A UNIFIED VISION FOR U.S. MARITIME POWER

FROM IMMEDIATE FLEET NEEDS TO LASTING INDUSTRIAL STRENGTH

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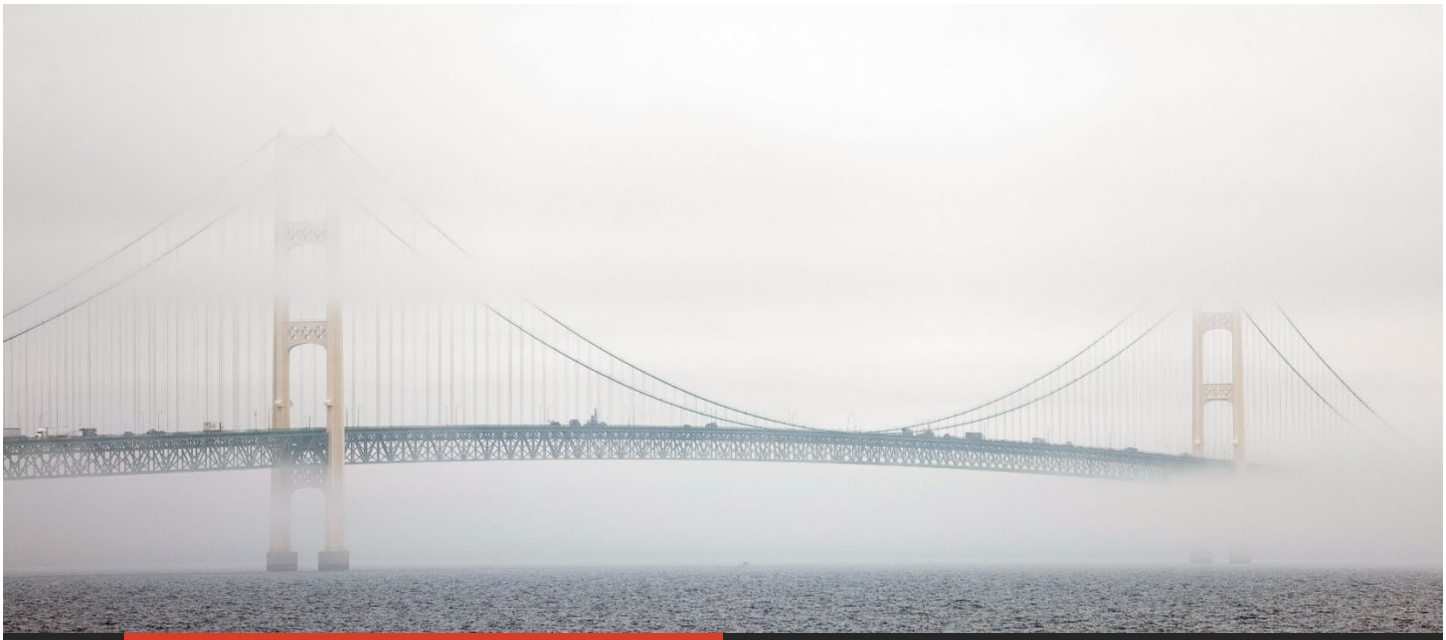
GREAT LAKES MARITIME INITIATIVE



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Paper Title: A Unified Vision for U.S. Maritime Power: From Immediate Fleet Needs to Lasting Industrial Strength

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EXECUTIVE SUMMARY

A bipartisan effort is underway to revitalize U.S. commercial shipping and shipbuilding in response to China's growing maritime dominance. Three major policy initiatives drive this effort: the ongoing Section 301 trade investigation, which imposes fees on Chinese vessels; the April 2025 Restoring America's Maritime Dominance Executive Order, which requires a Maritime Action Plan by November 2025; and the bipartisan SHIPS for America Act, which targets 250 U.S.-flagged vessels within ten years. These policy initiatives offer hope for sustained, multi-administration support, but their success hinges on corporate willingness to commit to long-term, capital-intensive investments.

Our analysis indicates that the U.S. needs at least 80 new ships over the next 15 years, requiring a potential increase in production from zero oceangoing ships last year to 15 annually within five years. More ambitious proposals call for up to 1,120 U.S.-flagged vessels to support prolonged international conflict while maintaining economic competitiveness. Global maritime trends, driven primarily by decarbonization, present strategic opportunities for U.S. leadership in sustainable marine fuels, advanced nuclear propulsion, artificial intelligence, digitalization, and autonomous technologies – areas where American innovation can create competitive advantages.

Success requires three complementary strategies: developing a dual-use industrial base that shares supply chains between naval and commercial shipbuilding; technology leapfrogging through advanced manufacturing, robotics, and next-generation maritime systems; and alliance-based approaches, partnering with key countries like Korea, Japan, Canada, and Europe, to leverage their production capacity and expertise, including technology transfer.

Three priority actions are identified:

- **Invest in rigorous analysis and assessments** to identify viable strategic commercial fleet pathways, considering domestic production, allied procurement, and reflagging approaches.
- **Prioritize passage of the SHIPS for America Act** to secure a comprehensive, well-funded approach that includes support for maritime innovation at scale.
- **Engage educational institutions** to build a holistic strategy integrating research, workforce development, and policy activities.

These coordinated steps provide a necessary first step for strengthening America's strategic commercial fleet, revitalizing U.S. shipbuilding, and establishing leadership in advanced maritime technologies.

Invest in rigorous analysis and assessments

Prioritize passage of the SHIPS Act

Engage educational institutions

INTRODUCTION

A bipartisan effort is underway to revitalize U.S. commercial shipping and shipbuilding in response to China's fleet of over 5,000 ocean-going vessels compared to fewer than 200 for the U.S. An April 2025 Executive Order requires a Maritime Action Plan by November 2025, echoed by Congress's Shipbuilding and Harbor Infrastructure for Prosperity and Security (SHIPS) for America Act, which calls for 250 U.S.-flagged vessels within ten years. Alongside this, a Section 301 investigation into China's maritime trade practices continues. These efforts aim to rebuild the U.S. commercial shipbuilding base, enhancing competitiveness, strengthening national security, and addressing the Navy's strained industrial base and workforce shortages.

Despite consensus on the need for a stronger fleet, there is limited guidance and details on how to achieve the desired objectives, including uncertainties related to the number and types of vessels needed, expected production timelines, and approaches to allied collaboration.[1,2,3] Questions also extend to how the U.S. can leverage its technological strengths in nuclear propulsion, AI, autonomy, and advanced manufacturing to build competitive advantages in specialized segments, such as LNG carriers and icebreakers. Enhancing maintenance, retrofit, and conversion capacity, while strengthening the marine equipment supply base, will also be essential for both naval and commercial demands.

The key question is how to rapidly and cost-effectively expand the U.S. commercial fleet while building a resilient shipbuilding industry, despite some debate over its necessity for maritime power.[1,2] This paper reviews current proposals in a global and historical context, outlines immediate actions, and argues that reindustrializing shipbuilding in a developed nation will require innovative approaches. It provides a foundation for further discussion while deferring a deeper examination of workforce, shipbuilding capacity, and marine supply chain issues that are critical to long-term maritime security and economic strength.

Soo Locks, Sault Ste Marie

PROPOSALS TO STRENGTHEN THE U.S. COMMERCIAL FLEET

The U.S. has lost its commercial fleet and shipbuilding industry, while China has become the world's largest shipbuilder, expanded its commercial and naval fleets, and controls key ports and equipment. This imbalance leaves the U.S. with a strong, but strained Navy and limited commercial capacity, raising concerns over economic coercion and wartime support. In response, bipartisan efforts are advancing through three major actions: the ongoing Section 301 trade investigation, Trump's April 2025 Maritime Dominance Executive Order, and the SHIPS for America Act, which together begin shifting from defining strategic needs to setting concrete fleet targets.

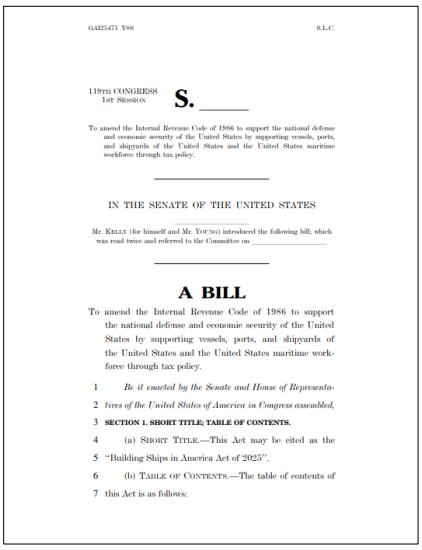
Section 301 unfair trade practice allegations and response

The U.S. Trade Representative (USTR) Section 301 investigation into China's targeting of the maritime, logistics, and shipbuilding sectors for dominance represents a comprehensive trade enforcement action that began under the Biden administration in 2024 and has continued under the Trump administration. Following an extensive year-long investigation that included hundreds of public comments and multiple hearings, USTR released its final determination in January 2025, concluding that China's practices were "unreasonable or discriminatory" and warranted responsive action. The investigation resulted in a phased implementation of fees on Chinese-owned, Chinese-operated, and Chinese-built vessels beginning October 14, 2025, with fees starting at $50 per net ton for Chinese operators and $18 per net ton for Chinese-built ships, alongside restrictions on LNG transport and proposed duties of up to 100% on ship-to-shore cranes. USTR has continued to refine these measures through ongoing public comment processes, including modifications proposed in June 2025, while monitoring the effectiveness of these actions in addressing what it characterizes as nearly three decades of Chinese industrial policy targeting maritime sector dominance.

Restoring America's Maritime Dominance Executive Order

The Restoring America's Maritime Dominance Executive Order, signed by President Trump on April 9, 2025, establishes a comprehensive federal strategy to revitalize the U.S. commercial shipbuilding industry and maritime workforce. The order mandates the creation of a Maritime Action Plan within 210 days, coordinated by the National Security Advisor in collaboration with multiple cabinet departments, to rebuild the Maritime Industrial Base using Defense Production Act authorities, private capital investment, and targeted financial incentives. Key provisions include enforcing Section 301 trade actions against China's maritime sector dominance, establishing Maritime Prosperity Zones modeled after Opportunity Zones, creating a Maritime Security Trust Fund for reliable program funding, expanding mariner training and education programs, modernizing the U.S. Merchant Marine Academy, and implementing procurement reforms. The order

also addresses regulatory barriers, Arctic waterway security, and the collection of harbor maintenance fees to prevent cargo circumvention through Canada and Mexico, as well as coordination with allies to align trade policies. These measures are aimed at ensuring adequate U.S.-flagged commercial vessel capacity for national security purposes while enhancing international trade competitiveness.



GAH25471 Y8S S.L.C.

119TH CONGRESS 1ST SESSION **S.** _____

To amend the Internal Revenue Code of 1986 to support the national defense and economic security of the United States by supporting vessels, ports, and shipyards of the United States and the United States maritime workforce through tax policy.

IN THE SENATE OF THE UNITED STATES

Mr. KELLY (for himself and Mr. YOUNG) introduced the following bill; which was read twice and referred to the Committee on _____

A BILL

To amend the Internal Revenue Code of 1986 to support the national defense and economic security of the United States by supporting vessels, ports, and shipyards of the United States and the United States maritime workforce through tax policy.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE; TABLE OF CONTENTS.

(a) SHORT TITLE.—This Act may be cited as the "Building Ships in America Act of 2025".

(b) TABLE OF CONTENTS.—The table of contents of this Act is as follows:

SHIPS for America Act

The SHIPS for America Act, reintroduced in April 2025 by bipartisan legislators including Senators Kelly and Young, represents comprehensive legislation to revitalize the U.S. maritime industry by establishing a fleet of 250 U.S.-flagged vessels within 10 years. The Act establishes White House-level coordination through a Maritime Security Advisor, who leads an interagency Maritime Security Board, and creates a Maritime Security Trust Fund for dedicated maritime program funding. Additionally, it implements the Strategic Commercial Fleet Program, which includes annual support payments to make U.S.-built, U.S.-flagged vessels commercially competitive in international commerce. Key provisions include investment tax credits for shipyard investments, enhanced cargo preference requirements that mandate U.S. government cargo to be moved on U.S.-flagged vessels, workforce development through Centers of Excellence, and loan forgiveness programs for mariners.

Additionally, there are provisions for streamlined environmental reviews for shipyards and duties, fees, or penalties on vessels from foreign countries of concern, including China. The legislation also expands the U.S. Center for Maritime Innovation, requires a percentage of Chinese imports to be carried on U.S. vessels by 2030, and creates Maritime Prosperity Zones to incentivize domestic investment in waterfront communities, representing what sponsors describe as "the most ambitious effort in a generation" to rebuild America's maritime industrial base.

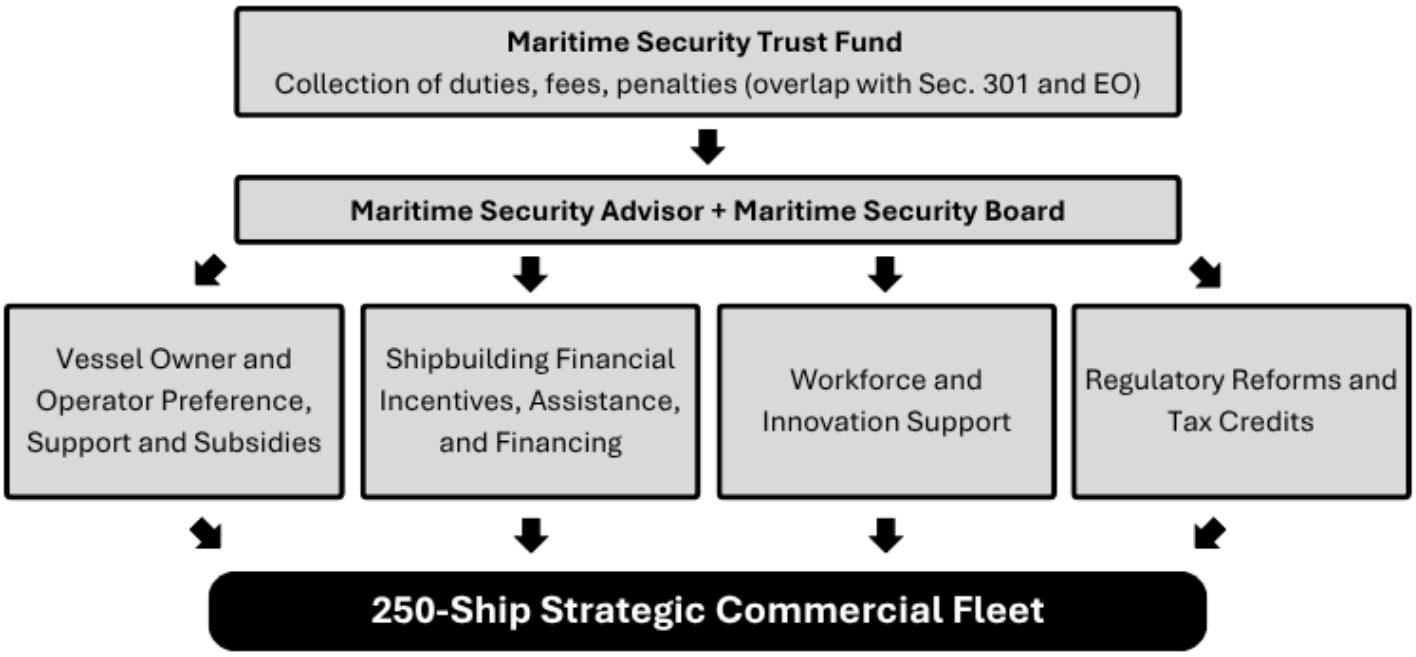


Figure 1: SHIPS for America Act overview

SETTING DETAILED FLEET TARGETS

The three proposals described above outline broad objectives but lack detailed fleet targets, which are essential for analyzing how to achieve them. An assessment of these proposals and other sources was conducted to identify practical, detailed fleet targets needed to strengthen the U.S. strategic commercial fleet. The first step is clarifying key questions:

- How many, what types, and sizes of vessels are needed for peace, conflict, and war?
- By when and where should they be built?

The SHIPS for America Act offers initial guidance but lacks detail on vessel types and sizes. Using trade volumes (TEUs, LNG, crude exports, and agriculture), estimates indicate that at least 80 ships must be built over 15 years, increasing potential U.S. production from zero to 15 ships annually within five years. Table 1 provides a summary of the analysis.

Table 1: SHIPS for America Act analysis of the number of U.S.-built vessels needed

SHIPS Act Section	# of Vessels (Today)	Target Vessels	# of Vessels Needed	Type of Vessels	Target Date
Section 401: Strategic Commercial Fleet - A fleet of active, commercially viable, militarily useful vessels	178	250	72	All	2030
Section 404: Tanker Security Fleet	10	15	5	Tanker	2034
Section 403: Cable Security Fleet	2	3	1	Cable layer	
Section 411: United States Government Cargo - certain government cargo must be transported on U.S.-flagged vessels	50%	100%		Includes ROROs	
Section 414: Financing the Transportation of Agricultural Commodities		50%	2	Bulk carrier	2040
Section 415: Importation from China on American ships - Goods imported into the United States from a foreign port must be transported on U.S. vessels		10%	44	Container	2034
Section 419: Energizing American Shipbuilding - vessels built in the U.S. transport 15% of LNG exports		15%	15	LNG carriers	2043
Section 419: Energizing American Shipbuilding - 10% of crude oil exports		10%	18	Oil tankers	2035

Other sources propose more ambitious goals. *Zero Point Four* calls for a 1,120 U.S.-flagged "future competitive" fleet (up from around 180 militarily useful vessels today) that would support a prolonged international conflict while maintaining domestic economic competitiveness, with:

- 1,000 support ships (container ships, roll-on, roll-off (RORO), bulk carriers) – currently have around 180
- +100 tankers (oil, LNG, and liquid transport) – currently have fewer than 10 in the Tanker Security Fleet and a total of around 50 U.S.-flagged tankers
- +20 specialty ships (icebreakers, subsea inspection vessels, heavy lift and salvage vessels) – at least five icebreakers needed with current access to three, including the recent conversion of the commercial icebreaker Aiviq, and 15 specialty vessels, with only three cable-laying and repair ships available

Returning from Ebb Tide recommends doubling the Maritime Security Program (MSP) fleet from 60 to 120 vessels and the Tanker Security Program (TSP) from 10 to 20. The MSP fleet consists of roughly half container vessels and half ROROs or heavy-lift platforms. The TSP is currently capped at 10 ships, and when combined with the approximately 50 U.S.-flagged tankers, it is still short of the requirements for more than 86 tankers needed to support a conflict, as outlined in a 2020 GAO report.[6]

The SHIPS for America Act and other sources provide a general sense of fleet numbers and types but lack clarity on timelines and approaches. Meeting near- and mid-term needs will require considering not only U.S. shipbuilding but also allied production, vessel purchases, and reflagging. To move forward, it is essential to determine the best possible pathways, supported by clear fleet compositions, scenarios, and timelines. This effort must also account for the global maritime landscape and the evolving future of commercial shipping, ensuring the U.S. can identify and capitalize on strategic opportunities.

TAKING ADVANTAGE OF GLOBAL OPPORTUNITIES

For the United States, global maritime trends and actions present a strategic opportunity to establish leadership in emerging maritime technologies while building domestic industrial capacity that can serve both national fleet needs and international markets.

Global maritime trends

The global maritime industry is facing a major inflection point as it seeks to decarbonize shipping by 2050, alongside advances in digitalization and autonomy. These shifts present both the sector's greatest challenge and its most significant opportunity, redefining how vessels are designed, built, and operated.

Decarbonization

The International Maritime Organization's (IMO) revised 2023 Greenhouse Gas Strategy requires international shipping to reach net-zero emissions by around 2050, with interim targets of at least 20% reductions by 2030 and 70% by 2040 compared to 2008 levels, and a minimum 5% share of zero or near-zero emission fuels by 2030. Formalized through the IMO Net-Zero Framework approved in April 2025, this would mark the first global, mandatory emissions limits and greenhouse gas pricing regime for an entire sector. Despite the recent delay in adoption, the framework is reshaping the maritime value chain, with the sustainable marine fuel market projected to surge from $20 billion in 2025 to $730 billion by 2034, reflecting both the scale of transformation required and the opportunities for early movers.[7]

Digitalization

Digitalization is transforming maritime operations by integrating advanced visualization, artificial intelligence (AI), and digital twin technologies to enhance efficiency, safety, and decision-making. Augmented and mixed reality tools enable remote inspection and immersive training by overlaying real-time sensor data onto virtual asset models, reducing downtime and improving crew preparedness. AI

and machine learning analyze vast streams of operational data to support predictive maintenance and optimize voyage planning. Meanwhile, digital twins – virtual replicas of vessels or components – provide continuous, simulation-driven insights into performance and remaining life. These interconnected technologies create a data-rich ecosystem that empowers shipowners, ports, and regulators to make informed decisions, streamline workflows, and reduce risk across the maritime value chain.[8]

Autonomy

Autonomous functions, underpinned by advances in cloud and edge computing, AI, and ease of connectivity, are poised to redefine vessel operations and crew roles.[8] Initial applications focus on automating high-risk or repetitive tasks, such as hull inspections via remote drones and machinery monitoring, enhancing safety and operational consistency. As algorithms, sensors, and communication networks mature, fully unmanned ships operating in coordinated fleets will become feasible, with real-time AI-driven formation control for fuel-efficient transits and automated decision support enabled by self-learning digital twins. Scaling autonomy will require updated standards, cybersecurity measures, and human-in-the-loop oversight to ensure resilience and ethical deployment, presenting a strategic opportunity for the U.S. to lead in next-generation maritime autonomy.

The future of commercial ship design and operation

Global maritime trends, primarily driven by decarbonization, are transforming the design and operation of commercial ships, influenced by the combined forces of regulation, technology, and market dynamics. Regulatory measures are not only becoming stricter but also more complex, creating direct compliance obligations for shipowners while sending indirect market signals that shape investment and operational strategies. Technical solutions are emerging rapidly, ranging from improved energy efficiency technologies to entirely new fuel systems, yet they remain at varying levels of readiness, integration complexity, and commercial viability. At the same time, owners and operators must weigh uncertain energy supply chains and volatile fuel pricing, making business decisions deeply interdependent across shipowners, ports, cargo owners, and builders. This dynamic can be understood as a ship design cause-and-effect chain (Figure 2).

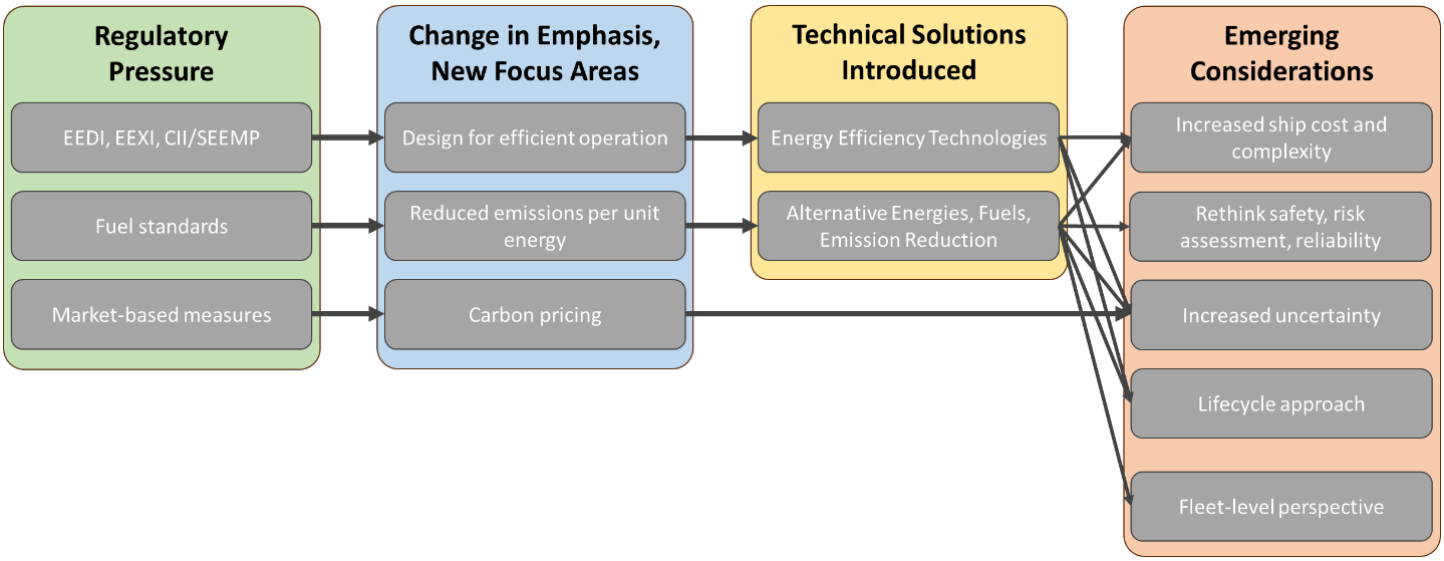


Figure 2: Maritime decarbonization ship design cause and effect chain[9]

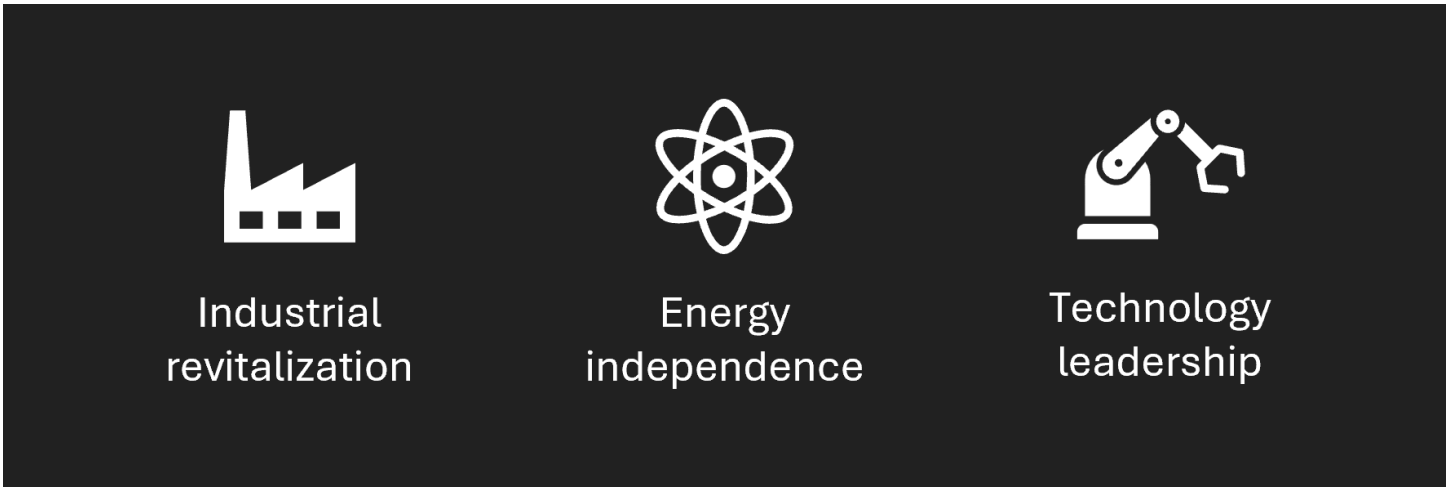
Regulatory pressures initially create new compliance requirements, shifting design objectives toward greater efficiency and reduced emissions. These shifts stimulate the adoption of technical solutions, such as alternative fuels, wind-assisted propulsion, or onboard carbon capture, many of which introduce additional risks tied to immaturity, integration challenges, or uncertain long-term viability. As these technical risks accumulate, they compound into commercial uncertainty, forcing trade-offs in vessel performance, lifecycle costs, and competitiveness. Instead of a linear design problem, the result is an expanding decision space in which uncertainties multiply with each stage, where evolving regulations reset compliance baselines, new technologies carry both risk and reward, and strategic decisions directly depend on how other maritime stakeholders respond.

Methanol- and ammonia-fueled vessels are emerging as leading pathways for decarbonizing deep-sea oceangoing vessels, with the U.S. well-positioned to lead in sustainable marine fuel production. At the same time, energy efficiency technologies provide near-term solutions as fuel infrastructure expands. This transformation is driving demand for vessel retrofits, major port investments in fuel bunkering, and shifts in business models as cargo owners pay premiums for low-carbon services and operators adopt cleaner technologies. At the same time, the integration of advanced digital and autonomous systems into ship design and construction offers new ways to manage uncertainty, reduce costs, and enhance efficiency, providing U.S. shipbuilders with potential competitive advantages in a low-emission, highly digitalized future.

Strategic implications for the U.S.

Maritime decarbonization represents a pivotal opportunity for U.S. industrial competitiveness and energy security, requiring a coordinated effort across technology development, manufacturing capacity, and market deployment. Success depends on tackling the entire maritime supply chain, from fuel production to port infrastructure to workforce development, making domestic shipbuilding and conversion capabilities critical to maintaining global competitiveness during this energy transition.

Given the global nature of shipping, U.S. leadership hinges on strengthening domestic capacity while fostering international cooperation through demonstration corridors, technology partnerships, and the development of global standards. Aligning with broader strategic goals of industrial revitalization, energy independence, and technological leadership, the challenge extends beyond regulatory compliance to capturing economic growth from reshaping global maritime commerce. For the U.S., the fundamental task is positioning itself to lead and benefit from this transformative shift in the maritime sector.



BUILDING A RESILIENT COMMERCIAL SHIPBUILDING INDUSTRY

After addressing the immediate need to strengthen the strategic commercial fleet, focus should shift toward building a resilient U.S. shipbuilding industry through long-term planning and investment. This requires determining which vessel types sustain competitiveness, whether to pursue high-value marine products or leverage U.S. technology leadership, identifying global opportunities, and strengthening collaboration with international partners while aligning U.S. capabilities with both domestic and global needs.

Reindustrialization challenges

Other nations have followed distinct pathways to build global shipbuilding capacity, often leveraging structural advantages unavailable to developed economies like the U.S. Japan rose to leadership in the 1950s through strong government support, the modernization of its shipyards, and the adoption of efficient production methods, while South Korea rapidly expanded from a small coastal industry in the 1960s to hold over a third of global vessel completions by 2013, thanks to coordinated state investment, policy backing, and technology transfer. China's dominance emerged from aggressive state-capitalist strategies, including massive subsidies, strategic consolidation under the China State Shipbuilding Corporation, and targeted acquisition of foreign technology, making it the world's largest shipbuilder. Meanwhile, Europe pursued a specialized strategy focused on high-value segments such as cruise ships, offshore platforms, and research vessels, sustained through collaborative R&D and modular design to remain competitive despite higher costs. More recently, developing countries such as Vietnam and the Philippines are building their shipbuilding capacity by leveraging low labor costs, state-led financing, and international partnerships, thereby positioning themselves as emerging players.[10]

Hanwha Philly Shipyard, formally Aker Philadelphia Shipyard

By contrast, the U.S. confronts fundamental structural disadvantages in reindustrializing commercial shipbuilding. High labor costs, stringent regulations, and strong unions limit flexibility and inflate production costs, while aging shipyard infrastructure and legacy supply chains impede the adoption of modern, efficient production methods. The U.S. domestic market is small and protected, which restricts economies of scale compared to export-driven competitors. Additionally, private-sector capital demands short-term returns that conflict with the long-term strategic investments required for shipbuilding. Political and economic factors, including free-market ideology, uncertain Congressional funding, and trade rules, further constrain the use of industrial policy tools that other countries employed successfully. Combined with existing global overcapacity and significant technological gaps, these constraints make it far more difficult for the U.S. to replicate the state-driven approach. These low-cost industrialization models enabled others to dominate the global shipbuilding industry.

Strategic approaches

Reindustrializing U.S. commercial shipbuilding requires innovative policies tailored to American conditions and grounded in proven approaches from the past. Success will depend on leveraging U.S. advantages in naval demand, technology, and allied partnerships while addressing structural disadvantages through sustained political commitment, substantial investment, and creative policy design suited to late-stage reindustrialization in a globally competitive market.

Dual-use industrial base

Expanding U.S. commercial shipbuilding alongside naval construction can strengthen a dual-use industrial base by sharing supply chains, standardizing components, and sustaining a skilled workforce. Commercial demand helps stabilize production, smooth supply chain needs, and maintain critical trades, while also mitigating risks from cyclical naval funding. This diversified order base prevents workforce attrition, supports talent development through training, and ultimately reduces costs and delivery times for both commercial and naval projects.

A dual-use industrial base presents a range of opportunities – from auxiliaries like the T-AKE dry-cargo ship, where co-production with commercial vessels and foreign shipyards has proven valuable, to limited potential for nuclear submarines or aircraft carriers, which follow distinct standards such as SUBSAFE. Naval combatants like destroyers dedicate about half their costs to government-furnished combat systems, with shipyards focusing on hull, mechanical, and electrical work.[11] Some synergies exist, such as between amphibious assault vessels and cruise ships that share complex, volume-limited designs, as seen in Italy and France. Yet major differences in materials, production complexity, regulations, and design philosophies remain. Bridging these divides requires harmonized standards, joint R&D, flexible workforce training, and innovative contracting that balance both sectors' needs while addressing intellectual property and cost-accounting challenges.

Technology leapfrogging

Technology leapfrogging presents an opportunity for the U.S. to regain competitiveness in shipbuilding by adopting advanced manufacturing and next-generation technologies that surpass traditional production methods. Despite limited commercial shipbuilding capacity, the U.S. can leverage its strengths in software, venture capital, and innovation by fostering partnerships between allied shipbuilders and

American technology companies.[12] This approach would bridge the disconnect between the U.S. innovation economy and global shipping while enhancing productivity, efficiency, and quality across the maritime sector.

Key areas of technological leadership include advanced nuclear propulsion, AI, digitalization, autonomy, and electrification. Small modular nuclear reactors could enable long-endurance, zero-emission shipping, while AI and digital twins optimize vessel performance, predictive maintenance, and real-time decision-making. Maritime autonomy promises safer, more efficient operations while reducing crew demands, and electrification via hybrid and battery systems provides near-term emission reductions for short-sea and auxiliary operations.

Advanced manufacturing methods are central to this leapfrogging strategy. Robotics, additive manufacturing, and modular ship assembly can alleviate labor constraints, enhance precision, and reduce costs, helping U.S. yards overcome structural disadvantages. Combined, these emerging technologies could allow the U.S. not only to catch up with global shipbuilding leaders but also to set new standards, ensuring both national security and long-term economic competitiveness.

Alliance-based approach

Alliance-based approaches provide the U.S. with valuable opportunities to accelerate fleet modernization, strengthen industrial capacity, and access advanced maritime technologies. Partnerships with Korea and Japan offer surge capacity, maintenance and repair options, and critical technology transfers. At the same time, joint development programs allow cost-sharing and ensure U.S. access to next-generation capabilities. The ICE Pact with Canada and Finland further demonstrates how trilateral cooperation can expand into areas like workforce development, research, and production, offering a blueprint for broader alliance-based models. An October 10, 2025, MOU between the U.S. and Finland formalizes an agreement to build four icebreakers in Finland, followed by seven in the U.S.

Significant challenges remain, however, including the U.S. Navy's tendency toward design "gold-plating," which undermines cost and schedule efficiency, as seen with the Constellation-class frigate, which reportedly retained less than 15% similarity to the original design, down from a planned 85%. Regulatory barriers, such as the International Traffic in Arms Regulations (ITAR) and Committee on Foreign Investment in the United States (CFIUS) reviews, as well as technology transfer restrictions, also complicate cooperation, even for routine exchanges.[13] Without careful policy design, these hurdles risk limiting the benefits of allied engagement.

Still, momentum is building through foreign investment in U.S. shipyards. Italy's Fincantieri operates successfully in the U.S., South Korea's Hanwha has acquired Philly Shipyard with a major expansion plan, and HD Hyundai is pursuing acquisitions and joint ventures. Japanese firms are also strengthening ties through technology partnerships and component supplies. To maximize long-term benefits, the U.S. will need strategic policy frameworks that strike a balance between national security and foreign participation in its maritime sector.

When integrated with dual-use development and technology leapfrogging, alliance-based approaches offer a powerful complementary strategy. By focusing U.S. resources on high-value differentiation in areas like autonomy, nuclear propulsion, and AI, while leveraging allied production capacity and expertise, this model distributes costs, reduces risks, and enhances competitiveness in both military and commercial markets.

A CALL FOR STRATEGIC ACTION

The United States stands at a pivotal moment in advancing its maritime strategy, with preliminary frameworks pointing the way but requiring deeper analysis, strategic investment, and stronger alliances to realize their potential. Building a resilient commercial fleet and revitalizing shipbuilding requires comprehensive planning tools, such as techno-economic modeling developed through a University of Michigan's Bold Challenges Initiative project,[14] to evaluate pathways across domestic production, allied procurement, and reflagging options under varied peacetime and conflict scenarios. Since up to 80% of a vessel's value can be derived from intermediate inputs such as steel, electronics, and propulsion systems, comprehensive supply chain mapping is crucial for meeting the needs of the maritime industry.

At the same time, targeted investment in technology leadership is essential, with critical focus areas including advanced nuclear propulsion, digitalization, autonomy, and electrification. The SHIPS for America Act plays a key role by creating an annual funding stream through 2035 for maritime innovation incubators that accelerate the commercialization of technology in ship design, alternative marine fuels, and resilient port infrastructure. Additionally, the U.S. Center for Maritime Innovation, hosted by MARAD's META program and administered by the American Bureau of Shipping, serves as the federal hub driving emerging maritime technologies. Regional initiatives, such as the University of Michigan's Great Lakes Maritime Initiative, further bolster innovation through focused development and demonstration projects that integrate advanced nuclear reactors, battery safety, and electrification technologies. However, many of these programs remain underfunded, underscoring the urgent need for sustained support from both the federal government and the private sector.

International partnerships provide another pillar of progress. The ICE Pact between the U.S., Canada, and Finland formalizes collaboration on Arctic and polar icebreaker capabilities, encompassing workforce development, research, and coordinated production efforts. The multinational ICE-SHIELD research consortium advances leadership in ice and cold-climate marine technologies by linking academic, government, and industry partners, with ready capacity to expand further given timely support. Private sector investments from global leaders such as HD Hyundai and Hanwha, including major expansions and acquisitions like Philly Shipyard, complement governmental and academic initiatives. Moreover, the trilateral partnership between the University of Michigan, Seoul National University, and HD Hyundai exemplifies effective academic-industry collaboration focused on workforce training and technology development,[15] while the Korea-U.S. Shipbuilding Leaders Forum unites 13 top universities and officials to foster bilateral cooperation.[16] Expanding and deepening these international frameworks can strengthen U.S. maritime competitiveness and enhance collective regional and global capacity.

Korea-U.S. Shipbuilding Leaders Forum
Building on a 2024 trilateral partnership memorandum of understanding with HD Hyundai and Seoul National University, the Korea-U.S. Shipbuilding Leaders Forum gathers experts from leading Korean and United States universities along with government and industry leaders to collaborate on shipbuilding education, research and workforce strategies. The first forum took place June 2025 in Korea with the second taking place October 2025 in Ann Arbor, Michigan.

Moving forward, the priority actions are clear:

- **Invest in rigorous analysis and assessments** to identify viable strategic commercial fleet pathways, considering domestic production, allied procurement, and reflagging approaches.
- **Prioritize passage of the SHIPS for America Act**, ensuring maritime innovation funding and support are available at scale. Collaborate with regional initiatives to establish maritime innovation incubators that boost regional and national technology development efforts.
- **Engage educational institutions** such as the University of Michigan and independent R&D centers to build a holistic, scalable, and coordinated strategy supported by key international alliances that integrates research, workforce development, and policy activities to address evolving maritime needs.

Together, these coordinated steps provide a necessary first step for strengthening the U.S. strategic fleet, revitalizing the commercial shipbuilding industry, and establishing leadership in advanced maritime technologies. Achieving these goals will require immediate and sustained collaboration among policymakers, industry, academia, and international partners to secure America's maritime future.

RECENT GREAT LAKES MARITIME INITIATIVE ACTIVITIES

Advancing battery safety and maritime electrification

The University of Michigan (U-M), Sea Forrest Technologies, American Bureau of Shipping (ABS), and Singapore Institute of Technology (SIT) have joined forces through a signed memorandum of understanding to advance battery safety and maritime electrification.

This collaboration unites academia, industry, and technology innovators to conduct joint research and projects on safer and more efficient battery technologies and electric power systems for marine applications.

The maritime-nuclear nexus

The nexus of maritime and nuclear technologies spans both the direct intersection of these sectors, as well as broader opportunities in supply chains, workforce, and advanced manufacturing. This area is also one where the U.S. and the State of Michigan can take technical and economic leadership, while contributing to the nation's energy security, climate resilience, industrial growth, and national security goals. Our one-day event explored opportunities and connections in this space including a keynote speaker from the state government, a plenary panel, and a series of structured workshop activities.

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