

THE SUBOPTIC FOUNDATION CONGRESS ON SUSTAINABILITY

BY IAGO BOJCZUK

The bustling city of Bangkok, Thailand hosted the 10th edition of the SubOptic conference from March 13th to 16th, 2023. The longest-running and most comprehensive conference in the global subsea cable industry, SubOptic reconvened with the theme “Navigating the Open Seas—Collaboration on Our Critical Infrastructure.” The conference, last held in 2019 in New Orleans, widened its scope and interest in sustainability topics for 2023.

From day one, sustainability took center stage, building on the momentum of other recent industry events, such as the 2023 Pacific Telecommunications Conference in Honolulu, Hawaii. Maja Summers, Vodafone Carrier Services representative and Chair of the Program Committee for SubOptic 2023, emphasized that for gatherings of global scope such as SubOptic, “the environmental and social responsibility of the subsea community needs to be in focus.” This year’s call for participants encouraged for the first time the submission of research and initiatives to the “Clean Green Submarine” track, spanning topics such as renewable energy, green marine operations, and optical environmental sensing technologies.

Indeed, sustainability-related initiatives and projects were a central theme throughout the conference. Urs Hölzle, Senior Vice President for Technical Infrastructure at Google, kicked off the conference with a keynote presentation in which he

presented on Google’s work to achieve a carbon-free internet. Over the following days, conversations encompassed a variety of environmental topics, from the recent approval of the long-awaited United Nations High Seas Treaty, to innovative SMART (Science Monitoring and Reliable Telecommunications) cable systems, to carbon reduction through greening operations. Presentations, poster sessions, and discussions emphasized the pressing importance of sustainability.

For the Sustainable Subsea Networks team that traveled to Bangkok, SubOptic was an excellent opportunity to present our recent empirical research and explore partnerships with industry members. For us, the highlight of the event was the

SubOptic Foundation Congress on Sustainability, an event that made subsea history as the first intentional gathering of members from across sectors and around the world to discuss metrics for sustainability in the subsea cable industry. The Congress was made possible by funding and institutional support from the SubOptic Foundation and the Internet Society Foundation. It gathered industry leaders to share insights from ongoing initiatives and potential strategies for the cable networks of the future. In this article, we share the Congress discussions in detail, as its participants’ contributions will be a crucial foundation for sustainable development in the coming years.

Nicole Starosielski, Associate Pro-

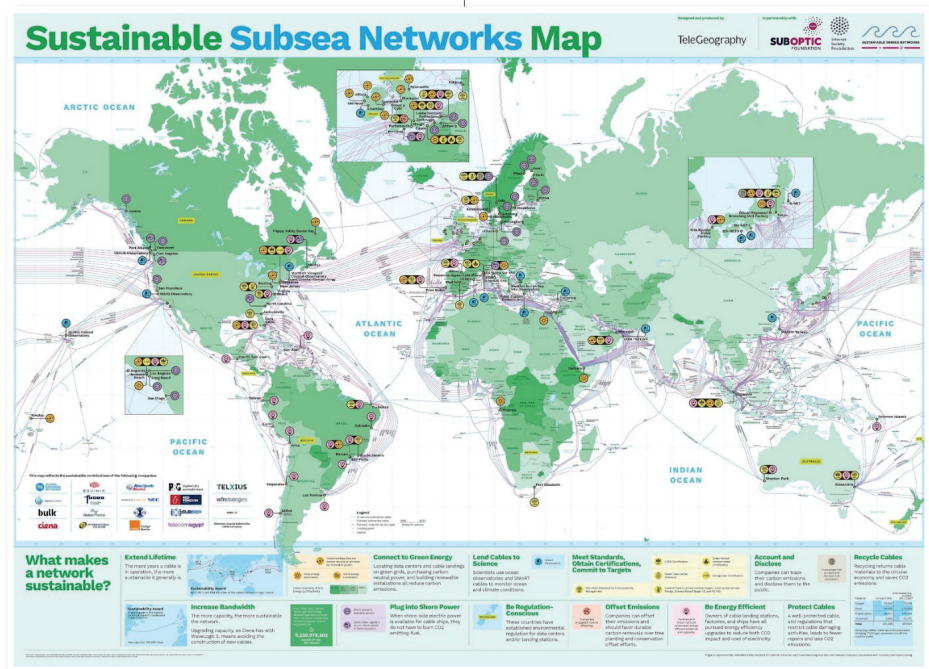
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essor at New York University as well as Principal Investigator and Industry Lead on the Sustainable Subsea Networks grant project, moderated the session and introduced ten potential sustainability metrics for discussion. Our research indicates that a set of metrics or numerical parameters is crucial given potential future pressure from new regulations globally. Data quantification and utilization will also be critical to greening the industry across all stages, from planning and manufacturing to operations and recycling: a set of metrics allows companies to establish baselines against which progress can be measured.

Dr. Starosielski revealed preliminary findings from conversations with twenty-five member companies of SubOptic and from the research team's carbon footprint assessment of a submarine cable. The session also highlighted where the best sustainable practices are taking place, showcasing the Sustainable Subsea Networks Map developed in partnership with TeleGeography.

Following this demonstration, a panel discussion followed in an open and guided format. Industry members shared existing practices and goals. Some companies have made significant progress by leveraging emerging technologies for marine surveying, employing strategies for recycling cables, and expanding the use of renewable technologies. Merete Caubet, Vice President of Sales and Business Development at Bulk Fiber Networks, emphasized the importance of thinking about sustainability efforts collectively across both data centers and subsea networks.

Caubet mentioned that Bulk Infrastructure started reporting its carbon footprint in 2020 and is committed to reducing it by 50% by 2030. She emphasized the need for a closer



The SubOptic Foundation's Sustainable Subsea Networks research initiative, in collaboration with TeleGeography and funded by an Internet Society Foundation grant, presents a sustainability map showcasing best practices and highlighting countries with national laws and policies on sustainability. [Click here for high-resolution.](#)

examination of energy use across the industry, an aspect that has seemingly been overlooked until recently (check here a recent column article we recently wrote on the topic). She stated that 90% of Bulk Fiber Networks' data centers in Europe are connected to renewable energy sources. Caubet underscored the importance of positioning assets in areas with access to renewable energy sources, and stated: "we need to improve the energy efficiency of these projects while also paying attention to small-scale data centers, where most of the processing takes place."

Ensuring the reliability and resilience of the global subsea cable network is crucial, especially given the increased data traffic during the COVID-19 pandemic. Andy Palmer-Felgate, Submarine Cable Engineer at Meta, stressed the importance of planning innovation around cut-

ting-edge technology, such as ocean energy, but also emphasized the need for a thorough examination of resilience from various angles. He stated, "access to the grid is important, but it is also essential to have a backup. If you can use a combination of direct green energy and still maintain reliability, that is fantastic." This highlights the need for a sustainable approach that balances innovation with dependability.

Brian Lavallée, Senior Director of Product Marketing at Ciena, shed light on the company's strides in implementing coherent optics within submarine networking. Over the past years, Ciena's technological progression in coherent optics has enabled the company to expand its capacity from an initial 10 gigabits per second per wavelength to an impressive 800 gigabits per second per wavelength, representing an 80-fold increase in

the span of approximately one decade. Additionally, the power per bit per second has decreased by 80%, while the space per bit per second has been reduced by 90%. “These advancements also fit into existing platforms, a trend we see among our competitors. Architectural changes have occurred as well, such as the introduction of coherent modems in submarine cables,” Lavallée explained. He also touched on the company’s foray into the software domain, where the internet and networks are becoming increasingly integrated, heralding another significant development in the industry.

Regulation emerged as a key issue to tackle in the context of recycling. Although an overall consensus on the extent of industry collaboration regarding data sharing, for instance, does not yet exist, some participants argued that establishing a principle and consensus around cable recovery and recycling as a common goal would be achievable.

Alywn du Plessis, CEO of Merteck Marine, revealed that the company began tracking its carbon footprint as early as 2015. Du Plessis stressed the array of factors to consider when weighing recycling options, including the business case, crew safety, cable types, implications for other cables in the region, and more. He posited that when a cable can be safely recovered and recycled, taking into account technical aspects and various other factors, the process is more sustainable and economically advantageous. “Even though we’ve proven that these cables can last, we can’t predict what the situation will be like in the distant future. So, whenever it’s possible to safely remove cables while considering a wide range of factors, we believe it should be done,” du Plessis said. However, he cautioned that the business case for re-



Photo of the SubOptic Foundation Congress on Sustainability chaired by Nicole Starosielski (NYU) on March 13th, 2023. From left to right: Merete Caubet (Bulk Infrastructure), Michael Constable, Dean Veverka (Southern Cross Cables), Takahiro Kashima (NEC), Andy Palmer-Felgate (Meta), Alwyn du Plessis (Merteck Marine), Emmanuel Danjou (Alcatel Submarine Networks), René d’Avezac de Moran (Fugro), Michael Clare (National Oceanography Centre), and Nigel Bayliff (Aqua Comms). Photo by Terrapin Events.

covering these cables is often precarious, with many uncontrollable factors such as commodity pricing affecting the business model. This renders the process highly challenging and necessitates further industry collaboration.

Sustainability in marine operations was a significant focus of the Congress. Fugro Singapore Marine Pte Ltd aimed to reduce its emissions by over 40% between 2018 and 2023, despite expanding its operations. René d’Avezac de Moran, Service Line Manager, introduced several methods to mitigate environmental impacts associated with subsea cable network surveys and installations. He cited the growing interest in using vessels that consume less energy or adopt greener fuels, as well as improving efficiency and speed, optimizing routes, and reducing heat generated by the vessels. d’Avezac de Moran also highlighted the recent innovation of autonomous surface vessels, which have already achieved success in other industries. He expressed enthusiasm for their adoption in compliance with more sustainable practices and expectations for reducing carbon emissions. “Adapting

these technologies to our industry and finding new markets can make a huge difference,” d’Avezac de Moran stated. “It not only benefits the environment but also creates a safer work environment for everyone involved. People are increasingly interested in these innovations, and we believe they will continue to gain traction in the future.”

Metrics for enhancing sustainability can also help drive corporate changes from within companies. Dean Veverka, CTO & VP Operations at Southern Cross Cables Limited, emphasized the importance of internally tracking carbon emissions at various stages of installation in order to identify areas for reduction and potential investment in innovation. By breaking down operations into specific components and quantifiable parameters, different teams with their own objectives can collaborate more effectively on deploying a sustainable cable system. Veverka stated, “Once we’ve gathered the necessary data, we then are to come back across teams and ask, what is our baseline? Can we improve each of those? I think that’s when discussions can help drive sustainable change.”

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The carbon emissions of the subsea cable industry are significant, but when compared to the impact of other sectors like fishing, they are relatively small. But it is not enough to simply label one industry as more harmful than another when considering sustainability. As suggested by Michael Clare, Principal Researcher at the UK's National Oceanography Centre, "we need to consider sustainability within an even broader sense." Although the industry has given considerable thought to marine sustainability, there are multiple factors related to cable installation and protection that need to be addressed. They also need to consider the increasing complexity involving governments and new regulations that are becoming stricter in the face of environmental concerns. This opens up an opportunity to consider how the industry can interact with governments to ensure sustainable use of the aquatic environment. As pointed out by Takahiro Kashima, manager at NEC Corporation, perhaps it is worth considering whether the "industry should rely on governments to control illegal activities so that private stakeholders don't need as much protection."

One concrete proposal for marine operations is the adoption of speed optimization as a practice: going the optimal speed for fuel efficiency. While in some cases reduced speed would lead to environmental benefits, Kashima cautioned that "speed optimization does not always lead to carbon reduction." If the marine installation is not completed during the workable season due to speed optimization, additional vessel mobilization could be required, which would result in additional CO2 emissions.

The shift toward a digitized, albeit decentralized, workforce was a prominent topic in sustainability discussions. Nigel Bayliff, CEO of Aqua Comms,



Attendees during the Inaugural SubOptic Foundation Congress on Sustainability. Photo by Terrapin Events.

shared insights on how his company, with teams spanning from San Francisco to Brisbane, has integrated ESG metrics into its corporate objectives. This integration has allowed for flexible work arrangements tailored to employees' individual needs. Bayliff highlighted, "We're more focused on the results of work rather than its location." He further elaborated that AquaComms' policies enable staff to work remotely from other countries for extended durations, provided it aligns with the company's overarching goals. The team convenes in person once or twice a year at conferences to maintain connections.

"Remote work is the only way we can operate effectively," asserted Bayliff. Echoing this sentiment, Emmanuel Danjou, Head of Business Development at Alcatel Submarine Networks, argued that adopting remote work has contributed to reducing the industry's overall carbon footprint. Danjou noted that his company has started to establish control centers globally, thus curtailing the need for travel. "We are currently using these centers for remote operations, which initially seemed daunting due to the nature of the tasks. However, we have experienced success in this area and look forward to expanding their usage in the future," Danjou shared.

Comprehending the role of global regulators in the industry is crucial, as licensing processes have grown increasingly complex over the past two decades due to heightened recognition of various stakeholders' involvement. For instance, Singapore's Marine Ports Authority mandates the use of specific materials to minimize the carbon footprint. Michael Constable emphasized the importance of understanding the roles and positions of regulators worldwide. "We will be forced by the regulators around the world with their own ideas on things, possibly without industry input," he cautioned.

The Congress's conclusion underscored the pressing need for industry collaboration in devising a green matrix. Failing to do so may result in companies being compelled to adhere to diverse regulations across nations, potentially without input. It could become necessary for businesses to obtain a green rating or showcase outstanding efforts in cable construction and operation to secure landing licenses. Proactively championing sustainable practices serves the industry's best interest, helping to circumvent conflicting regulatory perspectives worldwide.

Following the Congress, sustainability discussions were prominently



Attendees gathering at the closing ceremony on March 16th, 2023, at Truelcon Hall at ICOSIAN in Bangkok, Thailand. Photo by Terrapin Events.

featured throughout SubOptic 2023. Throughout the week, research talks, masterclasses, and poster sessions covered a wide range of topics, such as cutting-edge research and techniques related to SMART cables, innovative technologies in Uncrewed Surface Vehicles (USV) for marine operations, and the impact of Spatial Division Multiplexing (SDM) on subsea cables. Conversations also explored the ongoing challenges, both from engineering and regulatory/commercial perspectives, in decommissioning cables and the potential of building renewable-powered data centers to minimize the internet's carbon footprint. Notable was also the vast geographic orientation of the research spanning from South East Asia to the Middle East and North Africa and from the Nordics to the Pacific Islands.

Amidst these presentations, there was a strong sense of the need to maximize capacity for the networks of the future while reducing costs—from marine to cable manufacturing. However, it is essential to ensure that advancements in efficiency and sus-

tainability go hand in hand to prevent any negative environmental impact.

Since its inception in 1986, the SubOptic conference has witnessed how significant changes in telecommunications have shaped the world. These changes have also come with new global challenges that are becoming imperative, such as addressing climate change, tackling alarmingly rising sea levels, and ensuring more equitable access to information. As we anticipate future SubOptic conferences and other industry gatherings, it is essential to recognize the growing importance of sustainability. From adopting metrics to advocating for renewable energy, the industry can make an enormous difference in expanding critical infrastructures while leveraging collaboration. For this topic, the conference theme, “Navigating the Open Seas—Collaboration on Our Critical Infrastructure,” could not be more appropriate.

The SubOptic Global Citizen Working Group and the Sustainable Subsea Networks Advisory Board are committed to working on developing metrics for sustainability in the coming years. We

welcome new members to the Group and Board: Matthew Bowden (Red Penguin Marine), Jack Bullen (Aqua Comms), Merete Caubet (Bulk Fiber Networks), René d’Avezac de Moran (Fugro), Emmanuel Danjou (Alcatel Submarine Networks), Jas Dhooper (Aqua Comms), Salvador Jimenez-Sanchez (Red Penguin Marine), Connor Shipton (Vodafone) and Vedrana Stojanac (Ciena). We look forward to sharing our progress in two years at SubOptic 2025.

This article is an output from a SubOptic Foundation project funded by the Internet Society Foundation. **STF**



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Do you have further questions on this topic?

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