

# FOCUSING ON THE MARITIME FUELS AND TECHNOLOGIES OF THE FUTURE

A research conducted by  
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## **MARTECMA members' views on shipping's decarbonisation roadmap**

Due to environmental concerns and technological advances in the highly competitive and constantly evolving shipping industry, changes to the industry's status quo are becoming necessary. In recent years, the industry's agenda has revolved around decarbonisation, but opinions are divided as to how it can be achieved, given that the shipping industry is fragmented.

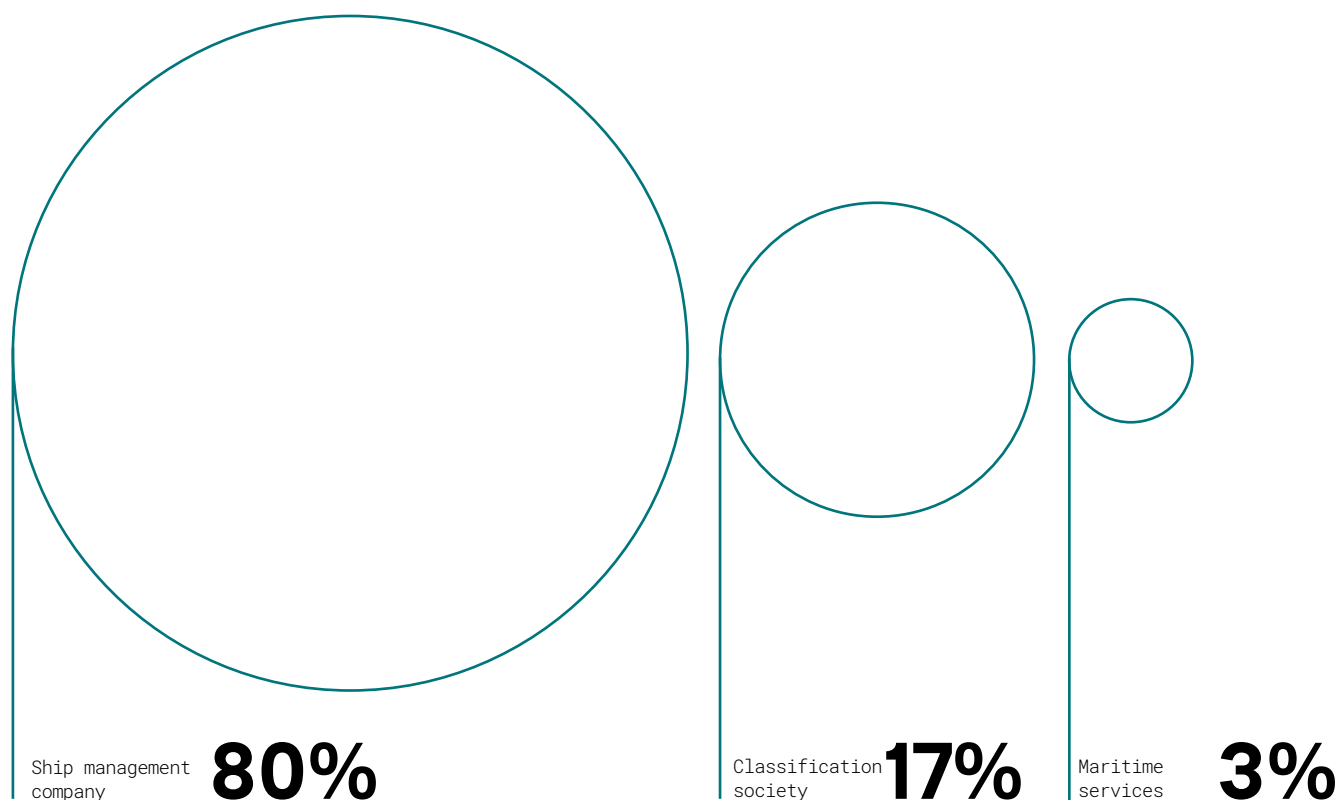
The ever-increasing rate at which new technologies, fuels, and new regulations are being introduced in the shipping industry to reduce the environmental footprint of ships is causing uncertainty for the next day of shipping. Therefore, it

is no coincidence that the good performance of the charter markets in recent years has resulted from the limited new-building orders, as shipowners cannot be sure which fuel or technology will prevail in the coming years.

In this context, Naftika Chronika has conducted a survey on "Green Shipping" based on the responses of MARTECMA members to a related questionnaire. A total of 75 people participated in the survey, of which 60 are representatives of shipping companies, 13 work for classification societies, and two in companies that provide services to the wider shipping industry.

This research aims to record experts' opinions on the emerging trends driven

Graph 1  
Distribution of the survey participants based on the type of company they work for



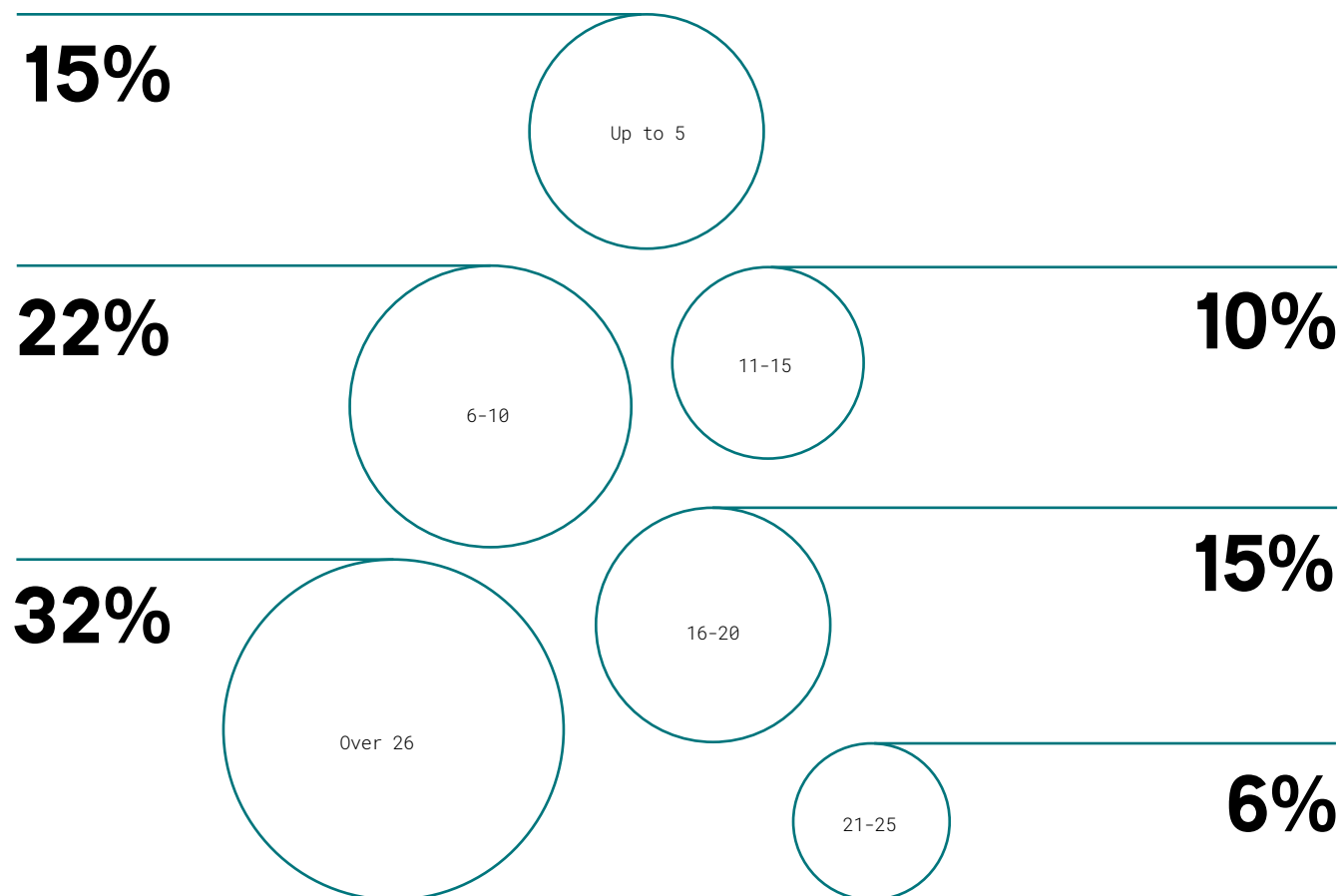
by the need to reduce shipping's environmental footprint and to draw conclusions about their impact on the industry's decarbonisation. Which marine fuels will prevail, and what technologies will be used to reduce fuel consumption and, ultimately, ships' emissions? We hope the responses to these and other questions posed to the survey's participants will trigger a meaningful dialogue among industry stakeholders as shipping begins its journey towards decarbonisation.

#### DISTRIBUTION OF THE SURVEY PARTICIPANTS BASED ON THE NUMBER AND TYPE OF SHIPS MANAGED BY THE COMPANY THEY REPRESENT

As indicated in Graph 1, 80% of the survey participants represent shipping companies of various sizes, categorised according to the number of vessels they manage. The company size category with the highest representation is companies managing more than 25 vessels. There are 19 such companies in the sample, representing 32% of the total (Graph 2).

To facilitate comparisons based on the size of the shipping companies represented in the survey, we have included two additional categories: representatives of companies with a fleet of up to 15 ships and representatives of companies with a fleet of more than 15 ships. 28 of the company representatives belong to the first category of shipping companies, while 32 belong to the second. Another axis of survey participant categorisation is the type of vessels their companies manage. The critical role of bulk carriers and tankers in the Piraeus/Athens fleet is again evident. Of the survey's 60 shipping company representatives, 17 work in companies that exclusively manage bulk carriers and 18 in companies that exclusively manage tankers. Thus, 58% of the participants work in companies that exclusively manage one of the two main types of bulk shipping vessels. At the same time, a significant 37% of participants represent companies managing diversified fleets (Graph 3). It is worth noting that four companies appear to be managing four different

Graph 2  
Distribution of the survey participants based on the number of ships managed by the company they represent



## Fuel for thought

Alternative Fuel reports from Lloyd's Register



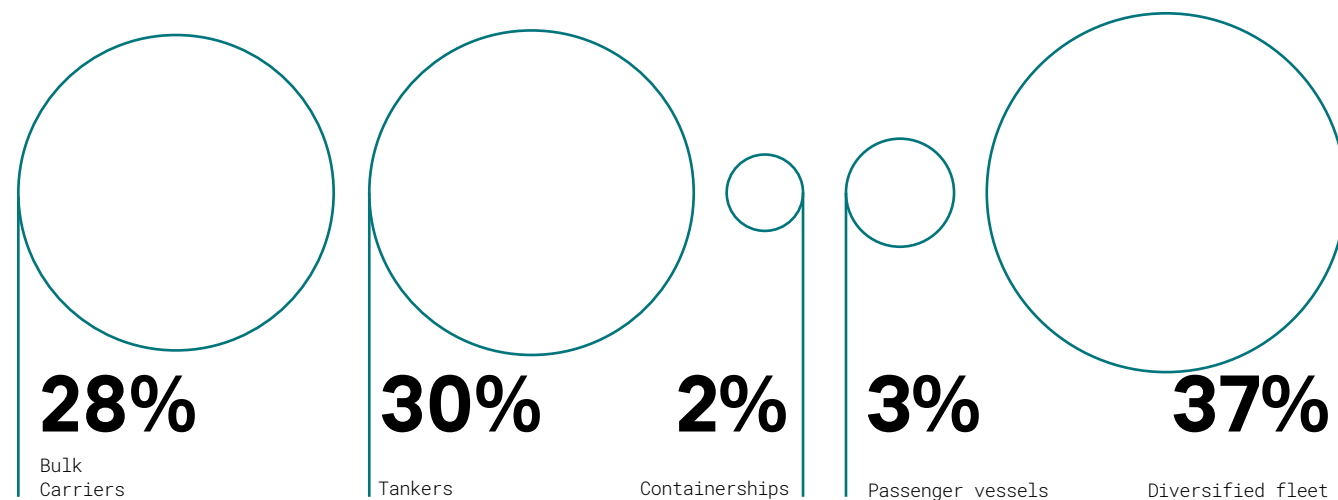
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Graph 3 Distribution of the shipping company representatives based on the types of ships managed by the company they work



types of vessels: bulk carriers, tankers, containerships, and gas carriers. On the other hand, 12 participants represent companies managing only bulk carriers and tankers.

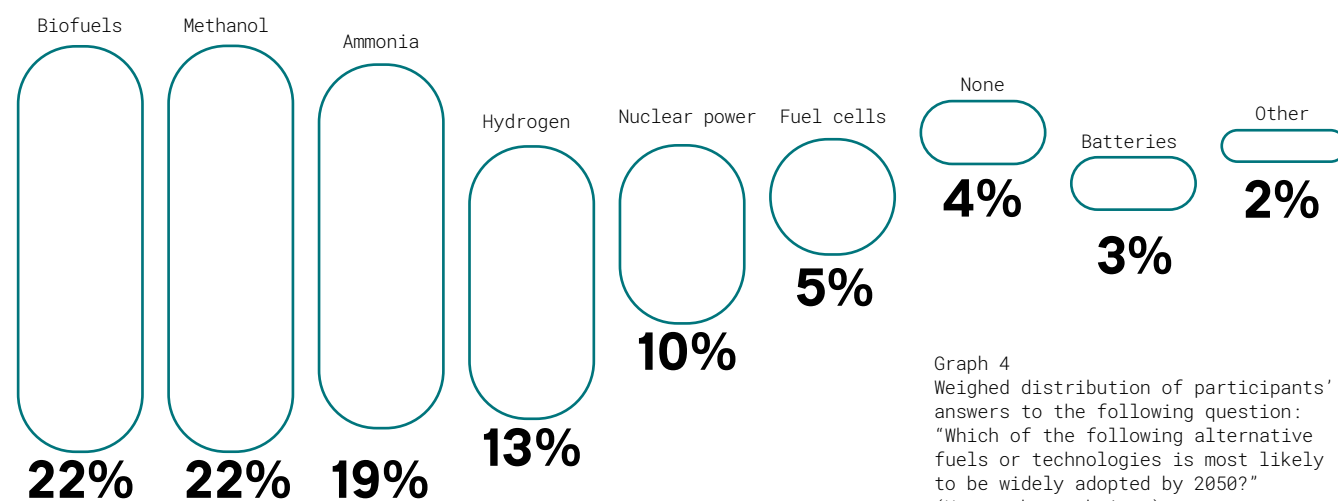
#### THE FUELS OF THE FUTURE

One of the first questions participants were asked to answer was about the fuels and technologies most likely to lead the shipping industry to decarbonisation by 2050.

In the relevant question, the participants could select up to three options; 49 out of 75 (65.3%) selected three answers to this question, 16% two, and 18.7% one.

At this point, it is essential to highlight the logic behind the way the results of this question are presented in Graph 4. First, each one of the participants is of

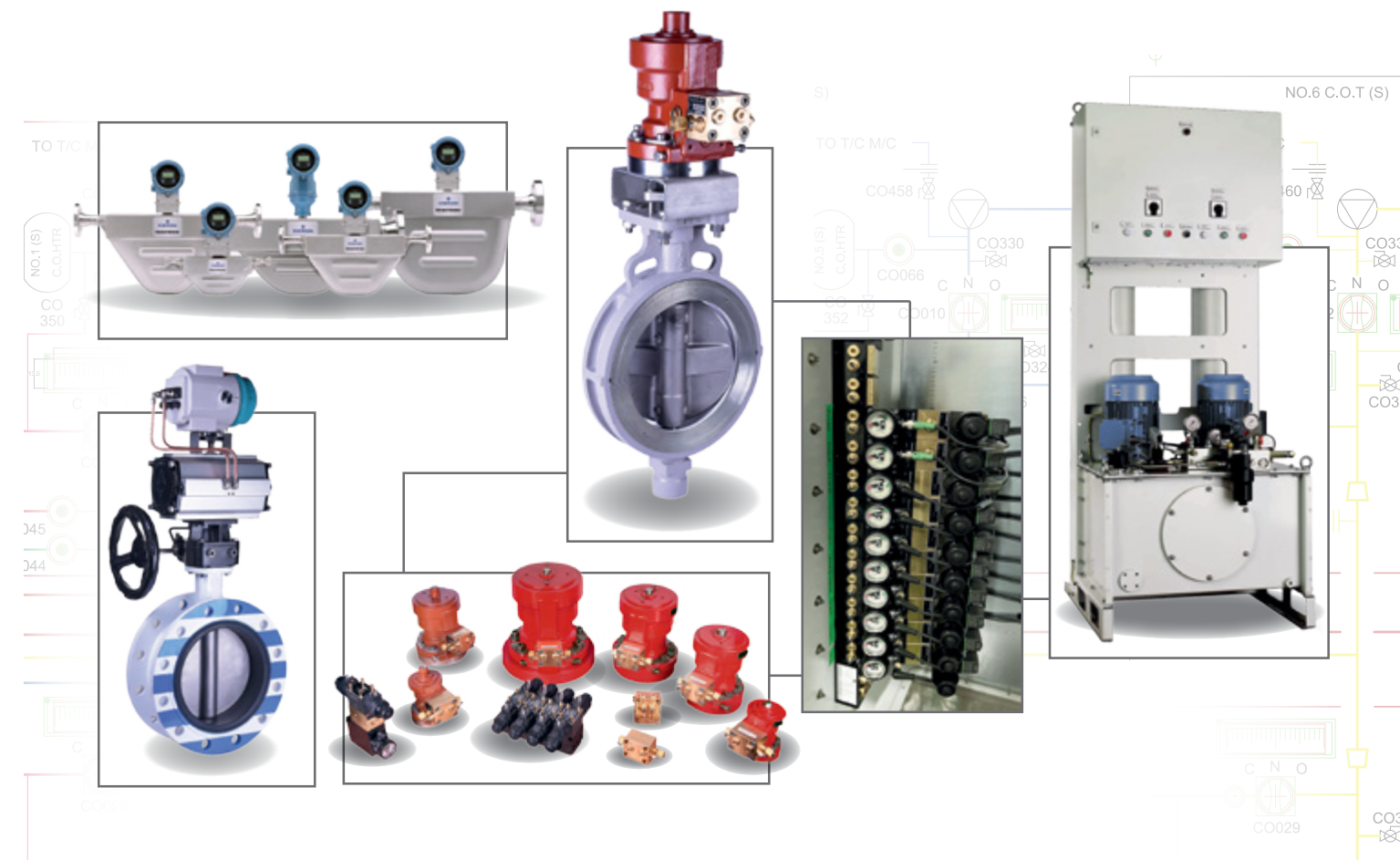
"equal value", so when someone had only selected one of the possible options, the weight of that option equalled 1. At the same time, when someone had selected two of the possible options, each one of them got a weight of 1/2. Last, in cases where participants chose three options, each one got a weight of 1/3. This method assumes that for the participants who gave multiple answers to a question, each of the answers was of equal value to them, which may not necessarily be true. Everything mentioned above also applies to Graph 5. It is worth noting that the way the alternative fuels are produced is not taken into consideration. That is the reason why there weren't multiple possible answers for each fuel (e.g., "brown ammonia", "grey ammonia", "blue ammonia", "green ammonia", etc.).



Graph 4  
Weighed distribution of participants' answers to the following question:  
"Which of the following alternative fuels or technologies is most likely to be widely adopted by 2050?"  
(Up to three choices)



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Based on the answers given by the 75 representatives of shipping companies, classification societies, and service providers participating in the survey, biofuels, methanol, and ammonia are considered the most feasible options for the future. Biofuels are described as an up-and-coming carbon-neutral fuel solution that can quickly enter the global market and help meet the IMO's targets for reducing greenhouse gas emissions from 2030 onwards. In recent years, companies that manage a substantial number of ships, including ships of Greek interests, have been testing biofuels and investigating the potential of these fuels for the next day. At the same time, both methanol and ammonia are viewed as feasible fuels for widespread adoption by 2050, while methanol, in particular, appears to be the "favourite" choice for containership newbuildings; its proponents include their easy handling and storage and the reduction of tank-to-wake carbon emissions in the benefits it provides.

It is worth noting that hydrogen and nuclear power are also considered options that can play a vital role in the shipping industry's decarbonisation.

In any case, most respondents consider that several options have a 2050 implementation horizon, supporting the argument of many industry stakeholders that suggest a multi-fuel future for shipping as there is no one-fits-all solution.

## THE TECHNOLOGIES OF THE FUTURE

The race towards decarbonisation is taking place on multiple fronts. One concerns the fuel that will prevail in the future, and another the technologies to be used on ships to reduce emissions. In a related question, participants were asked which technology/technologies they consider most likely to be widely adopted in the shipping industry. 61 participants chose two of the possible options, and the remaining 14 chose only one.

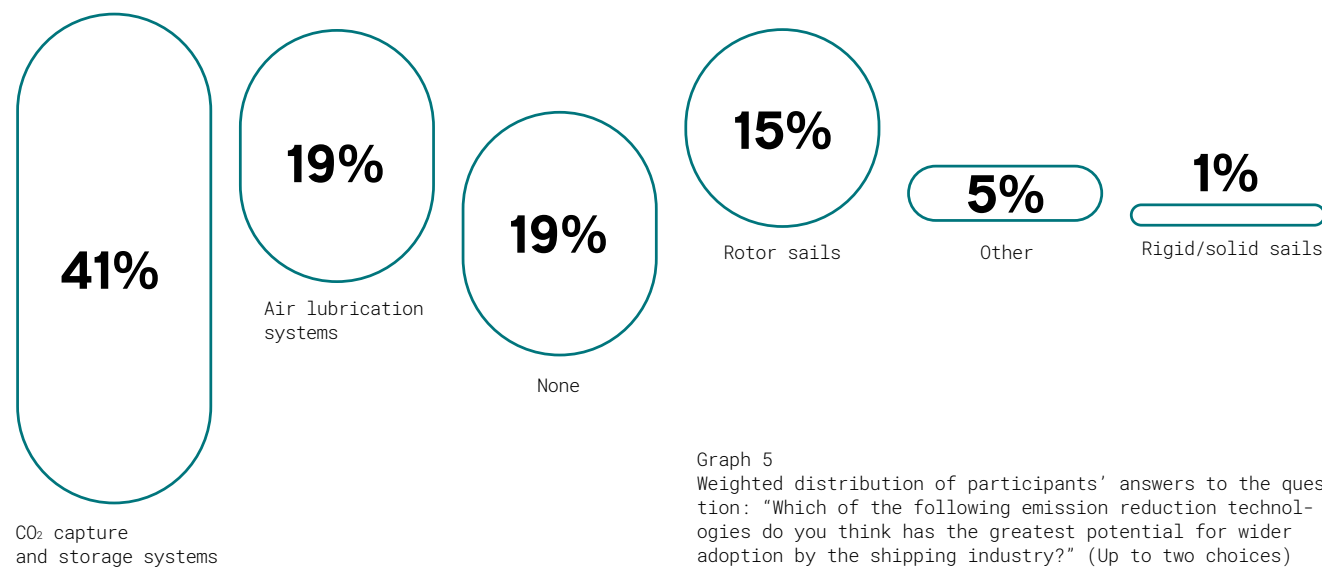
Based on their answers, the technological solution projected to play the most critical role is "CO2 capture and storage systems". This technology is becoming increasingly popular in recent years, with a multitude of JVs, cooperations, and MoUs being announced.

The second most popular technology is "air lubrication systems", while the third most popular is "none"; Based on the participants' answers, there is a high level of uncertainty regarding the feasibility of the widespread adoption of a specific technology in the foreseeable future.

A small part of the participants proposed different technological solutions that weren't part of the questionnaire, such as "photosynthesising hydrogen" and "silicon coatings".

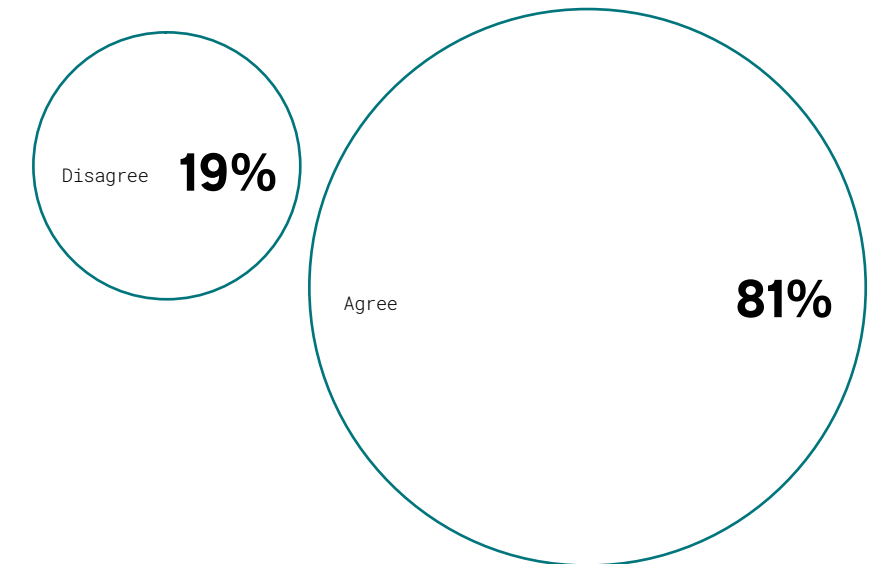
## THE ROLE OF LNG AS A LONG-TERM MARINE FUEL

One of the main issues that cause concern in the shipping community is the energy transition and the fuels of the future. In



Graph 5  
Weighted distribution of participants' answers to the question: "Which of the following emission reduction technologies do you think has the greatest potential for wider adoption by the shipping industry?" (Up to two choices)

Graph 6  
Distribution of participants based on their response to the statement: "LNG is just a transition fuel whose use will be greatly reduced, if not eliminated, by the end of the century"



this context, the role of LNG as a fuel monopolises interest: quite a few industry stakeholders argue that in the short and medium term, LNG will be the fuel that will allow shipping to limit the greenhouse gas emissions of ships. This claim is confirmed by the orderbook developments, with approximately 60% of the orders placed since the beginning of 2022 (in terms of GT) concerning vessels consuming alternative fuels mainly LNG. However, with the end of the century in mind, opinions are divided. Although most believe that LNG is a transition fuel and its role will have been eliminated by 2100, several express the opposite view.

In the related question, 81% of the participants agreed that "LNG is just a

transition fuel, and its use will be significantly reduced, if not eliminated, by the end of the century", while 19% disagreed.

In this category, the most notable finding is that of the survey participants working in the 28 shipping companies whose managed fleet does not exceed 15 ships, 93% agreed with this statement. However, for those working in the 32 shipping companies managing fleets numbering at least 16 ships, the percentage that agrees amounted to 79%, which is not significantly different from that of the entire sample (81%).

## FIRST MOVERS AND THE LACK OF INCENTIVES CHALLENGE

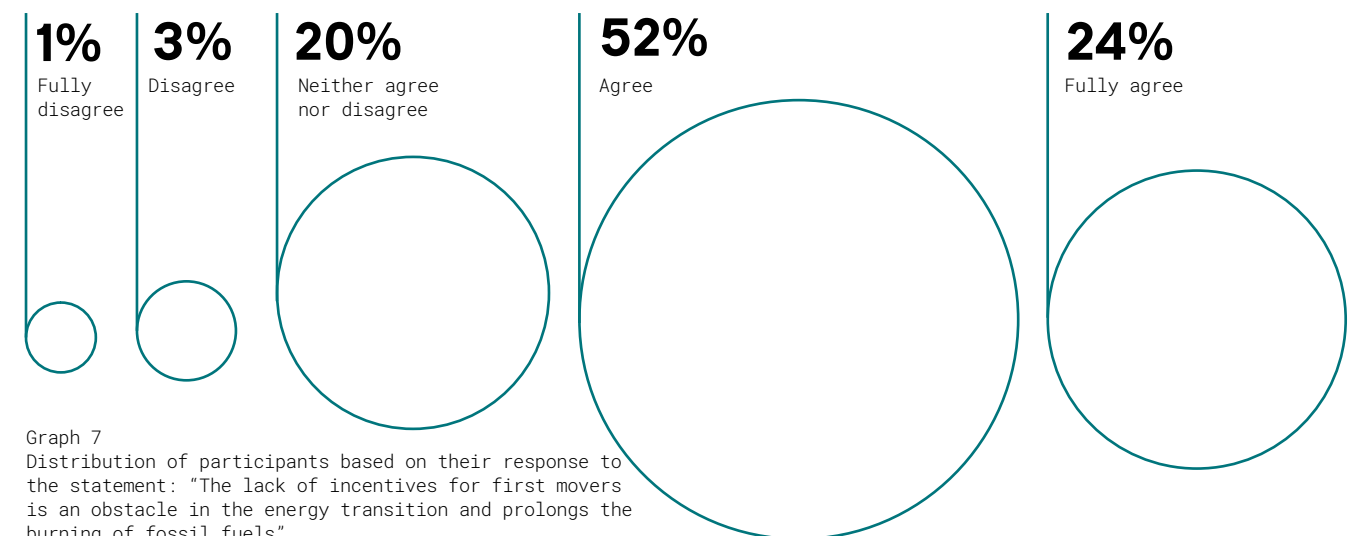
In the quest for the fuel of the future but also the technological innova-

tions that will enable its exploitation, one of the most critical challenges is the lack of incentives for those willing to take the first steps.

Especially in shipping, where the cost of ordering a ship starts at about \$30 million and can well exceed \$250 million, taking initiatives also means taking a significant risk.

The findings of this research indicate that the lack of incentives for first movers is an obstacle to the energy transition and prolongs the burning of fossil fuels. In this context, the International Chamber of Shipping highlights the need to develop incentives for early movers at every opportunity.

About three out of four participants



Graph 7  
Distribution of participants based on their response to the statement: "The lack of incentives for first movers is an obstacle in the energy transition and prolongs the burning of fossil fuels"





agreed or strongly agreed with this statement. However, it is worth noting if the size of the company the participants work for is taken into account, these percentages do not differ significantly. Furthermore, none of the representatives of shipping companies answered that they completely disagreed with this statement.

#### THE EFFECTIVENESS OF THE ENVIRONMENTAL MEASURES IMPOSED ON EUROPEAN SHIPPING

Amid the broader effort being made for the energy transition of the global economy, maritime transport, despite its limited contribution to global greenhouse gas emissions and pivotal role in international trade, has not escaped the “eye” of the legislators, especially those in Europe. Given the industry’s global nature, the overall sentiment among survey participants was that EU initiatives are insufficient to reduce shipping’s environmental footprint, even at the European level, which is in line with the prevailing feeling among shipping stakeholders who believe that effective measures can only be taken at the IMO level.

Only 11% of the participants consider that the ETS is an effective measure to reduce the environmental footprint of European shipping, while the corresponding percentage for the fuel levy is 25%. On the other hand, 64% of participants consider slow steaming a more effective solution. In the past, in view of the implementation of the sulfur cap from 1 January 2020, many shipowners and managers in international fora had advocated reducing ship speed as an immediate and realistic option and wondered why the legislators did not promote it as it is a measure with zero costs and quick results.

Notably, the above percentages do not vary significantly from respondents’ working for bulk carrier or tanker managing companies or those based on the sample distribution by company size.

#### THE IMO’S 2030 EMISSIONS

#### TARGET

In addition to the significant ambitions set for 2050, the IMO has imposed a 40% carbon intensity reduction target by 2030. However, this short to medium-term target has been causing considerable concern in the international shipping community, as most remain uncertain about whether it is achievable.

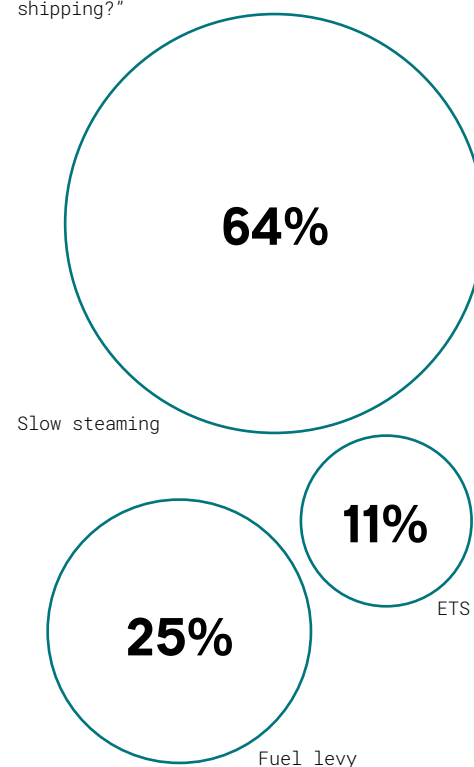
Almost half of the participants are undecided about whether such a goal is achievable: 53% responded that they consider it “doubtful” that this goal will be achieved, 21% think it is “possible”, while 21% “rather unlikely.” Notably, these percentages do not differ significantly, even if only the answers of the respondents who consider LNG a transitional fuel or those who think slow steaming is the most effective solution to reduce the environmental footprint of European shipping are taken into account.

#### CONCLUDING REMARKS

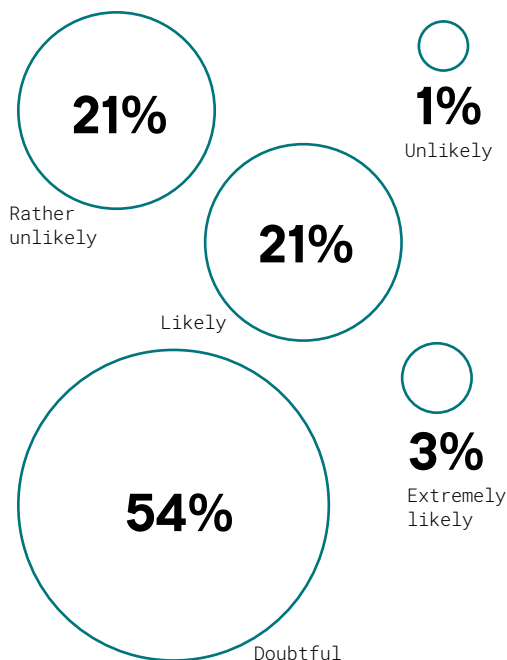
This research is our first attempt to capture the opinions of Greek shipping community members with a solid technical background on the environmental and regulatory path followed by the industry in its effort to reduce its carbon footprint. It reflects similar views to those expressed in most international fora regarding the range of potential marine fuels and technologies that could, under certain conditions, contribute to shipping’s energy transition. Regarding LNG, the majority of the survey respondents, like most shipping industry stakeholders, consider it a transitional fuel whose uptake will be limited -if not eliminated- by 2100.

The fact that only 11% of this survey’s participants consider the ETS an effective measure should raise the alarm in Brussels decision-making centres regarding the policies they are promoting to reduce the environmental footprint of European shipping. The messages about whether the IMO’s 2030 targets will be met are mixed.

Graph 8  
Distribution of participants based on their response to the question: “Which of the following measures do you consider most effective in enforcing the reduction of the environmental footprint of European shipping?”



Graph 9  
Distribution of participants based on their response to the question: “How likely do you think it is that the targets set by the IMO to reduce carbon intensity by 40% by 2030 will be achieved?”



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