MARITIME TRANSPORTATION RESEARCH AND EDUCATION CENTER
TIER 1 UNIVERSITY TRANSPORTATION CENTER
U.S. DEPARTMENT OF TRANSPORTATION

Marine Transport: Documenting the need for value-chain collaborative approaches to achieve decarbonization

Project start: January 1, 2022
Project End date: August 31, 2023

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September 30, 2023

FINAL RESEARCH REPORT

Prepared for:
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ACKNOWLEDGEMENT
This material is based upon work supported by the U.S. Department of Transportation under Grant Award Number 69A3551747130. The work was conducted through the Maritime Transportation Research and Education Center at the University of Arkansas.

I. Project Description

The adoption of the Paris Agreement and its effective date of November 4, 2016, heralded a new era where, for the first time since global carbon goals existed, every country on Earth pledged to contribute to achieving those goals (United Nations, 2015; Savaresi, 2016). Meeting the global and U.S. commitments to the Paris Agreement, however, remains a daunting task. Contributions (emissions reductions) will be needed from every sector of the economy. Yet, too often, individual business's efforts towards carbon reduction appear to be relatively siloed, wherein each organizational entity reduces emissions within the constraints of its reliance on an external system (suppliers, customers, lenders, and more) that may be entirely dependent on carbon-intensive operations. To address this problem, a full, value chain approach to decarbonizing an industry or sector is needed (Mol, 2015; Porter, 2001). However, bringing commercial competitors together to achieve a common goal (decarbonization) raises its own set of challenges (Lund-Thomsen & Lindgreen, 2014; Kaplisnky, 2010). This report examines the work of one value chain coalition that has emerged in the North American maritime shipping sector, Blue Sky Maritime Coalition (Blue Sky or BSMC).

Blue Sky was formed in 2021 as a response to the recognition by the maritime shipping sector in the U.S. and Canada that, because of the unique features of the North American shipping industry, a regional approach to decarbonization was warranted, separate from but complementary to the ongoing work in the international arena (Blue Sky, 2022). Blue Sky currently has over 100 members representing the full maritime shipping value chain, and is focused on commercially viable pathways to achieve net-zero greenhouse gas emissions by 2050 (the stated goal of Blue Sky).

As an early example of such a coalition, the work, functioning, and outcomes of Blue Sky are important to study, as its efforts and potential for effective outcomes may be replicated across industry sectors (CPLC, 2018; Mackie, 2021). This report summarizes the methodology, approach, and findings of our study of BSMC.

II. Methodological Approach

Value chain coalitions are exceedingly rare in commercially competitive industries. We are aware of only two globally with a focus on sustainability initiatives—BSMC and Catena-X. Catena-X seeks to advance digitalization across the supply chain within the automotive industry. Their approach aims to leverage the knowledge and data of the full value chain to enable accurate carbon accounting, traceability, and standardization of data and data transfer to increase usability and reliability (Catena-X, n.d.).

BSMC is a North American-focused, non-profit coalition that brings together not only the full corporate value chain within the maritime shipping sector, but a host of knowledge, technology, and other partners with the stated goals of accelerating the achievement of net-zero greenhouse gas emissions in the maritime shipping sector by 2050. Vanderbilt University

joined as a member of Blue Sky and engaged deeply with the organization to support the decarbonization mission of the group and to study its organization, membership and functioning.

Initially, we designed a survey, administered by Blue Sky to its members, comprised of vessel owners and operators, vessel manufacturers, participants in the fueling supply chain, knowledge partners, shipping customers, technology providers, and others. The survey was intended to elicit information regarding reasons for joining, the types of individuals who engaged in the day-to-day work (e.g., what level of the company and experience), and the benefits each member saw in engagement with the organization. The survey also gathered information regarding the committees or work streams within BSMC and the relative merits participants saw in their engagement with Blue Sky. We asked for concrete examples of how members had benefited from their association with Blue Sky, as well as views of the largest barriers to decarbonization facing the industry generally and the North American shipping industry in particular. Thirty seven (37) completed surveys were received, representing over 30% of Blue Sky members.

Separately, one-on-one interviews were conducted with 22 individual members of Blue Sky. Interviewees included representatives of both the leadership board of Blue Sky and general members—including those who participate regularly in Blue Sky workstream activities and those whose direct involvement in Blue Sky is less frequent. The interview participants included major shipping company CEOs, early career shipping professionals, attorneys, technology developers, and others. Consequently, the full value chain of maritime shipping reflected in BSMC membership was well represented in the interview cohort.

We followed a semi-structured interview format designed to allow for open-ended discussion as well as targeted information seeking questions. Topics included:

a. Length of membership in the Blue Sky Maritime Coalition;
b. Types of activities/tasks the interviewee was involved in on behalf of BSMC;
c. Examples of lessons learned (processes, approaches, etc.) that have been incorporated into the interviewee's organization from involvement in BSMC;
d. Whether BSMC may/may not be an important approach to decarbonizing marine shipping;
e. Direct interaction with the value chain members outside the organization's sector;
f. Needed or missing sectors that are essential to decarbonization;
g. Most significant barriers to decarbonization and available solutions;
h. Viable solutions if not economically-constrained;
i. Where BSMC should focus its efforts to drive decarbonization;
j. Why the value chain approach is important;
k. Whether competition is a barrier to decarbonization in a value chain approach;
l. Pros and cons of (i) membership in BSMC and (ii) value chain approach to decarbonization; and

m. Research needed (if any) to support decarbonization goals.

III. Results and Findings

The study produced a number of important insights into the functioning and impact of a coalition such as BSMC.

1. Leadership. Overall, BSMC as an organization is successful as measured by the number of members it continues to attract and the view of most members that they see direct and concrete benefits from their involvement. Committed and experienced leadership is one element that was observed as critical to the success of BSMC. The President & CEO, Vice President & Chief Strategy Officer, and Director of Operations Officer are all highly experienced and personally engaged in overseeing the operation and direction of the organization. Commitment to BSMC at the highest levels of member companies—as evidenced by, for example, CEOs of major shipping companies holding positions on the Blue Sky Board of Directors—sends a message that the mission of BSMC is, as one interviewee described it, "personally important to the leader" of the company. Early career professionals in those same companies reported that seeing their own leaders committed to Blue Sky was very important to their motivation for engagement with Blue Sky and personal investment in achieving decarbonization goals.

2. Common Goals. Members overwhelmingly shared a common view that the maritime shipping industry must decarbonize. Not only is it likely that rules will require it (even if the timing is uncertain), but also that there are already market forces at work driving such decarbonization. BSMC members had shared goals of retaining ownership of the direction and pace with which decarbonization occurs. Members also acknowledged a need to assure that the value chain supports the pathways ultimately selected, noting that interaction and collaborations are critical to assuring commercially viable decarbonization can be achieved.

3. Identifying opportunities. The coalition approach provides a mechanism to identify and share opportunities that may benefit the entire industry, and likely would not be known to most members in the absence of the coalition. One salient example is the existence of funding opportunities. Blue Sky and its members actively search for such opportunities that can aid members in advancing decarbonization strategies, and share this knowledge across the coalition. Such opportunities range from small vessel-specific, clean-fuel upgrades to major collaborative grant initiatives. This aspect of the coalition is particularly important and adds significant value to the potential of the industry to decarbonize. As many funding opportunities require or prioritize collaborative applications between diverse entities, absent a coalition such as BSMC, finding such partners would be challenging, especially where the needed partners may be direct commercial competitors. In addition, many members (such as private, for-profit companies) do not have the experience or expertise in searching for and applying for this type of funding—Blue Sky can fill an important gap in that regard. Because many companies in the shipping sector are small, this approach offers huge advantages for companies who would not

have the resources to identify or respond to such opportunities individually. Blue Sky's monthly speaker series and workstream meetings also become ongoing opportunities to share knowledge.

4. Representation across value chain. The maritime shipping value chain is well represented within the membership of BSMC. This includes fuel providers, electric and battery technology developers, vessel owners and operators, finance and legal support services, among others. The only vessel category that appeared to be lacking representation was major cruise ship operators. The wide representation of stakeholders within BSMC means that the entities needed to drive change towards decarbonization are regularly working together towards that goal.

5. Commercial competition. Survey respondents did not reveal any barriers with respect to BSMC's goals or functioning based on commercial competition. The group is keenly aware of the issues, and begins every meeting with antitrust statements to make clear that anti-competitive behavior must be avoided. One potential concern is that as shipping customers begin to evaluate their own value chain emissions (such as Scope 3 emissions which include the emissions associated with transporting their goods to market) shipping companies able to decarbonize their operations are likely to enjoy a commercial advantage. Such customers may prefer to contract with shipping companies they view as achieving more decarbonization success (potentially providing a competitive advantage to operators that can reduce vessel greenhouse gas emissions faster or more efficiently than competitors). Nevertheless, these competitive concerns do not appear to be negatively impacting the progress of Blue Sky's mission. Rather, the membership's views reflect a concern that the entire value chain on which each depends must transform in order for all companies to be successful. One manifestation of this cooperative view is the development by Blue Sky of approaches to developing emissions inventories for use by any member, and the free exchange of resources and information to assist in progress towards decarbonization goals.

6. Unintended Co-Benefits. Our work revealed two interesting co-benefits of this coalition. Because BSMC works through topical workstreams, both experienced C-suite executives and early career professionals are interacting with each other and gaining important knowledge from across the value chain in novel ways that would be unlikely otherwise. Young professionals regularly participate in meetings with leaders from their own and other companies, learning directly about top issues, challenges, and opportunities for the direction of their industry. Concurrently, C-suite executives are regularly interacting with and better understanding the operations of companies throughout the value chain. We coin this "value chain knowledge", providing executives with critical and more detailed insight into the specific direction of technologies, fuels, and other factors on which they depend. Outside of coalitions like Blue Sky, for example, it might be rare for the CEO of a shipping company to regularly meet with counterparts of battery storage companies or leaders from companies that develop emission monitoring technologies.

Overall, given the unique nature of climate change, Blue Sky affirms the need for value-chain coalitions across industry sectors to address this challenge. As each participant within the value chain in any industry sector is dependent on the supply and customer chains in which they operate, it is exceedingly difficult to make changes that are not supported by these external systems.

IV. Impacts and Benefits of Implementation

The project has substantially advanced the study and understanding of the workings, structure, and impact of value chain coalitions. Such coalitions are likely to be critically needed across all economic sectors as the global economy works to decarbonize. Accordingly, studies such as this can provide important information for similar emerging coalitions.

In addition, the benefit of this work is being recognized through dissemination of the study results. The work reflected in this report has already been presented at several conferences and events, including the following:

- in Sharm el Sheikh, Egypt in November 2023 at the 27th Conference of the Parties (COP27) to the United Nations Framework Convention on Climate Change. The study was presented as part of a Side Event selected in a competitive process by the United Nations, and separately at an event selected by the U.S. State Department (also in a competitive process);
- at the Transportation Research Board Annual Meeting in January 2023;
- in June 2023 at the Seventh Biennial Conference on the Marine Transportation System Innovative Science and Technologies Toward Greater Sustainability;
- at a webinar series for Sandia National Laboratory on the role of water in a carbon neutral future (April 2022); and
- at a webinar organized by Wartsila in June 2023.

We are also in the process of preparing a paper based on this work that will be submitted to a peer reviewed journal for publication. Any updates will be provided to MarTREC.

V. Conclusions

Major conclusions are set forth in Section III, above. Value chain coalitions such as Blue Sky are rare but likely to be increasingly needed as complex and connected economic sectors move to reduce the carbon intensity of the economy.

No single fuel or propulsion system is expected to form the basis of the decarbonization strategy across the full maritime shipping sector. Accordingly, a wide range of companies and stakeholders will need sustained structures, frameworks, and approaches to drive collaboration—Blue Sky serves an important role in this regard as it is developing and

implementing such frameworks. Further study of Blue Sky, and of other existing and emerging value chain coalitions focused on sustainability, is needed to share lessons learned and to demonstrate the benefits of such coalitions to advancing decarbonization goals.

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