Sustainable Subsea Networks

Future of Metrics for Subsea Networks

January 22, 2024 3:00 PM-3:45 PM

PACIFIC TELECOMMUNICATIONS COUNCIL

PTC'24

21-24 JANUARY 2024 | HONOLULU, HAWAII

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Sustainable Subsea Networks

- Academic-industry partnership
- Working to enhance the environmental sustainability of subsea telecommunication networks

Presenters

Emmanuel Danjou

Emmanuel is the Head of Business Development at Alcatel Submarine Networks. Emmanuel is a highly recognized and respected executive with over 24 years' experience in the telecommunications industry.

René d'Avezac de Moran

René is the COO of OMS Group. René has over 25 years' experience in various aspects of the offshore marine industry, particularly submarine cables.

Brian Lavallée

Brian is the Senior Director, Product Marketing at Ciena with 20+ years of experience spanning Marketing, Product Line Management, Systems Engineering, Research & Development, and Manufacturing.

Nicole Starosielski

Nicole is Professor of Film and Media at the University of California-Berkeley, and author of *The Undersea Network* (2015).

Sustainable Subsea Networks Working Group

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Matthew Bowden, Red Penguin Marine
Jack Bullen, Aqua Comms
Nancy Cai, Telstra
Merete Caubet, Bulk Infrastructure
Nathalie Chaigne, Alcatel Submarine Networks
Michael Clare, National Oceanography Centre
José Chesnoy, Independent
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Emmanuel Danjou, Alcatel Submarine Networks
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Abdul Ravoof, stc/center3
Jamy Rousseau, Orange
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Connor Shipton, Vodafone
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Takahiro Kashima, NEC
Pushkar Tandon, Corning
John Tibbles, SubOptic Foundation
Alex Vaxmonsky, Equinix
Qian Zhong, Google

Phase 1: Best Practices 2021-2023

115 page Sustainable Practices Report:

Certifications

Manufacturing

Installation & Maintenance

Cable Landing Station

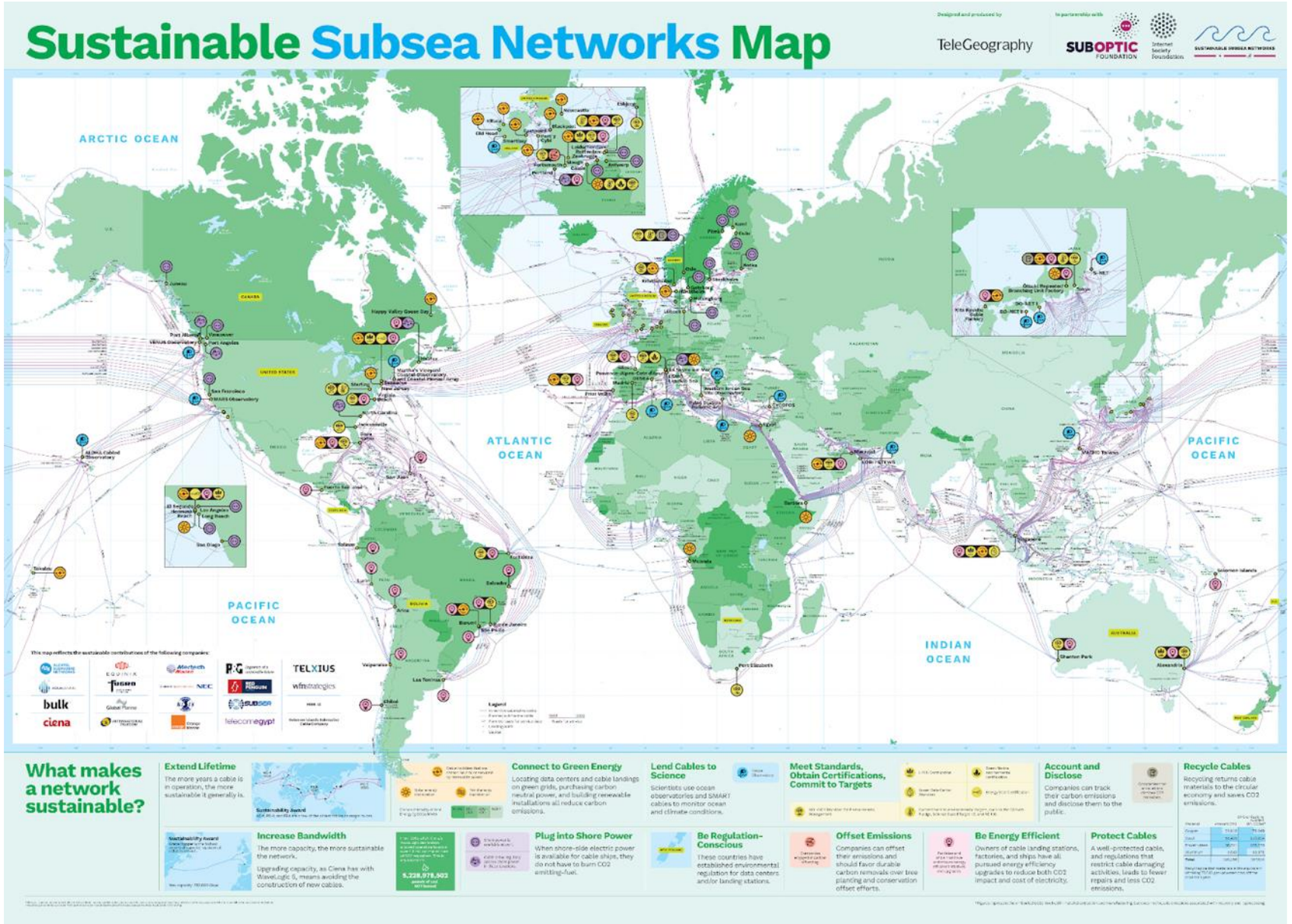
Business Practices

End-of-Life

Contributions from:

A-2-Sea
Alcatel Submarine Networks/Nokia
Aqua Comms
Barcelona Cable Landing Station
BT Group
Bulk Infrastructure
Ciena
Cisco
Corning
Digital Realty
E-marine
EGS Survey
EllaLink
Equinix
Fugro
Fujitsu
Global Marine
Globe Telecom
GlobeNet
Google
Hexatronic
HMB-IX
Indigo TG
Infinera
IT International Telecom
Jiangsu Hengtong Marine Cable Company
KDDI
Keppel Corp
KT
Makai Ocean Engineering
Mertech Marine
Meta
Microsoft
NEC
Nexans
NJFX
NTT Group
Orange
Orange Marine
R&G Telecom
Red Penguin Marine
Saildrone
Singtel
Solomon Islands Submarine Cable Company
Southern Cross Cable Network
Subsea Data Systems
Subsea Environmental Services
Tata Communications
Telecom Egypt
Telstra
Telxius/Telefónica
Vodafone
WFN Strategies
Xtera

Phase 1: Best Practices 2021-2023



Phase 1: Best Practices 2021-2023

sustainable SUBSEA

A BLUE INDUSTRY GOING GREEN

BY NICOLE STAROSIELSKI AND NICK SILCOX

In 2021, the Sustainable Subsea Networks research project was launched. This was one of the first projects of the newly-formed SubOptic Foundation, a charitable arm of the SubOptic Association that is working to advance education and research initiatives for the subsea cable industry.

The Sustainable Subsea Networks research project grew out of SubOptic's Global Citizen Working Group, which focuses on developing ways for the subsea cable industry to better itself and the world. This research project's focus is on the investigation of the cable system's energy use and impact across various sectors, from supply to recycling. Even though the industry is already relatively green, industry and academic members of the research project are working to enhance environmental sustainability as much as possible—a crucial project given the devastating impacts of climate change.

Over the past decade, many companies have begun to investigate green data centers, but very little attention has been paid to subsea cables' role in a greener telecommunications future—possibly because cables clock in at a smaller footprint. This is something that many in the industry already know, but it needs to be documented especially as green regulation and legislation is rolled out globally.

From talking to companies, the research team has found several already ahead of the curve on greening their operations. Below, we share some of these best practices to generate inspiration and conversation about the path forward.

The Sustainable Subsea Networks research project grew out of SubOptic's Global Citizen Working Group, which focuses on developing ways for the subsea cable industry to better itself and the world.

ABOVE AND BEYOND: ORANGE MARINE TAKES STEPS TOWARD A GREENER INTERNET

Some companies have begun to consider the environment at nearly every level of their operations and practices. This is certainly the case with Orange Marine, a subsidiary of the French telecommunications company Orange. Since 2017, Orange Marine has prioritized sustainability and made significant strides toward reducing their environmental impact in both technical and business practices.

Installing and maintaining subsea cables is a fuel-intensive component

14 SUBMARINE TELECOMS MAGAZINE

"What Does Greenhouse Gas Regulation Mean for Marine Operations? A Look at the International Maritime Organization and the European Commission's New Requirements." (Nov 2023)

"Tips for Avoiding Scandal and Building Credible Sustainability Practices." (Jul 2023).

"The SubOptic Foundation Congress on Sustainability." (May 2023).

"Sustainability at PTC '23: Three Takeaways." (March 2023).

"A New Era of Sustainable Network Hubs? The Subsea Cable – Data Center – Renewable Energy Connection." (January 2023).

"Greening of Maritime Ports: Is Regulation The Game Changer?" (Nov 2022)

"More Cables = Less Carbon? The Internet's Contentious Carbon Footprint and a Subsea Solution." (September 2022).

"Flying the Skies to Wire the Seas: Should the Subsea Cable Industry Stop Traveling?" (May 2022).

"Energy + Telecommunications: Bringing Together Two Worlds at the Cable Landing Station." (March 2022).

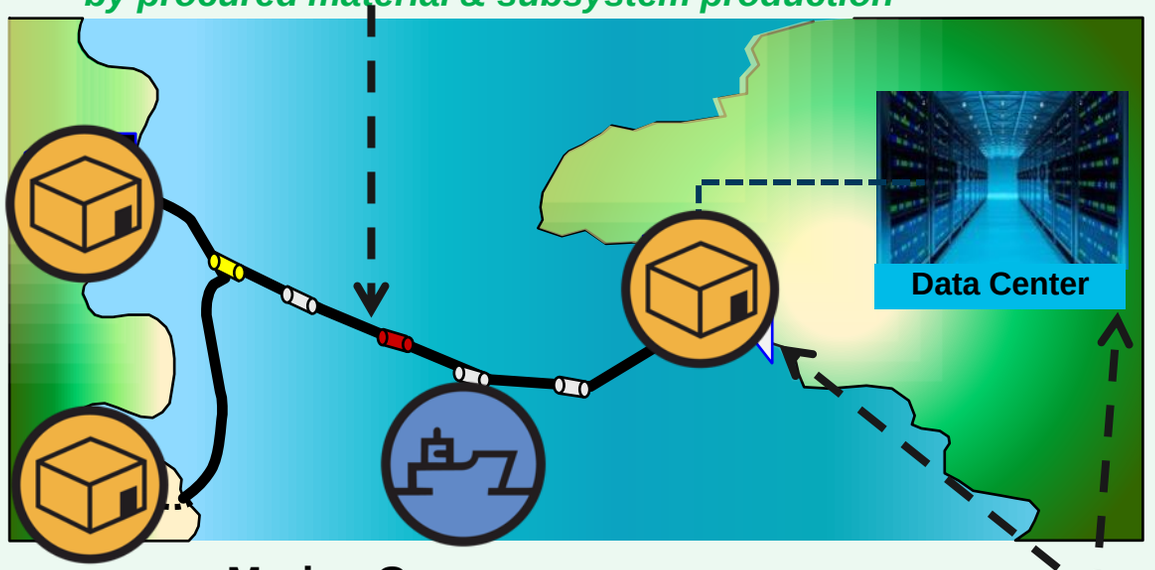
"A Blue Industry Going Green." (January 2022).

Phase 1: Best Practices 2021-2023

SubOptic Congress on Sustainability, Bangkok, Thailand March 2023

Phase 2: Metrics for Sustainability

Cable Group:
Cable, Repeaters, Branching Units and ROADMs
Eco-conception, Energy consumed by procured material & subsystem production



Recovery & Recycling Group
Fuel consumption, Eco-conception, Energy consumed to recycle

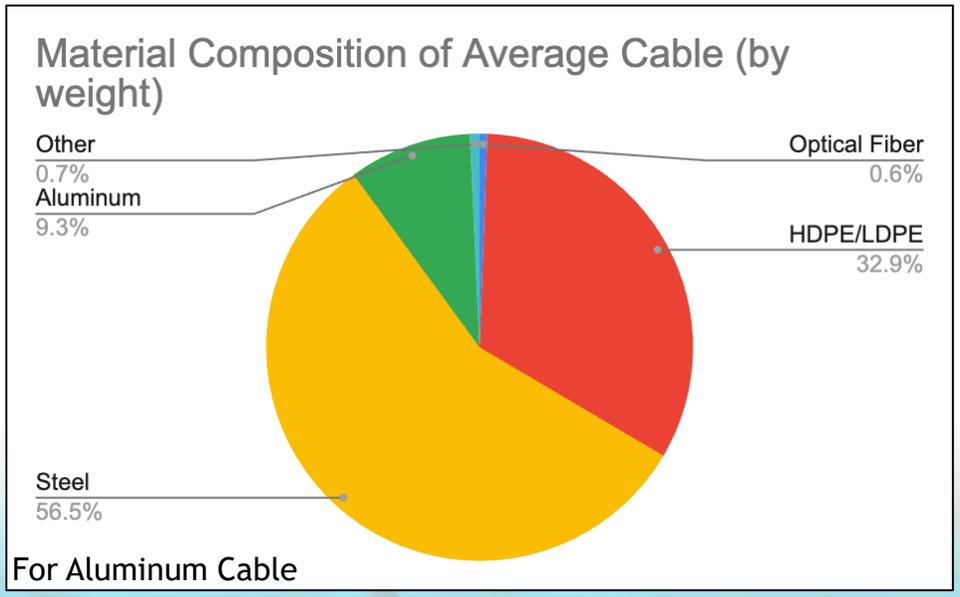
Marine Group
Survey, Installation and Maintenance Vessels
Fuel consumption both during construction and lifetime repairs

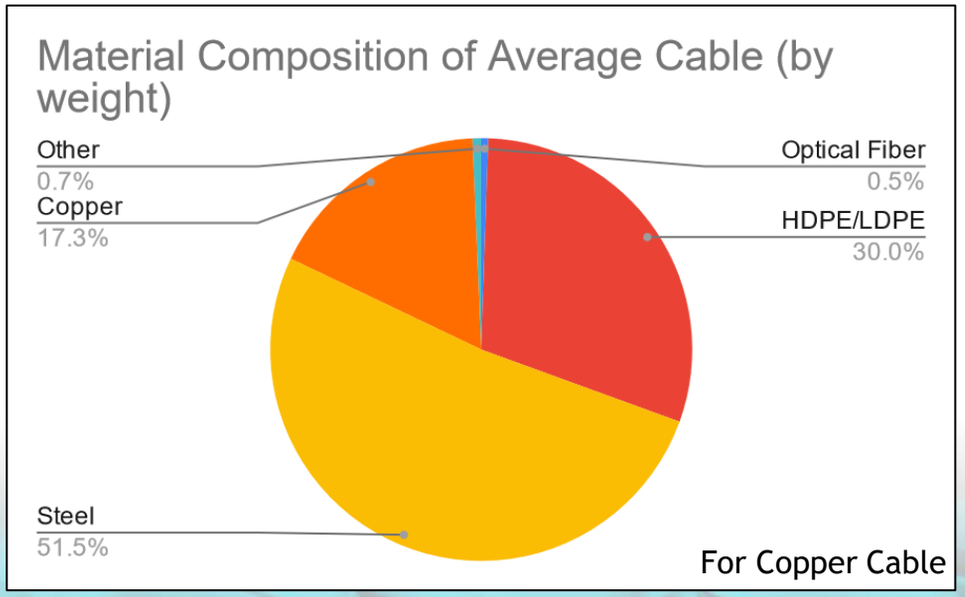
CLS Group
Cable Landing Station (CLS)
Efficiency, performance, and green energy

The BIG OPEN QUESTION:
What is the relative production of emissions generated in the process of manufacturing, installing, operating, and managing the end-of-life of a cable?

Cable Group

- Will describe the emissions generated by the raw materials and manufacture of the cable.
- **Lead**: Emmanuel Danjou, ASN

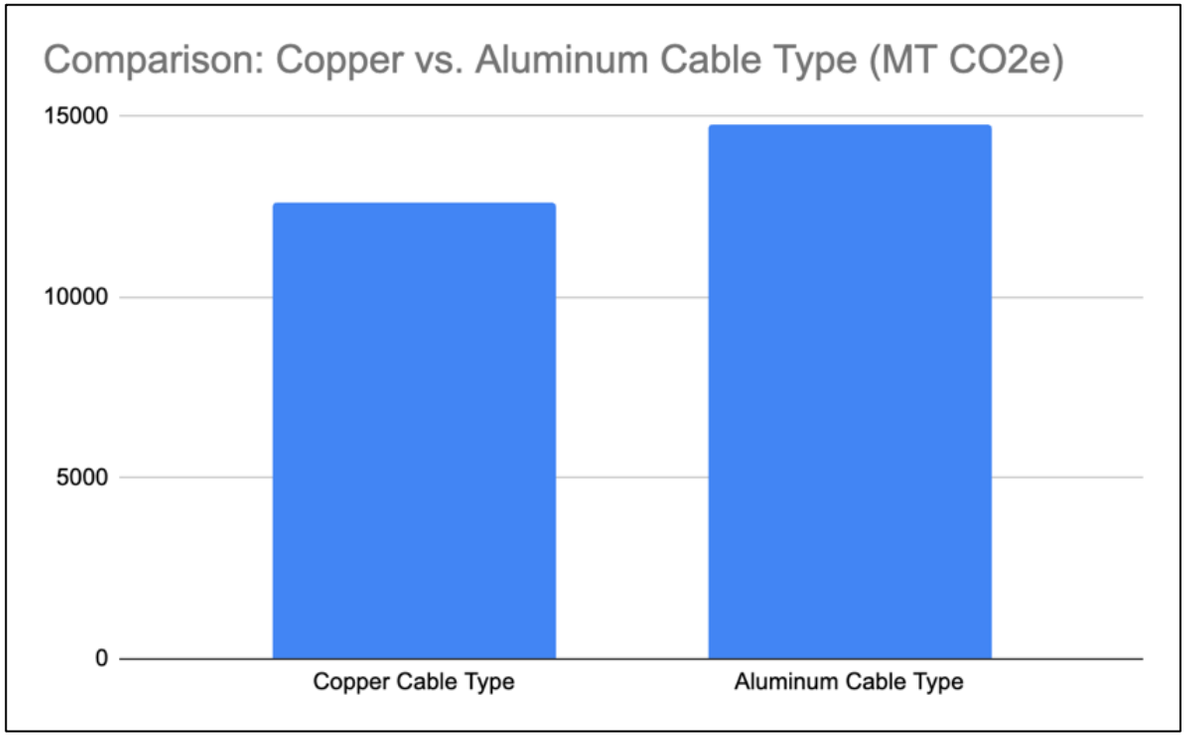




Results will be updated once we will have information from other suppliers.

Cable Group

CO2 emission per cable type



The aluminum cable needs less energy consumption than the copper. Not yet taken into account in this study but suppliers are working on it to be able to measure it.
Target: Monitor the electricity consumption for 1km of cable per type.

Cable Group

Existing relevant metrics/standards:

ISO 14040:2006
Environmental management
Life cycle assessment
Principles and framework

ISO 14044:2006
Environmental management
Life cycle assessment
Requirements and guidelines

Includes:

Cable raw materials: glass, copper, steel, aluminum, HDPE/LDPE

Energy used in cable manufacturing

Excludes:

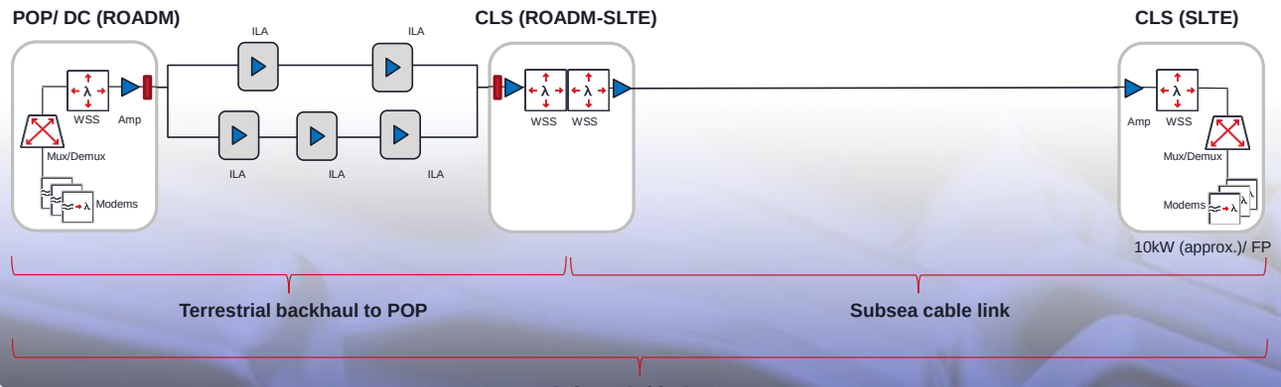
Repeaters : owners/suppliers to evaluate in 2024

Branching units

Transit

CLS Group

- Will describe emissions generated by ongoing CLS, SLTE operations.
- Considerations include facility ownership, measurement capabilities, education.
- **Lead**: Vedrana Stojanac, Ciena



CLS Group

Existing relevant metrics/standards:

European Code of Conduct for Energy Efficiency in Data Centres

ISO/IEC 30134-2 International Standard (Information technology – Data centres – Key performance indicators – Part 2: Power usage effectiveness (PUE))

Includes:

Power used by CLS

Disaggregated power used by SLTE and PFE when located in a data center

Emissions generated by production of SLTE

Measurement specification, categorization, reporting of the PUE metric

Excludes:

Emissions generated by production of PFE (suppliers to evaluate in 2024)

Submarine cable specific boundaries (architecture, partial equipment usage)

Marine Group

- Will describe the emissions generated in marine operations.
- Considerations include fuel efficiency, journey planning, speed optimisation, remote operations, cable protection, and repairs.
- **Lead**: René d'Avezac de Moran, OMS

Marine Group

Existing relevant metrics/standards:

International Maritime Organization standards

EU Standards

EPA Standards

Includes:

Fuel consumed in survey operations
Fuel consumed in installation surface lay
Fuel consumed in installation ploughing
Fuel consumed in inspection (PLGR + PLI)
Fuel consumed in repair
Fuel consumed while in port for maintenance vessels

Excludes:

Construction of ships
Fuel consumed while in port for installation vessels
Transit to starting port

Recovery & Recycling Group

- Will describe the emissions generated in the recovery & recycling of the cable.
- **Lead**: Nicole Starosielski, UC Berkeley

GOAL

- To be able to describe relative emissions generated by a cable across its lifecycle (a cable owner's Scope 1, 2, and 3 emissions).
- To identify and highlight relevant metrics across all stages of the cable's life cycle.

PTC 2025

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