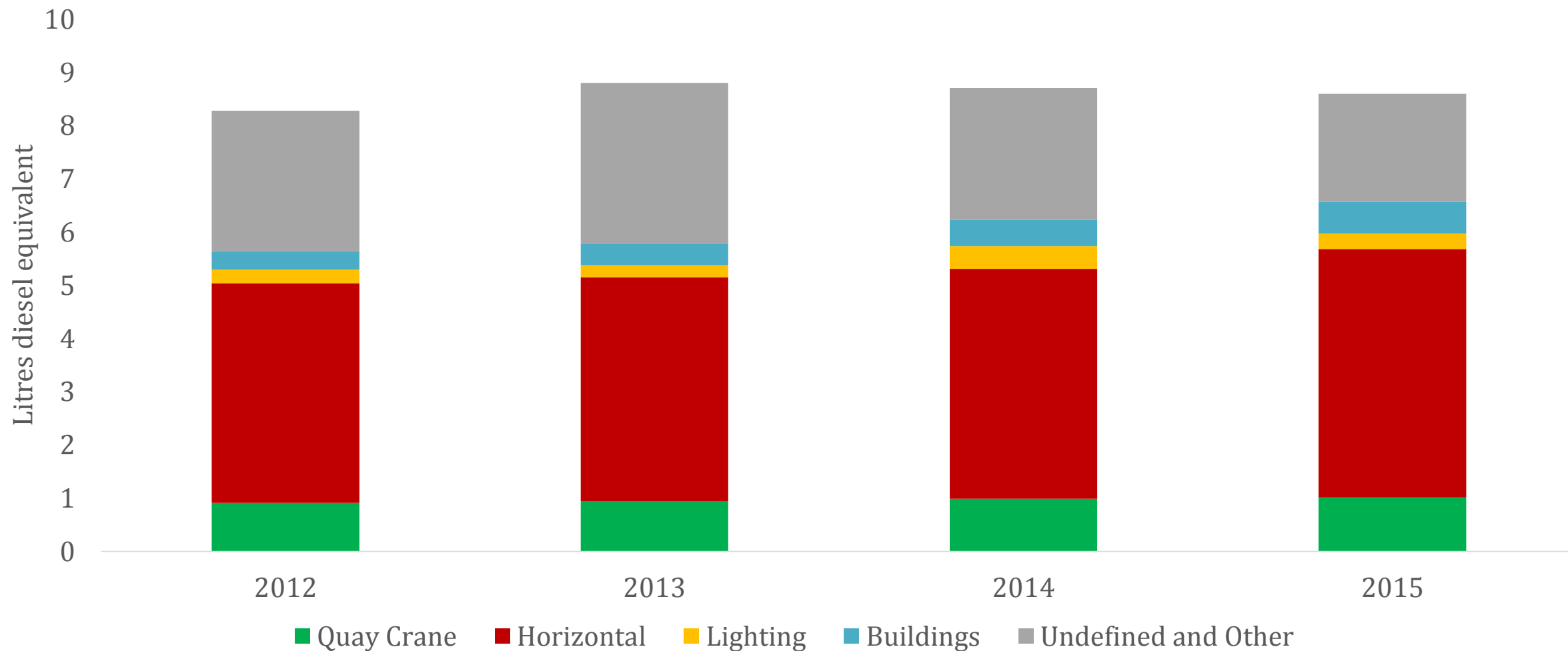
Median litres of diesel equivalent consumed for handling one dry box (excluding reefer consumption), by type and size of terminal, years 2012-2015



Source: Authors based on Wilmsmeier and Spengler (2016) and ECLAC Infrastructure Services Unit
Note: The calculations are based on data for 25 terminals in 8 countries



Median litres of diesel equivalent consumed per activity cluster (excluding reefer cooling), 2012-2015



■ Quay Crane ■ Horizontal ■ Lighting ■ Buildings ■ Undefined and Other

Source: Authors based on Wilmsmeier and Spengler (2016) and ECLAC Infrastructure Services Unit

Note: The calculations are based on data for 31 terminals in 16 countries

Next steps for moving ahead

- strengthen concerted effort of public and private sector
- further develop and use tools to gather new data
 - Water
 - Energy
 - Emissions, and
 - Social indicators
- collaborate towards a new standard of information
- can we walk the talk of a sustainable future?



questions?

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