

*Promoting the responsible  
use of ammonia in a  
sustainable economy*

# 2023

## ANNUAL REPORT



**AMMONIA ENERGY**  
ASSOCIATION



The Ammonia Energy Association (AEA) was founded in 2004 to **promote the responsible use of ammonia in a sustainable economy**. Our mission encompasses both the decarbonization of ammonia production and the use of low-emission ammonia as a fuel and energy carrier to decarbonize other sectors. AEA is committed to enabling the global ammonia value chain to achieve net-zero by 2050.

Twenty years since its founding, AEA is now a **global trade association whose 250+ corporate members represent the full value chain of ammonia across multiple sectors**. We work with our member companies and partner organizations to share knowledge, foster collaboration, develop key programs, and engage in advocacy with industry, policy-makers, and the public to promote the safe and sustainable adoption of low-emission ammonia.

## *Knowledge Stewardship*

- Creating, collecting, organizing, and disseminating relevant information;
- Educating via publications, presentations, and events.

## *Collaboration*

- Providing opportunities for member companies and partner organizations to connect and collaborate.

## *Program Development*

- Developing strategic programs that unlock potential for ammonia energy, including:
  - Establishing an Ammonia Certification System,
  - Sharing and amplifying best practices around safety and identifying gaps.

## *Advocacy*

- Promoting the continued safe use of ammonia, from production and storage through transportation and end use;
- Engaging with governments, regulatory bodies, and intergovernmental agencies.

Learn more about  
[AEA's principles](#).

2023



**AMMONIA ENERGY**  
ASSOCIATION

## Message from AEA President

In 2023, the Ammonia Energy Association (AEA) experienced remarkable growth, reaching 252 corporate members from 36 countries around the world. While membership revenues support most of our work, we also strengthened the association by diversifying our income sources to include our programs, especially the successful members-only 20th Annual Conference in Atlanta. This growth enabled us to significantly expand our activities and impact, making tremendous investment in our flagship project, a global certification system for ammonia. We persist in our mission to benefit our members and the global community.

Our global reach in 2023 extended to Brussels, Tokyo, Santiago, Cairo, Canberra, Chicago, and Washington D.C. and impressive work engaging with the International Maritime Organization. In October, I presented in São Paulo about "Ammonia – the Green Oil of the Future." Around the world, the governments of countries like Brazil are making a commitment to sustainability and recognizing a critical role for ammonia energy.

New import/export infrastructure was announced everywhere – Japan, Korea, the Middle East, Europe, the USA, Africa, and Latin America – suggesting that the global trade of low-emission ammonia is ready to take off. While there are still some obstacles with offtake agreements, the pathway forward is becoming clearer: ammonia can be a global fuel of the future, replacing oil and gas.

I would like to thank the staff and all the AEA members who participated in our committees and working groups, as well as our partners supporting our work. I'm looking forward to continuing to create additional value for our members and make our business goals of clean ammonia more realistic, faster, and more economical.

Thank you very much for your support,

**Hans Vrijenhoef**  
*President*



# Message from AEA Executive Director

In 2023, AEA achieved several major milestones: we published our *Carbon Footprint Methodology* for the ammonia certification initiative, we hosted our 20th Annual Conference – our largest yet, and our first member-only conference – and we passed 250 members, connecting companies from around the world and across the value chain.



But much of our work was quieter, behind the scenes.

No opportunity illustrates the AEA's value proposition better than the potential to adopt ammonia as a maritime fuel. A real debate exists today around future fuel choices in the maritime sector. The speed and scale with which ammonia will be adopted safely as a maritime fuel is being decided today, and these near-term choices may define the long-term opportunity for ammonia energy in the net-zero economy. The following pages illustrate some of the ways the AEA created real impact for our members in 2023, through the lens of the maritime sector.

The AEA plays a unique role, amplifying critical data and insights from our members and partners, and driving forward our own programs. While much of the focus for our certification program has been on supporting alignment between regulations in the EU and South East Asia, the biggest market will likely be maritime, and the biggest regulator the IMO.

There's a lot of work ahead of us – and a world of opportunity.

**Trevor Brown**  
*Executive Director*



## 252

**Members**

**92** joined during the year



## 8

**Staff**

**2** joined during the year

## Knowledge Stewardship

The AEA's work is most visible through our newsletter, articles, presentations, webinars, and website. This public material is available to everyone looking for information about ammonia – our 20-year archive of relevant and practical knowledge has enabled the world to understand and embrace the concept of ammonia energy. It isn't surprising that our most-read newsletter article in 2023 was on maritime engine deployments.

Beyond making good information accessible, the AEA leverages this knowledge to deliver impact – amid all the noise, we aim to amplify what needs to be heard. Three of our workstreams evolved to new heights in 2023:

**Webinars:** As ammonia energy projects move towards implementation, the questions facing our members and other stakeholders have grown more granular. In February, we hosted a webinar about ammonia's environmental impacts with the Environmental Defense Fund, Ricardo, and Lloyd's Register Maritime Decarbonization Hub to unpack [Ammonia at Sea: exploring the potential impact on marine ecosystems](#). In November, we dug into the other side of the safety issue with the Maersk McKinney Moller Center for Zero Carbon Fuels and Lloyd's Register Maritime Decarbonization Hub to explore [Recommendations for Design and Operation of Ammonia-Fuelled Vessels Based on Multi-disciplinary Risk Analysis](#). By amplifying progress on hazard identification and mitigation, we support the safe implementation of ammonia as a maritime fuel.

**Market Intelligence:** AEA's market intelligence database contains more data than most: it counts 279 low-emission ammonia plants operational or in development around the world at the end of 2023, representing more than 292 million tons of low-emission ammonia capacity. While access to this database is a member benefit, AEA staff leverage this data to promote our members' interests.



# 222

**Articles published**

**1,001** articles in library

Most read newsletter article:  
**4,692** clicks, September 2023

[New marine engine partnerships to accelerate deployment](#)



# 15

**Webinars hosted**

Largest audience:  
**1,539** views, May 2023

[Scaling flexible ammonia production in China to giga watt-size](#)



# 279

**Unique projects in AEA market intelligence database tracked**

Low-Emission Ammonia Plants:  
Global Project List

**25** operational  
**18** under construction today  
**55** countries

## Knowledge Stewardship Continued

**Conferences:** Our ability to amplify important information was perhaps most visible in our conference programming. In August, at our fifth annual Ammonia Energy APAC Conference, our keynote speaker was Sanjay Kuttan, Chief Technology Officer of the Global Center for Marine Decarbonization, who presented us with early results from their study into ammonia bunkering in Singapore, [Ammonia as marine fuel: Risk awareness vs risk adversity](#). At our 20th Annual Conference, we hosted two separate workshops digging into safety regulations for ammonia: one around tank terminals at ports (PGS-12 in the Netherlands), and another exploring how pilots and demonstrations form the evidence-base for the development of a code for ammonia fuel at the International Maritime Organization.

## Collaboration

Our [Annual Conference](#) was a tremendous success, with more than half of our global member companies joining together for three days of member-only discussion and collaboration. Our event is a town hall, filled with the voices of industry experts and equals. The spirit of community and constructive dialogue that we experienced in Atlanta was second to none.

We observed an increasing number of media releases announcing partnerships between our member companies – members linking up with one another, around the world and across the value chain.

## Program Development

**Certification:** With one-quarter of our members engaged in the AEA's certification working group, this initiative was our primary focus in 2023. We began work on the Carbon Footprint Calculation Methodology in January, and we published the finished document in November. We developed three other key documents during the second half of 2023: the System Document, the Procedures Document, and the Auditor Checklist – essentially completing the design phase of the initiative. In 2024, these documents will be reviewed and refined, and the system design will be tested in case studies – all in preparation for pilot operation of the certification system in 2025.



### 20th Annual Conference

**300+** attendees representing  
**151** Members from **30** countries  
**61** Presentations over **3** days  
**771** presentations in archive



### 5th Annual Ammonia Energy APAC Conference

**145** attendees representing  
**81** organizations



20

**AEA Staff & Leadership participated in conferences globally**

**AEA was a Supporting Partner for 19 international events**



229

**Individuals engaged on AEA committees and working groups**



25%

**of AEA Members in our Certification Working Groups**

**127** individuals from  
**72** Member companies  
**15** Observer organizations

# Advocacy

In late 2022, the AEA Certification Committee established a set of design principles for the certification initiative, defining our objectives: to enable differentiation in the marketplace for low-emission ammonia, to facilitate cross-border trade, to enhance credibility throughout the supply chain, and to support alignment between multiple certification schemes, standards, and regulations.

Throughout 2023, staff advocated for these principles through partnerships and dialogue with strategic global organizations. A few highlights include:

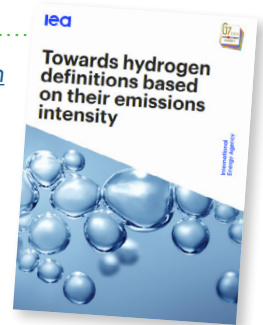
## JANUARY

International Renewable Energy Agency (IREA) published [Creating a Global Hydrogen Market: Certification to enable trade](#). Staff wrote sections of the text and provided feedback on the draft of the document, which “identifies gaps that will hinder the development of hydrogen certification across borders.”



## APRIL

International Energy Agency (IEA) published [Towards hydrogen definitions based on their emissions intensity](#). Staff participated in the inception workshop and provided feedback on the draft document. This report launched what has become a global embrace of the AEA’s technology-neutral position in certification and standards: moving away from differentiating products based on “blue” versus “green” technology pathways and towards clear quantification of emissions intensity.



## JUNE

AEA staff were at the International Maritime Organization (IMO) ISWG meeting, in advance of MEPC80, presenting our members’ case for well-to-wake accounting with a formal submission from the International Bunker Industry Association (IBIA), which we co-authored with Methanol Institute, European Biodiesel Board, and European Biogas Association – demonstrating to the IMO a powerful consensus between all future fuels.

## OCTOBER

Global Maritime Forum’s October 2023 report, [Climate Action in Shipping, Progress towards Shipping’s 2030 Breakthrough](#) builds its conclusions on AEA’s market intelligence data. Our support went beyond providing the data to explaining the data: demand for low-emission ammonia won’t be shared equally between existing fertilizer markets and future energy markets. This insight influenced fuel availability projections to increase confidence in ammonia as a maritime fuel.



## DECEMBER

At COP28, International Organization for Standardization (ISO) officially launched its [TS 19870](#) for hydrogen technologies, which aims to provide a “trusted international methodology for assessing the greenhouse gas emissions of hydrogen pathways,” including ammonia and other derivatives. In 2024, AEA is working with the ISO working group to develop a case study that shows the alignment between the ISO technical specification and the AEA certification system.

# 2023 Financials

## AEA Statement of Financial Position

December 31, 2023

### Assets

Cash	559,121
Accounts Receivable	171,546
Other Current Assets	14,000
Deposits	14,928

### Total Assets

**\$759,595**

### Liabilities & Net Assets

Accounts Payable	118,595
Other Current Liabilities	58,135

### Total Liabilities

**\$176,730**

### Net Assets

**\$582,865**

### Total Liabilities and Net Assets

**\$759,595**

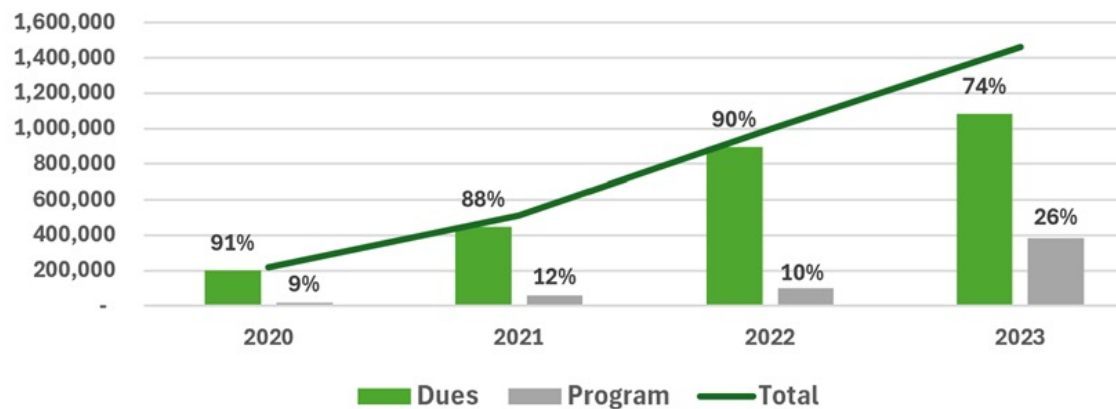
### Net Asset Reconciliation

Net Assets, Beginning of the Year	463,371
Net Income	119,494

### Net Assets, End of the Year

**\$582,865**

## Annual Revenue by Category



Continued revenue growth in 2023 shows an increase in the percentage of non-dues revenue compared to prior years. This positive impact in the 26% came from AEA hosting its Annual Conference independently. By doing so, AEA has greater control over the conference logistics, enabling us to deliver a conference that truly meets our members' needs.





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Copenhagen  
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Denbury  
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Ambient Fuels  
Avina Clean Hydrogen  
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Eneus Energy  
Enbridge  
Envision Group\*  
European Institute for  
Energy Research  
(EIFER)  
Fertiberia  
Fidelis New Energy  
First Ammonia  
Flexens  
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Energy  
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inodú  
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JGC Corporation

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Linde  
Liquium  
Lotte Fine Chemical  
Lynas Rare Earths  
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Pattern Energy  
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Southern Devall  
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Starbulk Carriers  
Stolthaven Terminals  
Sunborne Systems  
Switch2  
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Talos Energy  
Technip Energies  
Técnicas Reunidas  
TotalEnergies\*  
TritenIAG  
Tsubame BHB  
UH2  
Vesta Terminals B.V.  
Woodside Energy  
World Energy GH2

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Advanced Thermal  
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alfanar  
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Ammobia  
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Evergny  
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ReMo Energy  
RWE Supply & Trading  
Samson Group  
SBM Schiedam  
SERENA Energy US  
Shrieve Chemical  
Company  
Siemens Energy  
SK Innovations  
SLB Venture Group  
Stamford Shipping  
StormFisher Hydrogen  
Strata Clean Energy  
Sumitomo Corporation  
Svanehøj Danmark  
Syzygy Plasmonics  
TasRex  
Terrestrial Energy  
TGE Gas Engineering  
Theia Energy  
Thermon  
ThioSolv  
Toyo USA  
TRIARC Tank  
Tyczka Group  
Umicore  
Uniper  
Vahterus  
VeryOne Inc.  
Votalia  
Vopak  
Wesfarmers Chemicals  
Energy & Fertilisers  
Wood Mackenzie  
Yokogawa Corporation  
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\* indicates representation on Board of Directors | Members as of 12/31/23.

Sign up for  
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ASSOCIATION

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