N.2 NOVEMBER 2026

Innovation+

RINA'S MAGAZINE ON INNOVATION



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Innovation+, 2026, II Edition
Registration at the Tribunale di Genova N.2/2025 del 20/03/2025
Published in Genoa, November 2026
Printed at Sistemi Service S.r.l., - Via Borzoli, 135-137, 16161 Genova
Edited by RINA S.p.A. - Via Corsica, 12 Genova
A property of RINA S.p.A. – Managing Editor/Direttore Responsabile: Giorgio Baffo
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Why innovation **matters**

We are living through a moment shaped by two simultaneous forces: accelerating technological progress and growing uncertainty about the future of industry, markets and long-term change.

In this environment, innovation matters because it helps create direction, build trust and turn complexity into concrete solutions.

For RINA, innovation is not novelty for its own sake. It is the ability to turn competence into applied, scalable value: solutions that can be implemented, adopted and measured. Every effort must therefore be assessed against tangible outcomes: adoption, operational relevance, client impact and scalable results. Otherwise, innovation remains potential rather than progress. Our competitive strength does not lie in isolated invention, but in the combination of human expertise, technical competence and digital capabilities.

It is where experience, engineering and technology converge that innovation becomes meaningful and creates lasting advantage for our clients, who are at the core of all our activities.

This is why collaboration is essential. Innovation gains strength when expertise, research, industry needs and market insight are brought together around a shared direction. It flourishes in ecosystems, not in silos.

From this perspective, the ability to innovate becomes a shared responsibility: embedded across our organization and extending into the ecosystems in which we operate.

Within this collaborative model, artificial intelligence is becoming an increasingly important enabler. Striking the right balance between human judgment and AI-enabled capabilities is therefore essential. At RINA, technology is designed to elevate the human contribution, not replace it: supporting better decisions, strengthening our services and opening new possibilities for our people and our clients.

This principle has guided RINA's path from the beginning. Over time, it has taken shape through concrete initiatives that connect ambition with execution, bringing innovation closer to the challenges faced by our clients, our industries and our markets.

Innovation, in this sense, is not separate from business performance. It is part of how value is created, capabilities are strengthened and growth is sustained.

The stories collected in this edition of Innovation+ illustrate this journey in practice. They show how innovation takes shape across sectors - from circular solutions and energy reuse to digital infrastructures and marine applications - and how different forms of expertise can come together to address complex challenges and create tangible value.

This is ultimately why innovation matters: not because it moves the world forward in abstract terms, but because, when guided by competence and collaboration, it turns change into progress people and industries can trust.

Paolo Moretti
CEO & General Manager, RINA



Singapore: leading the **maritime transformation**

Most shipping nations are now pivoting towards a wholescale transformation of their maritime sector.

Because shipping is a global trade, most of the key shipping nations with major ports (Denmark, the Netherlands, Japan, China etc..) are undergoing a transformative 'twin transition' focused on both rapid decarbonization and AI-driven operational efficiency. In turn, this implies enhanced cyber-physical security, and collaborative open innovation.

Singapore is uniquely positioned at the centre of this evolution due to its strong tripartite alignment between government, industry, and research/academia. It is also a key hub for testing new fuels, and a trusted, talent-driven shipping environment.

The Singapore Maritime and Port Authority (MPA) acts as both a regulator and a business developer, providing a clear 30-year roadmap (e.g., the Maritime Singapore Decarbonisation Blueprint) that gives investors long-term certainty.

This enables it to offer structural assistance such as:

- Regulatory Sandboxes: Singapore provides "safe spaces" to test high-risk technologies - like autonomous vessels or ammonia bunkering - allowing for real-world validation before full-scale commercialization.
- Infrastructure Investment: The Tuas Port project serves as a physical commitment to the future, integrating AI, 5G, and full automation from the ground up rather than retrofitting old systems.
- Integrated Digital Ecosystems: Initiatives like digitalPORT@SG™ create a "single window" for all port transactions, mandating digitalization across the supply chain.

Interview with **Michael Phoon**
Senior Adjunct Fellow, MPA Academy, Port of Singapore and Chairman of the Advisory Committee of RINA's OIH



Singapore's status as a leading shipping nation enables a culture of open innovation and collaboration over pre-competitive R&D, facilitated by maritime innovation hubs such as PIER71™ and RINA's own Singapore Open Innovation Hub.

International organizations such as the Global Centre for Maritime Decarbonization (GCMD), Intertanko, Asian Shipowners' Association, World Shipping Council, BIMCO, Nautical Institute, International Bunker Industry Association (IBIA), and recently International Chamber of Shipping (ICS), also have their Asian offices in Singapore.

Their presence and support provide an ecosystem of feedback, and sharing of best practices. Singapore in turn provides a highly skilled local workforce.

Providing a blueprint
Other nations could benefit from the same approach by centralising their maritime strategy. This should include the empowerment of a single entity that can align port and transport ministries with energy providers.

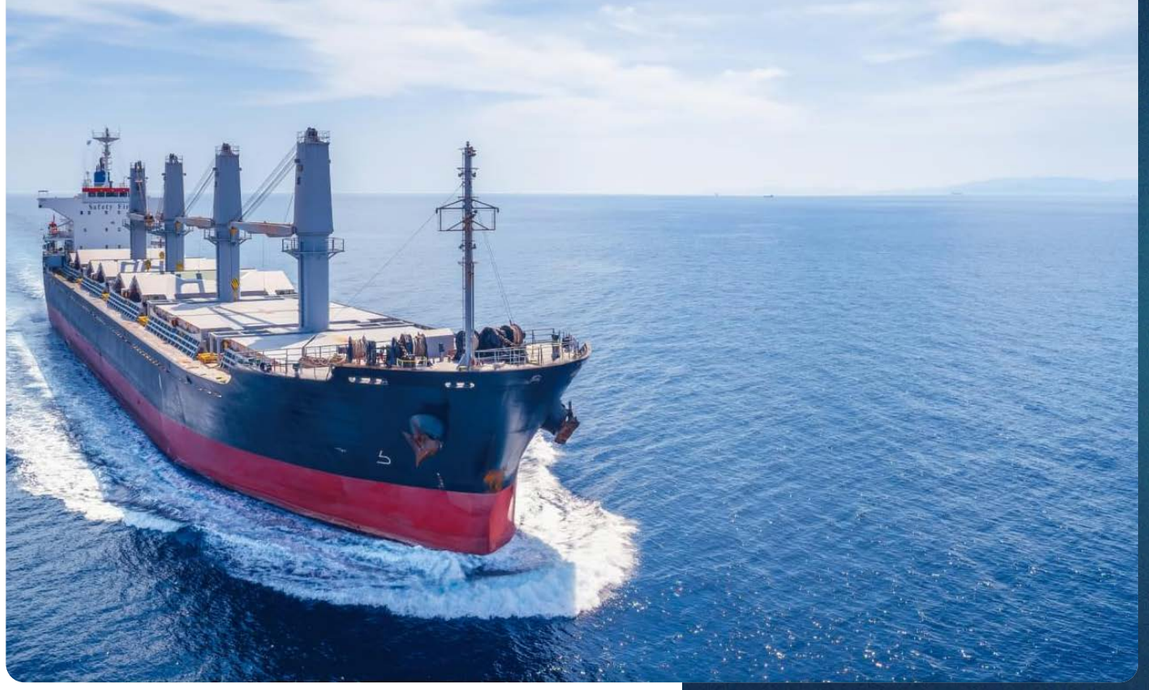
Incentives like port concessions for green vessels and mandatory digital bunkering can accelerate industry-wide adoption.

Green and Digital corridors can also play a key role, and Singapore is scaling its models by partnering with other ports (e.g., Rotterdam and Los Angeles) to create standardized shipping lanes.

The benefits of innovation hubs
RINA's Singapore Open Innovation Hub (OIH) is set to play a key role going forward.

OIH acts as a neutral and safe space for diverse stakeholders. By bringing together bodies such as the Maritime & Port Authority of Singapore (MPA), with its regulatory foresight, academia such as the Singapore Institute of Technology (SIT), and the agility of PIER71™ startups, we hope to translate complex challenges into collaborative solutions.

RINA's OIH provides the platforms needed for real-world validation, ensuring that digitalisation and decarbonisation projects are commercially scalable and safe. Many maritime innovations fail during the transition from lab to sea, without attracting "mass" adoption. The Hub can also serve as a 'safe harbour' for data sharing, as corporates are often hesitant to share operational data. Finally, beyond technology, the hub will play an important social role, integrating students and researchers into live industry projects.



Going forward, we hope OIH can accelerate the collaboration through Integrated Testing Frameworks: by partnering with the MPA to conduct Proof of Concepts, Live Trials, this will exhibit a "regulatory-approved" environment.

Such a development would allow startups to test solutions (like autonomous drones for hull inspections, shore-ship deliveries) with immediate feedback from both the classification societies/ inspection and other service providers and the regulator (MPA), thereby drastically shortening the time to market for new levels of services, or re-writing the procedures for established processes.

The future
In the years ahead, we see the relationship between RINA and Singapore's ecosystem evolving from a traditional 'service provider' model into a deeply integrated strategic partnership. RINA will be a trusted partner in Maritime Singapore's national ambitions, and turn them into international standards.

Specifically, we see Singapore's future role as setting the standard for green corridors. By leading the creation of Green and Digital Shipping Corridors, it will define the harmonized protocols for alternative fuel bunkering and data exchange that the rest of the world will adopt.

Singapore is also acting as the world's 'Living Lab'. With the completion of the Tuas Mega Port, Singapore will be the primary site for the global debut of large-scale autonomous operations and port electrification, serving as the proof-of-concept for future-ready maritime infrastructure.

Scan the QR code to learn more about **RINA's Open Innovation Hubs**

BIOGRAPHY

Michael Phoon is a Senior Adjunct Fellow at the Port of Singapore's MPA Academy and the Managing Director of the London-based Dry Bulk Centre of Excellence, the organization founded by Intercargo and RightShip to promote safety, security and environmental management standards in the dry bulk industry.

Michael started his career at Hewlett Packard, where he spent 25 years, becoming Senior Director and General Manager, HP Networking, South East Asia Taiwan and Hong Kong Region. Subsequently, Michael spent 10 years as the Executive Director of the Singapore Shipping Association (SSA), where he reshaped and rebranded SSA into a trusted advisor to the MPA, MOT and related maritime entities.

He created the Guidebook for Crew Change during the Covid period, and his manual was described by the IMO as a global "gold standard" in transferring crew safely and responsibly during the pandemic. He also set up and operated a Seafarer Vaccination center (SEAVAX) in Singapore, enabling many vessels calling to Singapore to have their crews vaccinated.
During his tenure in SSA, Michael became the Deputy-Chairman of the Singapore-based National Maritime Safety@Sea Council, which promotes safety for all users of the sea space. Currently, he is also Chairman of the Advisory Committee of RINA's Open Innovation Hub in Singapore.

Recovering waste heat **from data centres**

Interview with **Javier Martín Sanz**
Chief Energy and Waste Innovation Officer



Data centre heat generation and the accompanying waste heat recovery is an increasingly important topic in the drive to decarbonization.

The exponential growth in data centre capacity - driven by AI, cloud computing, and edge computing - is creating unprecedented waste heat availability. This excess heat production varies significantly in scale and presents a dual challenge: the risk of urban heat island effects in densely populated areas, and simultaneously, a valuable opportunity for heat recovery and reuse in other buildings or at different times.

In total, European data centres will consume an estimated 98.5 TWh of electricity annually by 2030, rejecting massive amounts of waste heat.

Technological challenges
The primary technological barrier to recovery is the low temperature of data centre waste heat, making direct use or efficient storage difficult. Economically, advanced thermochemical storage materials remain expensive, and waste heat investments compete with heavily subsidized renewables.

From a regulatory perspective, there are also some key barriers: first, the lack of a clear European framework putting waste heat on a par with renewable energy, which increases financial risks for investors. Second, is the absence of flexibility mechanisms in the contractual market framework. This regulatory rigidity limits the economic viability of waste heat recovery solutions that depend on temporal flexibility.

These challenges are rapidly evolving. Updated regulations, such as the Energy Efficiency Directive (EED), now mandate waste heat recovery for data centres with an energy input exceeding 1 MW. Meanwhile, policy acceleration is also evident through the European Green Deal, Fit for 55 package, and revised Energy Efficiency Directive, which increasingly mandate waste heat recovery and establish data centres as critical infrastructure for urban energy systems.

Emerging technologies
Key new technologies to deal with data centra waste heat are emerging within THUNDER, or the Thermochemical storage Utilization eNabling Data centre seasonal Energy Recovery. This is a 4-year European Union initiative running until January 2028 which aims to develop sustainable waste heat recovery and storage.

THUNDER stands out for implementing seasonal thermal energy storage using Thermochemical Materials (TCM). This technology offers high energy density and near-zero thermal losses, enabling us to capture abundant summer heat and use it months later during winter.

By integrating these facilities with district heating networks (DHNs), using seasonal thermochemical storage, and 'Heat on Wheels' technology, using Phase Change Materials (PCM), the technology offers mobile storage which transports energy physically and bypasses the massive capital cost of building direct pipeline connections between data centres and urban heating networks.

THUNDER is also pioneering the integration of high-temperature heat pumps to elevate the waste heat's thermal value. These technologies are creating technical pathways that enable the flexibility needed to store and consume heat according to demand, helping to ensure profitability and mitigate initial barriers.

It is also tackling the issue of multiple guidelines. A major European priority must be aligning policies—such as the EED, RED, and EU Taxonomy—to formally equate waste heat with renewable energy sources, thereby reducing financial risks and encouraging investments. THUNDER directly addresses these priorities through an activity where we focus on evaluating the project's alignment with the EU Taxonomy, formulating policy briefs to communicate regulatory barriers to legislators.

In partnership with Veolia
As a partner in THUNDER, Veolia is working to validate solutions and technologies at its site in Varna, Bulgaria. On the business side, we are actively exploring new operational frameworks, such as the 'cooling as a service' concept, although final business models are still being evaluated to ensure optimal European replicability.



Technologically, we are integrating Seasonal Thermal Energy Storage using Thermochemical Materials (TCM), allowing us to store summer waste heat with near-zero losses for winter use. Furthermore, we are demonstrating the pioneering 'Heat on Wheels' methodology by using mobile Phase Change Material (PCM) containers to physically transport the recovered heat, providing a highly flexible solution to connect energy sources and consumers that are geographically distant.

We are currently coordinating pre-feasibility studies for 10 additional replication sites across Europe to expand the technology's footprint. Operationally, Veolia Energy Varna runs the district heating network (DHN) at the Bulgarian pilot site, where we provide our infrastructure to integrate the heat recovered from the Abilix data centre.

Thus, we actively contribute to designing business models, system optimization, and assessing the environmental impact and key exploitable results to guarantee commercial viability.

RINA leadership
We highly value our collaboration with RINA, the coordinator of the THUNDER consortium, and its leadership of this ambitious proposal.

RINA provides an essential technical and coordination structure to THUNDER, which combines with Veolia's wide ranging operational expertise. By proving that urban waste heat recovery can be scalable and profitable, we are reducing market uncertainties for both operators and investors across Europe.

BIOGRAPHY

Javier Martín Sanz is an Industrial Engineer, having graduated from the University of Valladolid (Spain) in 2002, and a Certified Measurement and Verification Professional (CMVP) since 2010.

He has developed his career in energy efficiency within the Technical Department of Veolia since 2009, where he has combined his work with the development of European research projects, serving as Director of Innovation Projects since 2021 in the fields of energy and waste.

Scan the QR code to learn more about **Veolia**

A revolution in the **textile industry**

The textile and fashion sector is experiencing a profound transformation driven by environmental, regulatory and technological pressures.

Companies are increasingly being called on to rethink their traditional production methods, as well as consumption models, in response to resource scarcity, evolving consumer expectations and new European policies.

Among the most relevant emerging trend is eco-design - involving lifecycle-based assessments, greater supply chain transparency and traceability, circular business models and the implementation of Extended Producer Responsibility (EPR) schemes.

There is also a growing focus on sustainable material sourcing, recycled and regenerated fibers, and digital tools capable of improving data quality and product transparency.

These changes are reshaping the industry toward a more integrated model where sustainability, innovation and competitiveness are closely interconnected.

My company, Yamamay, which is one of Italy's leading fashion-retail brands in lingerie, swimwear and nightwear, is addressing sustainability as a strategic and cross-functional priority integrated throughout its business model and value chain.

Since Yamamay was founded in 2001, we have worked to position the brand as a benchmark for transparency, product responsibility and ESG integration, embedding sustainability and responsible innovation in its business model.

Interview with **Barbara Cimmino**
Co-Founder, Yamamay



We are also working on these issues at EURATEX, the European Apparel and Textile Confederation, and Confindustria, Italy's association of manufacturing enterprises and services, where I am currently Vice President.

Yamamay has strengthened its own approach through a combination of research and development, eco-design principles, traceability initiatives and innovation processes.

Considerable effort has been dedicated to Life Cycle Assessment methodologies and digital tools aimed at improving product design and impact evaluation.

Product innovation increasingly focuses on responsible materials selected according to circularity and reduced environmental impact criteria. At the same time, Product ID Cards provide transparent and verifiable information regarding composition, supply chain and environmental impacts.

Regarding our supply chain, Yamamay has completed the mapping and traceability of first-tier suppliers and progressively extended due diligence activities to upstream actors through ESG-based methodologies aligned with evolving European requirements.

This approach supports greater transparency and resilience while promoting more responsible sourcing practices.

Alongside product innovation, Yamamay is also investing in energy efficiency projects and broader initiatives designed to measure emissions across the value chain and defining and supporting long-term decarbonization objectives.

Circula-TEX project driving progress
Circula-TEX, a European project funded by the Horizon Europe programme and coordinated by RINA, represents an important initiative supporting the European transition toward a circular textile system. The project contributes to redesigning traditional value chains by creating new models that facilitate circularity, product traceability and end-of-life management.

Within this framework, Yamamay is working on technological solutions capable of supporting future EPR mechanisms and improving waste management processes.

The project contributes to moving from a linear model toward a circular one by creating systems that facilitate material recovery, recycling and responsible end-of-life treatment.



It also aligns with broader European ambitions to promote circular economy principles and strengthen collaboration among stakeholders throughout the textile ecosystem.

Circularity is therefore approached not only as a product issue but also as a systemic transformation involving supply chains, technology and new responsibilities for producers.

Collaboration a key element
Collaborations and participation in shared initiatives play a strategic role in accelerating sustainability innovation. Working within broader ecosystems allows companies to exchange expertise, anticipate regulatory developments and co-create new solutions capable of addressing complex challenges.

Participation in associations, research initiatives and innovation networks creates opportunities for open innovation, access to knowledge and stronger dialogue among industry stakeholders.

These collaborations support the development of more resilient and future-oriented business models while facilitating experimentation and implementation of new sustainability approaches.

European projects and collaborative initiatives also offer opportunities to validate methodologies, strengthen technical capabilities and create synergies capable of accelerating the transition toward circular and more sustainable production systems.

Through cooperation, sustainability becomes not only a compliance exercise but also a driver of innovation and competitive advantage.

BIOGRAPHY

Barbara Cimmino is Co-Founder of Yamamay, one of Italy's leading fashion-retail brands in lingerie, swimwear and nightwear.
Since the company's foundation in 2001, she has played a central role in positioning the brand as a benchmark for transparency, product responsibility and ESG integration.
Barbara is also Vice President of Confindustria with responsibility for Internationalization and Investment Attraction, and Vice President of EURATEX, the European Apparel and Textile Confederation.

In addition she is a Board Member of the Italian Trade Agency (ITA/ICE) and SIMEST, and Vice President of Comitato Leonardo, as well as a member of Apheon's Board of Senior Advisors, the LUISS Business School Corporate Advisory Board and the Advisory Board of the UCL Centre for Sustainable Business.
Barbara received the EY Entrepreneur of the Year Award – Fashion & Design in 2017, the ASFOR-ISVI Excellence Innovation Award in 2023 and was recognized as the Sustainability Leader of the Year Award from the UCL Centre for Sustainable Business in 2025.

Scan the QR code to learn more about **Yamamay**

Redefining Rome **for the future**

Interview with **Michele Franzese**
Founder, SCAI Comunicazione



Rome Future Week, our pioneering event which aims to transform and redefine Rome for a future of innovation and technology, is increasingly acting as a connector between communities that often move in parallel: start-ups, corporations and institutions.

In Italy and Europe, one of the most relevant trends we are seeing is a clear maturation of open innovation. It is no longer treated as a special, isolated initiative, and in many companies, it is starting to integrate with product and sales functions. This will ultimately assist in its adoption, bringing measurable outcomes, industrial requirements and real go-to-market paths.

Industrial transformation is becoming the real engine of innovation priorities, and ecosystems that connect universities, technical institutes, corporates and public stakeholders will move faster than those that rely only on funding and acceleration.

Rome is traditionally institutional and cultural, but it is now progressively redefining itself as a city where industrial innovation and entrepreneurship can grow. We are seeing a stronger alignment of public resources and strategic projects, with more effective public-private governance than in the past. Rome's opportunity is to become a "city-scale platform" where innovation is not only discussed, but coordinated and tested through a network of places and actors.

Removing barriers to progress
In our experience, the main barrier to scaling has not been only capital. In Rome, very often the bigger issue was the lack of sufficiently ambitious start-up projects tightly connected to real industrial needs. When problems are not industrial-grade, capital struggles to find its way, and collaboration remains fragmented.

Another recurring barrier is the last mile between a good solution and real adoption: long decision cycles, procurement complexity, regulatory constraints and integration challenges. As more industrial players engage with initiatives like Rome Future Week, the conditions improve for better matchmaking, structured pilots, clearer KPIs, and trusted intermediaries.

Building compliant solutions
Within this kind of ecosystem-building effort, a global engineering and certification company like RINA has a natural and strategic role. It represents an essential dimension of innovation that is often underestimated: translating ideas into reliable, safe, compliant and scalable solutions.

In many sectors, engineering, certification and standards are enabling conditions for adoption and market access. RINA can therefore operate as a bridge between start-ups and industry, helping start-ups understand real constraints and required standards, and helping corporates and public stakeholders evaluate innovation with method and credibility.

This is also why RINA's Open Innovation Hub in Rome has strong strategic value. For the city, it is a concrete signal that Rome can host industrial innovation, not only discuss it. For Italy's broader industrial transformation, it can help connect local talent and entrepreneurial energy to global industrial networks, while strengthening capabilities around validation, compliance and scale.

Energy transition a top priority
The strongest potential for collaboration between start-ups and established players like RINA lies in domains where innovation must be both fast and dependable. This includes energy transition and sustainable infrastructure, because solutions require engineering rigour, standards and verification to scale safely.

Digital transformation is equally central, especially where critical systems, cybersecurity, data governance and interoperability are involved. Smart cities offer large opportunities when approached pragmatically, focusing on measurable improvements in mobility, maintenance, resilience, safety and citizen services. Across these areas, data and AI will be powerful accelerators.

A multi-year approach
Looking ahead, Rome can strengthen its role within European innovation networks by leveraging its convening power and institutional connectivity through structured, multi-year collaborations. The partnerships that matter most are not episodic.



They are alliances between corporates, hubs, universities and public administrations that co-design programs, share infrastructure and datasets where possible, and create stable pathways for talent and projects. Rome Future Week can work as a platform that makes these collaborations visible and actionable.

Beyond Italy, the Mediterranean and African regions are increasingly central to Europe's future, from energy and logistics, to climate adaptation, urbanisation and infrastructure. Rome has a natural potential to act as a bridge, but the approach needs to be pragmatic and mutually beneficial: joint challenges, shared pilot projects, talent exchange and capacity-building in sectors such as sustainable infrastructure, energy systems, ports and logistics, and digital public services.

In this scenario, Rome Future Week can provide the convening and visibility layer that attracts diverse stakeholders and creates momentum, while RINA's Open Innovation Hub can provide the technical and industrial layer that makes collaboration credible, operational and sustainable over time.

BIOGRAPHY

Michele Franzese is a Creative Director, impact entrepreneur and event maker. Michele has spent the past 20 years helping companies communicate through SCAI Comunicazione, an agency specialised in events and strategic communication. In 2021 he published "Human Digital Events" (Maggioli) and in 2024 he edited the university handbook "Essere Startupper" (McGraw Hill). He regularly teaches and speaks on entrepreneurship and innovation in conferences, courses and Master programs, and he is currently a lecturer in Startups and Spin Offs at Link Campus University in Rome. In 2023 Michele launched Rome Future Week®, a future-focused format born in Rome that is evolving into a national ecosystem, with upcoming stops in Turin, Florence, Taranto and Cagliari. His next challenge is to explore and share the opportunities and critical questions emerging around artificial intelligence.

Scan the QR code to learn more about **SCAI Comunicazione**

Sustainable water management **in Greece**

Across Europe, utilities are increasingly expected to recover value through water reuse, nutrient recovery, energy optimization, and carbon reduction. In Attica, Greece, where drought remains a pressing challenge, advancing water reuse and circularity is a key part of the solution.

Resource valorization, water and energy conservation and advanced monitoring and water/waste-water quality control are central pillars of EYDAP's strategy. A strong example is our work within the "RHE-MEDiation" pilot project, part of the EU's Horizon Europe program, which integrates remediation technologies with smart monitoring systems while connecting them to broader digital frameworks and governance approaches.

RHE-MEDiation offers a broader solution
RHE-MEDiation is particularly innovative because it does not treat remediation as a standalone technical exercise. Its innovation lies in combining microalgae-based wastewater treatment, smart chemical pollution monitoring, community engagement and replication planning within one integrated framework.

The project is designed around three pilot sites and additional associated regions, with the explicit goal of testing not only technical efficiency, but also transferability, governance readiness and long-term uptake. That makes it broader than many technology-centered initiatives that focus mainly on process performance.

EYDAP is leading all three case studies and the demonstration of the pilot systems for tertiary wastewater treatment based on microalgae solutions, together with the evaluation of their benefits and the involvement of local communities. We are also responsible for setting up a monitoring system based on smart multi-sensors for pollutant detection and measurement.

Interview with **Giorgos Sachinis**
Director of Strategy and Innovation, EYDAP



In practical terms, our work is closely connected with the Greek demo site at the Thriasio Wastewater Treatment Plant, where the microalgae-based photobioreactor and related monitoring technologies have been operational since November 2024.

Microalgae-based systems and community engagement are key to the project. Microalgae-based systems offer a more circular approach to wastewater treatment but will only gain traction if their performance is visible, measurable and understandable: monitoring technologies provide that evidence base. Community engagement is equally important, especially in Greece, where water reuse, coastal protection and circular economy measures must be socially credible as well as technically sound.

Challenges still exist
From EYDAP's perspective, a main technological challenge is moving from promising pilot performance to robust, year-round operation. Microalgae-based tertiary treatment must cope with fluctuations in hydraulic load, nutrient composition, light, temperature and competing microorganisms, while also proving reliable removal of priority and emerging pollutants. Monitoring, automation and process control are therefore not optional; they are central to operational confidence and cost control.

Another challenge is the scale of operation of microalgae-based technologies. EYDAP operates in a dense urban metropolis. The types of technologies it can apply depend on parameters such as load capacity, spatial footprint, cost-benefit comparison between decentralized and centralized approach etc.

Economically, scale-up still depends on demonstrating a competitive total cost of ownership versus conventional tertiary options, including land footprint, harvesting, biomass handling and maintenance.

In Greece, utilities of all sizes are under growing pressure to improve water resilience and environmental performance. Regulatory momentum at EU level is helping, but wider deployment still requires clearer compliance pathways, performance benchmarks and public-sector confidence that innovative nature-based systems can be integrated into mainstream wastewater infrastructure.

Integrating into a decision framework
Looking beyond the pilot, EYDAP's priority is to translate results into a utility-grade decision framework: where these systems make sense, under what boundary conditions, with what monitoring requirements and at what cost-performance ratio.



There can be opportunities in using pilot evidence to inform future tertiary treatment upgrades, water reuse strategies and site-specific circular solutions in Greece. The project's focus on scalability and associated regions is especially useful in this respect.

The main barriers remain familiar: proving long-term reliability, maximizing load capacity, securing investment confidence, integrating innovation into established asset planning cycles and ensuring that skills and maintenance models are in place. Our approach is therefore pragmatic.

We do not view pilot success as automatic scale-up; we view it as the evidence base needed to decide where microalgae-based and digitally monitored solutions can become part of mainstream practice in Athens and the wider Attica region.

Becoming part of a wider system
The collaboration with RINA is valuable because it connects local pilot implementation with strong project-wide coordination, systems thinking and exploitation planning.

RINA contributes not only to management, but also to the development of the data ingestion system linked to EMODnet, the RHE-MEDiation Hub ecosystem, communication activities and sustainability-oriented assessments such as social and circular analyses.

This ensures that the pilot work is embedded in a wider framework for validation, dissemination and future uptake. In projects like this, innovation is strongest when technical results, governance lessons and data systems evolve together, and the collaboration with RINA has supported exactly that integrated approach.

BIOGRAPHY

Giorgos Sachinis is the Head of Strategy and Innovation of EYDAP, the Athens Water Supply and Sewerage Company. He is a Board Member of Water Europe and a member of the Ad-hoc Task Group on Water Scarcity and Droughts within the EU's Common Implementation Strategy (CIS).

He has worked in EYDAP since 2004 and has served in the Policy Advisory Committee of Water Europe and the Steering Committee of GWOPA UN-Habitat. He is a Civil and Environmental Engineer (MSc UCAL Berkeley, BSc Duke University).

Scan the QR code to learn more about **EYDAP**

Tackling **data centre challenges**



The data centre sector is currently facing several structural challenges. These include rapidly growing energy demand, increasing pressure to reduce carbon emissions, complex permitting processes, and the need to guarantee high levels of reliability in an always-on digital environment.

At the same time, operators must manage technological evolution, from new cooling paradigms to digitalisation and cybersecurity, while maintaining cost efficiency and scalability.

Within this evolving context, RINA offers a technical partnership to ensure clients develop efficient and sustainable data centre infrastructure.

Operating across a wide spectrum of engineering, advisory and certification services, RINA integrates multidisciplinary expertise to support data centre projects throughout their entire lifecycle.

This end-to-end approach enables us to contribute to the definition, delivery and optimisation of complex infrastructure, from early-stage investment decisions to long-term operations and asset management.

As a multidisciplinary partner, RINA offers guidance along the full data centre value chain. At the early stages, RINA supports investors and developers through feasibility studies, site selection and technical due diligence, addressing key aspects such as power availability, cooling strategies, regulatory requirements and environmental constraints.

These ensure that investment decisions are based on solid technical and financial foundations, aligning project objectives with performance and long-term sustainability.

As projects move into the design phase, RINA can leverage engineering capabilities across civil, structural, mechanical and electrical disciplines: this includes the development of power and cooling systems, substations, and building management infrastructures, as well as advanced studies such as computational fluid dynamics, electromagnetic compatibility and digital twin modelling.

Through these activities, RINA aims to optimise efficiency, scalability and resilience, addressing the growing complexity of digital infrastructure.

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As the project moves into the construction phase, RINA is on hand to provide project management and independent supervision services, monitoring progress, controlling costs, managing contracts and ensuring alignment with design specifications and quality standards.

Once operational, data centres require continuous monitoring and optimisation. Here, RINA can offer the full range of integrity and maintenance services, combining condition-based monitoring, predictive maintenance and advanced diagnostics to improve reliability and minimise downtime. These capabilities safeguard business continuity, a critical requirement for mission-critical infrastructure.

RINA also supports the data centre industry through dedicated learning programmes, delivering customised training, masterclasses and hands-on learning experiences that help operators to develop the skills needed to manage increasingly complex digital infrastructure.

Sustainability must be central to data centre strategy, and RINA can help clients improve their energy efficiency, optimise thermal performance and align with certification schemes such as LEED, BREEAM and Envision.

RINA can also help define ESG-aligned strategies, enabling operators to reduce environmental impact and meet evolving regulatory expectations. In parallel, RINA provides testing, inspection and certification services to ensure compliance with international standards, including those related to reliability, information security and business continuity.

RINA can shape next-generation data centre infrastructure, ensuring energy-efficient and flexible facilities, that offer reliable and sustainable digital services and ecosystems.

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Renovation planning: **the BUILDCHAIN Approach**

The European Union-funded BUILDCHAIN project is set to contribute to the digital transformation of the construction sector by developing tools that significantly improve how renovation projects are planned and managed.

One of its main outcomes is the Deep Renovation Workflow Management Tool, developed by RINA, which focuses on a challenge that is often underestimated in renovation projects: user disruption.

The tool has been mainly tested in school buildings located in Florence; but it has been designed with a much broader application in mind. It can be used across different types of facilities, such as offices, and public buildings, where renovation works can have a strong impact on daily activities. When these spaces are partially or fully unavailable, the consequences are not only technical, but also economic, social, and logistical for the people who rely on them.

The tool combines construction scheduling with disruption modelling, allowing users to simulate renovation scenarios and understand their impact before starting the construction works. It evaluates disruption across four main areas: indoor environment, utilities, external access and logistics. Each activity is assessed through a structured scoring system, and the results are then visualized through gantt charts, heatmaps, and automated reports.

This makes it easier for project teams to compare different scenarios, improve planning, and reduce unnecessary disruption. The tool is designed for a range of stakeholders, including project managers, facility managers, administrative teams, and even building occupants. Depending on the role, users can access different features and levels of information, making the tool flexible and practical in real project environments.

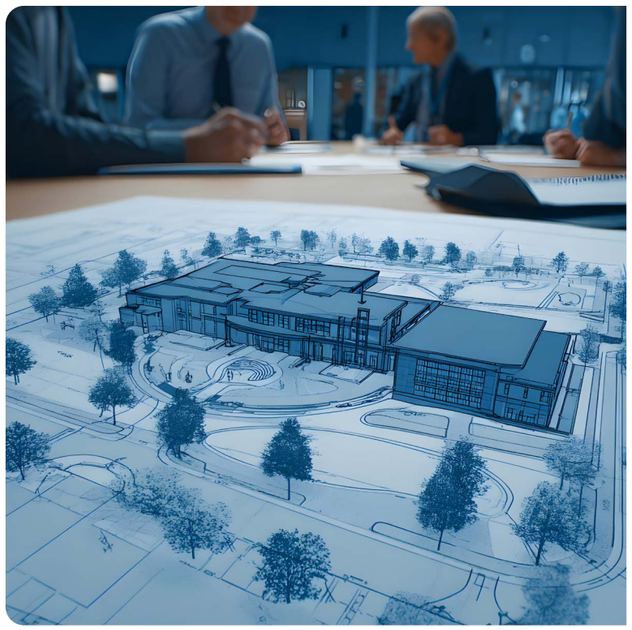
The work carried out within BUILDCHAIN has also gained external recognition. The project was shortlisted for the Engineering Talent Awards 2025 in the "Innovation of the Year" category. The event, held in Manchester, brought together a wide range of professionals and organizations working on innovative engineering solutions.

BUILDCHAIN was presented alongside other strong initiatives, ranging from carbon removal technologies to safety solutions and biomedical research. The project was represented at the event by RINA's Jairis Arleen Alvarez Trujillo, who played a key role in the development of the tool, together with colleague Enrico Scoditti as the main developer. While BUILDCHAIN did not win the final award, being shortlisted in this context is already a significant achievement and reflects the relevance and impact of the work carried out.

More importantly, this recognition highlights a shift in how renovation projects are being approached. Instead of focusing only on cost and time, there is increasing attention on how work affects people. By making disruption measurable and part of the decision-making process, the BUILDCHAIN tool supports more sustainable and user-focused renovation strategies.

Overall, the project shows how digital tools can help bridge the gap between technical planning and real user needs, contributing to a more efficient and human-centered construction sector.

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RINA's Call 4 Startup: **a new engine for growth**

Open innovation has become a strategic imperative for companies operating in increasingly complex and fast-changing markets. At its core lies the belief that valuable ideas, technologies and business models can originate beyond corporate boundaries.

For RINA, this is not simply a theoretical concept, but a concrete investment approach aimed at integrating cutting-edge technologies, accelerating development cycles and delivering real value to clients. As a knowledge company made up of about 7,000 professionals, RINA represents fertile ground for open innovation: the combination of deep internal expertise and external technological dynamism is precisely where new value is created.

Within this context, in October 2025 RINA launched its first Call 4 Startup round, designed to bridge the gap between the company's industrial expertise and the disruptive potential of emerging ventures. The goal is to build meaningful partnerships that can transform innovative concepts into scalable, market-ready solutions, through a collaborative model rather than a traditional client-supplier relationship.

The 2025 edition focused on asset monitoring, inspection and supervision across industries, seeking solutions capable of operating in complex and hostile environments, enabling continuous monitoring and predictive maintenance, while ensuring compliance with cybersecurity and interoperability standards.

Following a rigorous evaluation process, three startups, Pipein, Suncubes and Therness were selected. This outcome was the result of a coordinated effort involving multiple functions across the company. The Innovation Team led the process, supported by technical experts who carried out in-depth assessments of each proposal, while top management made the final selection among the shortlisted finalists. This collective approach ensured both strategic alignment and technical robustness.

After signing Memorandums of Understanding (MoUs), the selected startups have entered the PoC (Proof of Concept) design phase, collaborating side by side with RINA's technical experts to define use cases and validate technical feasibility. A key asset RINA brings to this phase is access to its laboratories, demo centers and real industrial test environments, where startups can validate their solutions under actual operating conditions and progress along the Technology Readiness Level (TRL) scale, a critical milestone on the path to market adoption.



Although the initiative is still ongoing, the first Call for Startups has already yielded strong initial outcomes, as reflected in the high number of applications (101), their alignment with RINA's priorities, and their overall quality. The significant engagement within RINA from engineers, specialists and corporate functions, who have actively contributed to evaluation and selection, has reinforced a shared culture of innovation across the organization.

Building on these positive results, RINA's Innovation Team is already working on the next Call for Startups, which will be announced in the coming months. Beyond organizing its own calls, RINA is also expanding its presence in the broader innovation ecosystem, participating as a partner in calls promoted by other organizations, and building structured relationships with accelerators, venture funds and innovation hubs. The objective is to make open innovation a recurring, multi-channel process. That is, not a standalone project, but a permanent engine for growth.

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When ports blink: **turning resilience into action**

Imagine a port at full throttle, a complex ecosystem that powers daily life.

Now imagine the same port, but not functioning. A storm surge floods a critical substation, a key access route fails, terminals slow, ships queue, and delays cascade through different activities. That moment, when a port "blinks", is what resilience is about: keeping critical services going, minimizing downtime, and protecting confidence in decisions.

Evidence shows that ports are increasingly exposed to complex and interconnected risks, with 86% of the world's ports facing potential risk from more than three simultaneous natural hazards. Indeed, natural hazards such as hurricanes, typhoons, floods and droughts are intensifying, with forecast annual infrastructure losses estimated at around $7.6 billion.

Looking ahead, investments in resilience are projected to reach between $223 billion and $768 billion by 2050, with approximately 70%–80% allocated to physical upgrades and 15%–20% to digital and operational resilience.

Because risks are intensifying while infrastructure systems are becoming more interconnected, one failure rarely stays isolated in a port setting. Energy, transport, logistics and digital systems are tightly coupled, and disruption propagates fast.



The challenge is clear: how do ports move from reactive risk management to proactive, data-driven resilience strategies, and how we can support this transition by turning hazard data into decisions that make sense for operations, finance, and strategy?
To address this, RINA has developed the Port Resilience Platform, an integrated digital solution that supports port authorities and terminal operators in managing risk, improving operational continuity and enhancing long-term asset performance.

The platform combines advanced digital technologies with RINA's multidisciplinary expertise in infrastructure, safety and asset management. By integrating environmental, operational and asset data, it provides a real-time, holistic view of port systems, enabling stakeholders to identify vulnerabilities and monitor critical assets more effectively.

A key differentiator of the platform is its predictive capability. Through scenario-based simulations, users can assess the impact of extreme events, infrastructure failures or operational disruptions before they occur. This enables more informed decision-making, optimized maintenance strategies and reduced downtime, ultimately improving both resilience and efficiency.

Designed to be scalable and adaptable, the platform can be deployed across a wide range of port environments, promoting collaboration among stakeholders via a shared digital environment to support strategic planning.

In line with RINA's innovation approach, the platform is being developed through pilot projects and collaborations with key partners, ensuring that technology is aligned with real operational needs and delivers tangible value.

As ports navigate the transition toward more sustainable and digitalized systems, resilience will be a key competitive factor. Digital tools thus will play an essential role in enabling ports to anticipate risks, optimize operations and build a more robust and future-ready infrastructure.

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Maritime training **goes digital**

As the maritime industry undergoes drastic change, learning and development among professionals must also adapt. Rapid technological advances, new regulatory frameworks, ambitious sustainability goals, and increasingly digital operations are reshaping competency requirements across the sector. In this environment, continuous learning is no longer optional, but a necessity.

At the same time, the maritime workforce is becoming increasingly multidisciplinary. Maritime professionals both onboard and ashore are expected not only to understand traditional operational procedures, but also digital systems, cybersecurity measures, environmental compliance, and data-driven decision-making. This shift requires learning approaches that are more agile, accessible, and capable of evolving alongside industry demands.

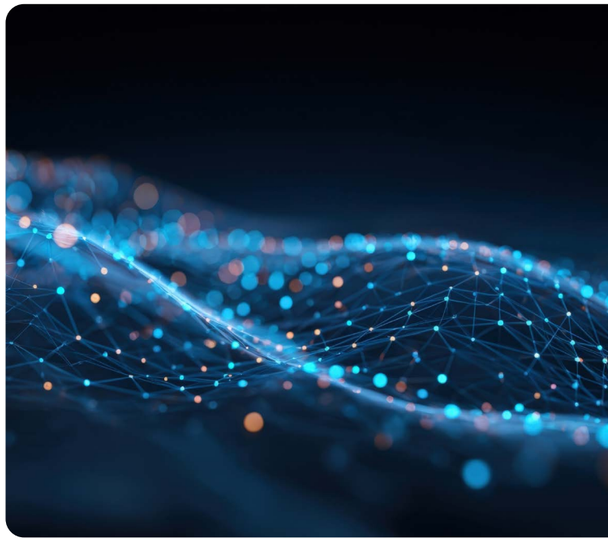
To support this transformation, RINA launched a new Learning Management System (LMS) in May 2026, designed to create a modern and scalable digital learning ecosystem for our clients and partners worldwide.

The LMS represents more than a new training platform. It is a strategic step towards building a flexible learning environment capable of supporting multiple training formats, including e-learning courses, webinars, instructor-led sessions, blended learning paths, serious gaming and future AI digital learning programs.

One of the key advantages of the new system is accessibility. Maritime professionals often operate across different countries, time zones, and working conditions. Digital learning solutions help reduce geographical barriers and allow learners to access training content at the time and pace most suitable to them. This flexibility supports a more inclusive and continuous learning culture.

The platform will also assist in centralizing knowledge and improving training management. Learners will have a single point of access to training activities, learning materials, certifications, and progress tracking. It will also offer administrators and instructors improved visibility and reporting into how learners engage and develop their competencies.

The introduction of the Learning Management System also creates opportunities for innovation in learning methodologies. Future developments may include interactive educational modules, microlearning content, multimedia resources, competency-based learning journeys, and data-driven insights to better understand training needs and learners' behaviour. These technologies can help create more engaging and personalized experiences, encouraging higher participation and knowledge retention among learners.



Learning in the digital age becomes more and more vital in sectors where knowledge must continuously adapt to new technologies and operational challenges, such as the maritime industry. By investing in a modern learning infrastructure, RINA aims to support lifelong education and contribute to the development of skills that will shape the future of the industry.

The launch of the new Learning Management System (LMS) marks the beginning of this journey, by creating a connected, flexible, and innovation-driven learning experience. By embracing digital learning foundations today, RINA aims to help maritime professionals and organizations remain resilient, competitive, and prepared for the challenges of tomorrow.

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Making heritage buildings **smarter**



Historic buildings and their managers are often seen as resistant to change. The architectural value and cultural significance of the buildings, as well as regulatory constraints, often make deep renovation difficult, even when their energy performance requires urgent improvement.
Yet these same buildings are central to Europe's urban identity and public life, meaning they cannot be left behind in the green and digital transition.

SMARTeeSTORY has taken up the challenge to prove that innovation can unlock a new path to sustainability for heritage buildings, without compromising their character.

Funded by Horizon Europe, SMARTeeSTORY focuses on the deployment of advanced Building Automation and Control Systems tailored to historic non-residential buildings. Rather than relying on invasive structural interventions, the project demonstrates how digital intelligence can optimise existing systems, improve indoor conditions, and reduce energy use through smarter operation.

At the heart of the project lies an integrated and interoperable platform capable of managing complex building services in a dynamic and predictive way. SMARTeeSTORY combines physics-based modelling with data-driven intelligence to better understand how buildings behave over time.
This hybrid approach allows the system to forecast energy demand, anticipate comfort needs, and support optimisation-based control strategies for heating, cooling, ventilation, and other technical services. The result is a more responsive building environment, able to adapt in real time while preserving operational reliability.

RINA plays a central role in this transformation. As project coordinator, RINA is supporting both the strategic direction and the technical implementation of SMARTeeSTORY, contributing to the development of advanced control algorithms and to the digital software architecture that hosts them. As part of this effort, RINA has merged two of its innovative products: QPRO2, a modular software platform for management, integration and analysis of heterogeneous data and RECENTRE, a tool for the optimized control of complex energy systems.

Another important contribution is linked to the Smart Readiness Indicator (SRI). Together with Tecnalia, RINA has helped develop a web-based assessment tool aligned with the official European methodology for expert SRI calculation. The tool enables users to evaluate how ready a building is to integrate smart technologies, define energy and environmental targets, and identify the most relevant pathways for improvement.

The project's impact is already visible in its pilot applications, including Riga City Hall, the Faculty of Architecture at Delft University of Technology, and the Royal Chancellery of Granada.

SMARTeeSTORY shows that even highly sensitive and protected buildings can benefit from intelligent monitoring, automation, and optimisation. It also confirms a broader message: digitalisation in the built environment is not limited to new assets or large-scale refurbishment.

It is a compelling example of how Europe's past can be preserved while being equipped for the demands of tomorrow.

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Innovation+ | NOVEMBER 2026

NH3craft: **storing ammonia on board ship**

In the European Union, maritime transport is a substantial CO_2 emitter, representing 3% to 4% of the bloc's total CO_2 emissions, and rising. The European Green Deal Strategy aims to achieve a 90% reduction in emissions by 2040, thus drastic action is required to move towards a smarter, greener transport system.

The targets set out in the International Maritime Organization's (IMO) initial strategy for Greenhouse Gas (GHG) emission reduction from international shipping are expected to be achieved by the combination of: alternative zero carbon/renewable fuels, energy efficiency, and systemic change in global trade dynamics.

The phase-out of fossil fuels and the transition to zero carbon fuels is not straightforward and substantial investment will be required. Zero carbon fuels require the development of new solutions that will involve new technologies, logistics and operations.

Ammonia (NH_3) is a promising alternative fuel for the decarbonisation of the sector. However, it presents challenges when it comes to storage due to the increased volume capacity needed on board ship compared to equivalent usage fuel oil. It also has a high toxicity. Therefore, it will be essential to identify more efficient solutions for storing ammonia on board vessels.

The NH3CRAFT project has successfully developed and demonstrated tangible solutions for the large-scale storage of ammonia as an onboard fuel.

The project was successfully concluded in May 2025 with the following key outcomes:

- Complete design and technical specification for 750m^3 NH_3 fuel storage on board a General Cargo Vessel
- Conceptual design of a similar application in five different vessel types (Bulk Carrier, Tanker, Containership, RoPax and Double ended Ferry)
- Qualitative and Quantitative Risk Assessment for all studies
- New technology qualification issuance for both the Tank Storage and Auxiliary of the aforementioned design received by ABS

RINA's Marine R&D team played a key role in this project. Throughout the process, Marine R&D team was closely involved in the concept design of the demonstrator and the desktop studies, as well as the safety risk assessment of the new designs. Based on the safety assessment guidelines laid down by ABS, RINA oversaw and supported the engineering design, manufacturing, and testing activities. The team was also responsible for informing the project consortium of relevant regulatory developments, and also arranged for the consortium to present the NH3CRAFT ammonia dispersion study to the IACS Safe Decarbonisation Panel members during the Association's 2024 Spring meeting.

A further outcome of NH3CRAFT was a comprehensive documentation of the risk and safety assessment conducted during the project. This will serve as the basis for strengthening the relevant RINA technical rules and for developing clear safety guidelines for the onboard use of ammonia. The resulting rules will establish a new certification standard for the proposed technologies.

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