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Innovation+

RINA'S MAGAZINE ON INNOVATION

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Achieving innovation at scale



The complexity of today's world is growing exponentially, and the transformation of our economy, infrastructure and energy is now unavoidable. The ability to deliver innovation at scale will be what sets the successful leaders of this transformation apart.

At RINA, our goal is not simply to innovate, but to innovate at scale. Achieving it has several implications.

First, it means we need to weave creativity, agility, and technological excellence into the fabric of RINA's global operations. Ideas created in one part of the company, say in one of our dedicated Open Innovation Hubs in Singapore or Rome, can be rapidly tested, validated, and deployed across our entire ecosystem - from Abu Dhabi to Rio de Janeiro.

Thus, we are building a culture where innovation is not confined to Research & Development teams, but is a shared responsibility across every business unit, country and role.

Achieving scale also demands structure. RINA has invested in a range of cross-functional communities, such as Open Innovation Hubs, the R&D&I Communities and the AI Factory, aimed at bringing together clients, partners, and our own experts to co-create solutions.

Such co-operation will be a key catalyst for the transformation needed. Underpinning this work is RINA's Strategic R&D&I Plan. Innovation drives RINA's growth, and the growth of our clients. In order to consistently deliver top-tier innovative services to our clients, the Plan has identified R&D&I trajectories in a set of key domains for our projects.

These projects are developed in collaboration with key stakeholders, including technology providers, pilot end users, public authorities, and civil representatives. Through our Open Innovation Hubs, the R&D&I Communities and the AI Factory, we are fostering collaboration across disciplines and geographies.

As we look toward 2030, our ambition is clear: to expand our global footprint, and in doing so lead the transition toward a more sustainable, digital, and resilient future. Innovation at scale - powered by a structured, strategic R&D&I plan - is how we will get there.

Carlo Luzzatto
CEO & General Manager, RINA



The Strategic R&D&I (Research, Development and Innovation) Plan launched by RINA is more than a roadmap. It defines who we are as innovators, where we want to go, and how we will get there.

With ten strategic domains - from Energy Transition, to Maritime & Blue Economy, and AI & Digitalisation - the plan aims to align our research efforts with the most pressing global challenges.

To ensure successful execution of the plan, RINA has built a robust implementation framework around three pillars: Governance, R&D&I Communities, and Open Innovation Hubs (OIHs).

The R&D&I Communities are the beating heart of our innovation. These cross-functional, cross-geographical agile groups bring together researchers, engineers, business developers, and domain experts in order to share knowledge, align priorities, and co-develop solutions.

They are where ideas are challenged, refined, and transformed into tangible outcomes. Each community is empowered to shape its own roadmap while contributing to the broader strategic vision.

Complementing these communities are our Open Innovation Hubs, which serve as physical and digital platforms for co-creation, experimentation, and knowledge transfer. Located in key global regions - Singapore, Leatherhead, Abu Dhabi, Rome, Athens, Rio, and beyond - each hub is tailored to local needs while being connected to a global network. They host learning and other services for the local ecosystem, including testing facilities and AI-driven demo centers. They are where our strategic partnerships take root and where our Key Exploitable Results (KERs) are transformed into real-world impact.

We have also created our AI Factory: an innovation lab made up of cross-functional teams of professionals

Building the future, one hub at a time

from various business areas. Its goal is to drive digital transformation by optimizing existing services and processes, as well as develop new digital solutions powered by artificial intelligence.

These Hubs and Communities are not isolated initiatives. They are integrated into our broader industrial plan, with clear KPIs, business models, and community engagement strategies. Together, they ensure that innovation is not only scalable but also sustainable and inclusive.

Our vision is bold, but it is built on realistic and achievable concepts. With the Strategic R&D&I Plan as our compass, the R&D&I Communities as our collaborative force, and the OIHs as our engines, we are not just imagining the future, we are building it.

Daniele Calderoni Parronchi
Chief Strategy & Innovation Officer, RINA

Innovation in motorcycling

Staying competitive in a highly driven sport such as motorcycling is essential. In this field, and any field where excellence is the goal, innovation is not an option, it's a necessity.

Aprilia Racing is one of the most successful brands in motorcycle racing history with 54 world titles to its name. A 100% Italian manufacturer based in Noale just west of Venice, Aprilia Racing has registered over 298 victories in the MotoGP World Championship, the equivalent of Formula 1 for the motorcycling industry. With these results, it is the most successful European motorcycle racing team in history.

The 2025 season marked the beginning of a new era for the company, with a major technical evolution of the RS-GP, the four-stroke V4 Prototype motorcycle series developed by Aprilia and in use since 2015.

We are looking forward to how the latest innovative version of our race winning motorcycle, the RS-GP25, which has been honed with the assistance of our partners including RINA, performs.

When it comes to innovation, RINA and Aprilia Racing share the same vision.

To innovate means embracing the new, even when it is not fully understood. It takes an open mind and a 'what if' and 'can do' mindset - something that is deeply ingrained in Aprilia's DNA, and is also fully present at RINA. To achieve our goals, we must move forward together on a path that is not always straightforward, but full of obstacles and unexpected turns.

It is precisely this shared spirit, and relentless drive to raise the bar, that enables us to go further. Sometimes you need to pause and reassess - but that is part of the process. It is what drives growth, and ultimately, excellence."

As Head of the Vehicle Department, I vividly remember the first meeting with RINA: I proposed projects and ideas that were highly ambitious - even by my own standards - and with very high stakes. They were real challenges, but we knew we wanted to take them on.

We needed a top-tier partner, capable of providing the technical support required - and we found that in RINA. Their expertise, combined with genuine human values that came across from day one, allowed us to begin a journey that is still ongoing. This is why we truly hope to continue this collaboration with RINA for a long time: for us, it holds strategic importance.

In practical terms, the partnership opens up many opportunities: from software development to mechanical engineering, from hydraulics to advanced materials. Having access to the breadth of expertise and knowledge that RINA brings to the table allows us to improve, to innovate, and to make our product increasingly competitive.

Since its inception in 2023, the collaboration between RINA and Aprilia Racing has already resulted in advancements across multiple areas, including advanced performance data analysis, the creation of an innovative performance monitoring system, and the development of solutions to reduce the weight of motorcycle adhesives.

RINA brings key technological know-how from a variety of sectors, including cutting edge sectors such as the aerospace industry. This enables us to apply skills from other areas to bring and achieve new standards in motorsport.

The 2025 season saw the exciting arrival of 2024 World Champion Jorge Martín to the Aprilia team, as well as one of the best Italian talents, Marco Bezzecchi.

We look forward to RINA's continued support as we push the limits of performance and innovation on the track.



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learn more about
Aprilia Racing



BIO.

Marco de Luca is Head of the Vehicle Department at Aprilia Racing, the racing factory team of Aprilia which competes in the highest class of motorcycle road racing, the MotoGP World Championship.

Marco has held the position since 2019, and brings over 30 years of experience in motorsport and the automotive industry to the role. At Aprilia Racing, he has contributed his outstanding technical expertise developed in both four-wheel motorsport and high-performance automotive engineering. In particular, Marco has played a key role in the development of RS-GP, the four-stroke V4 Prototype motorcycle series developed by Aprilia which has been used by the team in the MotoGP World Championship since 2015.

Marco began his career in 1990 with the Minardi Formula 1 team and evolved through roles of increasing responsibility at BENETTON Formula Ltd, Ferrari (Formula 1 and Gran Turismo), Lamborghini Automobili, the HWA AMG-Mercedes DTM Team, and McLaren Automotive.



RINA and Aprilia Racing deepen partnership
In March, RINA and Aprilia Racing renewed their successful technical partnership for another three seasons. In doing so, the partners continue to push the boundaries of innovation at the highest level of motorcycle racing. In particular, RINA is working on improving the performance of Aprilia Racing's MotoGP bikes by refining setup strategies and analysing rider inputs.

A key area of this is the integration of advanced digital solutions, including artificial intelligence (A.I.), in order to optimize decision-making and identify the best configurations for varying track conditions.

RINA is also working closely with Aprilia Racing's engineers to develop customized test benches - specialized tools that replicate the stress conditions experienced during a race - for various structural components of the motorcycle. Through the use of computational fluid dynamics (CFD) models, which analyse and optimize the behaviour of liquids and gases, the collaboration is improving bike aerodynamics to minimize drag across the different racing configurations.

The partnership is also focused on the creation of ultra-lightweight materials, developed using RINA's expertise in this area, and in particular its knowledge of innovative manufacturing technologies such as additive manufacturing.

ACCIONA: conservation and wellbeing

ACCIONA's goal is to be an acknowledged leader in developing regenerative basic infrastructure assets which are designed to ensure people's well-being and the conservation of the planet.

Today we operate three technology and innovation centers focused on sustainable solutions in construction, water technologies, and renewable energy.

The three centres define their strategy and business priorities according to the company goal, in order to create a true impact in the different business areas and in the solutions we deliver to society.

ACCIONA has developed an extensive portfolio of innovative solutions that provide an end-to-end response to the challenges facing humanity, including solutions in energy, transport, water, cities etc.

The construction sector is facing several different challenges such as low productivity ratios, an aging skillforce, a high carbon footprint, and large resource consumption.

We are tackling these challenges by positioning our R&D projects across three main areas: Industrialization, Digitalization and Decarbonization.

As such, we are working on digitizing our construction projects, and capturing and analyzing the data our projects are generating, and using these data as a decision support tool.

With real-time processing of the data, we can mitigate risks, reduce schedule deviations and take measures for increased productivity.

We are also working to reduce the carbon footprint in our projects, by replacing traditional materials with low-carbon ones. Last but not least, we are working towards the automation of different construction processes, and the introduction of robotics or collaborative robots (cobots) to carry out different project activities.

Our construction business is international, with a large share of construction projects located out of Europe. Hence, we are always thinking globally, and how technologies can be replicated in the countries where we are present, all the time adapted to local regulation, standards or manpower.

Our R&D Centre counts some 60 engineers and more than 14 state-of-the-art labs, plus two workshops for large scale prototyping. To make sure our projects are relevant, we work around a multiannual research and technology plan, which is reviewed and updated yearly.

The main goal at the Construction Technology Centre in ACCIONA is to develop or integrate technologies that will contribute to create a significant impact in our construction projects.

All of our developments must bring some tangible benefit for our projects, being a reduction in cost, time savings, environmental or sustainability improvement and so on.

We have participated in many projects that are helping us move forward and achieve our strategic goals.

In the FISSAC project, coordinated by ACCIONA, we worked together in the creation industrial symbiosis across the construction value chain, and the generation of circular economy models in the construction sector.

In the Eco-binder project, led by RINA, we worked in low CO₂ binders for eco-innovative, durable and standardized envelope components. However, the results can be then extrapolated towards other construction elements.

In Marewind project, we have worked in durability and maintenance of materials in offshore structures to guard against failure, malfunctioning and loss of efficiency.

The know-how generated is not only valid for offshore structures located far from the coastal area, but also for maritime and infrastructure in port areas.

Currently, we are participating in LIAISON project, also with RINA, which aims to lower the transport environmental impact along the whole life cycle of the future transport infrastructure.

We have had a long-lasting and productive relationship with RINA for many years, and we look forward to continuing this fruitful cooperation in future.



BIO.



Interview with **Javier Bonilla**
Innovation and Digital Manager at
ACCIONA

Javier Bonilla is the Innovation and Digital Manager at ACCIONA, a global group dedicated to the development and management of infrastructure (construction, water, industrial and services), particularly in the field of renewable energy.

Javier leads ACCIONA's Digital team where he is responsible for the development and integration of digital tools and services in projects, the deployment of BIM strategy, and data integration in the company.

As Innovation Manager, Javier is also responsible for innovation partnerships and the creation of innovation networks, including participation in European R&D programs. He is a member of the European Construction Technology Platform (ECTP) Steering Committee and Presidium.

Javier has a M.Sc. in Civil Engineering and a B.Sc. in Economy and Finance. He has been with ACCIONA since 2004, starting as a researcher in the R&D Department in the field of Fibre Reinforced Polymers in construction, and subsequently as Project Manager in EU research projects.

Counting with a network of reliable partners which compliment your line of activity, and on which you can trust during the project life cycle, including the idea inception and proposal preparation, is essential for succeeding in an ever-increasing competitive environment.

Going forward, we are of course keeping a close eye on future European projects relating to sustainability and climate resilience.

We will prioritize our participation in those projects with closer time-to-market and higher potential for implementation in construction projects. We will follow closely trending emerging technologies and analyze which of those might have a more relevant in future in construction, and regarding our participation, we will try to concentrate our efforts in those projects that can help to create bigger impact in our projects.

Our strategy for participating in EU Funded projects is just like for our internal project portfolio: they are driven by the potential impact the project objective can generate into our business.

As such, an enhanced cooperation in areas like digitalization, including AI, or automation in construction will be very important into the coming years.

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learn more about
ACCIONA



Innovation in the “built environment”



The European Construction and sustainable Built Environment Technology Platform (ECTP) was founded in 2004 to promote and influence research and innovation in the construction industry and the wider built environment*.

The goal of the platform is to identify the technical, environmental and societal needs to be met, as well as improve the competitiveness of the European sector so that it could compete in the international market.

Europe's population of more than 450 million people spends more than 90% of their lives in buildings and other built structures, making it essential to put humans at the centre of proposals.

The platform today has 160 member organisations across 26 European countries, and counts a range of companies, from large enterprises to innovative SMEs, universities and research organisations, and professional organisations.

From 2010 onward the energy transformation and the path to decarbonisation have added an extra element to the platform's work.

Our aim is to ensure a high quality sustainable built environment for the largest number of citizens with the lowest environmental impact. This means creating a safe, resilient and user-centric built environment based on a socially responsible circular economy which also respects Europe's cultural heritage.

ECTP is used to create position papers, and subsequently Strategic Research & Innovation Agendas (SRIAs), which are discussed with the European Commission (EC). In this way, members can influence the future agenda of the EC.

The ECTP is currently running six committees: Built Environment Decarbonisation; Infrastructure and Mobility; Materials and Sustainability; Heritage and Regeneration; Built for Life; and Digital Built Environment. Each committee is developing strategic research and innovation, producing position papers on a regular basis.

A key element of our work is our relationship with the European Commission, which includes close discussion of issues relating to innovation in construction and the built environment. The most recent partnership between the EU and ECTP is the Built4People (B4P) Partnership which, under the Horizon Europe research funding programme (Cluster 5: climate, energy and mobility), aims to bring together the whole value chain to accelerate people-centric innovation for a sustainable built environment.

The ECTP has signed a seven-year memorandum of understanding under which the EU will provide €380M in funds, while ECTP members will contribute a similar amount of in-kind contributions. The accent is on full decarbonisation over the life cycle of the built environment, incorporating the circular economy.

The programme aligns with three major EU policies: the European Green Deal, the Renovation Wave (aimed at increasing the level of building renovation in Europe) and the New European Bauhaus (a policy and funding initiative launched by the EC in 2021 which aims to revive the radical approach of the original Bauhaus School).

The ECTP works with the EC on Europe's Research Framework Programmes. The EC is currently preparing its 10th edition where it should incorporate new ideas for innovating in the construction and built environment sphere.

ECTP is currently exploring innovation around two key concepts which may see adoption in FP10: Digital Transformation and Circular Transformation.

Both contribute to resource efficiency over the full life cycle, from inception to design, and from construction to renovation, demolition and waste management.

- Digital Transformation – two taskforces have been launched in ECTP to deliver white papers on the subject of construction data spaces, and Digital twins & AI. The construction and built environment industries now cumulate enormous amounts of data, but we need to know how better to collect, structure, store and use it. We are also looking into the increased digitalisation of operations, and how best to use AI and digital twins in the building process.
- Circular Transformation – Europe has a large



BIO.



Interview with **Alain Zarli**
Secretary General of the European
Construction Technology Platform

Alain Zarli is Secretary General of ECTP, the European Construction Technology Platform, and Managing Partner at R2M Solution. He was formerly Head of the “Innovation Numérique pour la Construction” division at the Centre Scientifique et Technique du Bâtiment (CSTB) in the “Technologies de l'Information et Diffusion du Savoir” department (Sophia-Antipolis, France), and European Affairs manager in CSTB. His main fields of interest are Information and Communication Technologies (including programming languages and compilation, semantic modelling, rule-based languages and knowledge-based systems, distributed architectures, software components, and technologies for smart constructions) and their broad application to the built environment and the construction industry, in particular BIM and Digital Twin technologies. He has been the Project Coordinator of various European collaborative FP5, FP6, FP7, Horizon 2020 and Horizon Europe projects. He has been active for many years in various ECTP initiatives, and is currently responsible for the Built4People Partnership under the Horizon Europe Framework Programme. Among other things, he also participates in the EC Advisory group for ICT Infrastructure carbon neutral cities, and the EIP SCC Operational Implementation Plan.

proportion of old buildings, with new buildings representing just between 0.6 and 0.8% of total stock. Only just above 1% of the buildings is being renovated to meet decarbonisation and energy goals each year. Thus, it would potentially require 100 years to complete this process, while we simultaneously have a much earlier decarbonisation deadline of 2050. So, it is clear this process of renovation needs to be accelerated. Furthermore, we need to ask what must be done with the old buildings to meet the decarbonisation goals. We need to explore the best options, whether it is to transform these buildings into more efficient constructions, or to demolish them with a far enhanced waste management. This also touches on Europe's cultural heritage, which is important to preserve.

As per the European Affordable Housing initiative, ECTP is active in identifying challenges, gaps and needs, closely working with Housing Europe, the European Federation of Public, Cooperative, and Social Housing, which represents an estimated 10% of housing in Europe.

Meanwhile, we are also working to encourage greater investment from the private sector, where construction arguably lags behind some other industrial sectors such as manufacturing.

* The Built Environment includes all the human-made surroundings that provide the setting for human activity. This ranges from buildings, to infrastructure, to networks (mobility, energy, communication, etc).

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ECTP



Linking AC to DC

Hybrid AC/DC and HVDC power systems have the potential to increase energy efficiency, and support the widespread integration of renewable energies.

The transformation of current AC power systems to hybrid AC/DC and with HVDC brings several challenges, however. Common power systems, and also the SCADA system, were originally designed for AC grids. Therefore, maintaining the stability of the power system is the most pressing technical and operational challenge.

Frequency, rotor, voltage, oscillation, and protection schemes must be updated properly to ensure the future reliability of the hybrid AC/DC power systems.

PSI is closely involved in the DAEDALOS project, a 48-month scheme divided in 7 Work Packages (WP)

that aims to develop a comprehensive framework and advanced software tools to support the planning, operation and monitoring of AC/DC hybrid systems and MVDC/HVDC grids on a state-of-the-art SCADA system.

The DAEDALOS project will contribute to the acceleration of the energy transition and the integration of intermittent renewable energy sources (RES).

The project comprises the partners from European grid operators, industry - such as PSI - and leading research institutes. This collaboration is well placed to achieve the evolution towards hybrid AC/DC power systems. It will also work on developing the software tools to cover the aspects of grid planning, operation, and monitoring for the hybrid AC/DC.

DAEDALOS is arguably unique in that it covers the complete aspects necessary for system stability from grid planning, operation and monitoring. It also includes the research based on mathematical methods and machine learning.

PSI will focus on the development of a decision support tool based on dynamic security assessment (DSA) for the hybrid AC/DC power systems, and is involved in the demonstration from the control system perspective.

This also involves ensuring that the PSI software tool development can deal with the practical issues encountered by the grid operators of the TSOs and DSOs.

In order to integrate the advanced software tools or real-time algorithms developed in the project into the SCADA system, PSI is now working towards the Control System of the Future (CSF), which considers several aspects in order to tackle future sustainable power systems. Scalability and modularity are key features of the CSF: the advanced software tools developed within the project will be integrated as modular tools to our SCADA system.

Crucially, the advanced software tools developed will have a chance to be tested in collaboration with the real SCADA software from PSI, and can be tested at the demo control center, which is designed to closely resemble the real control room used by the grid operators.

PSI is implementing a demo control center at a PSI location in Dortmund, Germany. This control center will be equipped like a real control room with the video wall and the future-proof operator workspaces, where operators can work conventionally or via virtual reality.

It will be connected to the external demonstrator sites and the external software tools developed within the project during the project demonstration. The demonstrations will be implemented by our project partners in Aachen and Barcelona.

Among the important outcomes, we expect to showcase the technology advancement from the project that can be used to tackle the challenges from the hybrid AC/DC power systems. PSI will aim to demonstrate the potential operations of the SCADA systems in the hybrid AC/DC power systems. This will be key for the distribution and transmission system grid operators.



Interview with **Thomas Böhmer**
Executive Vice President at
PSI Software

BIO.

After completing a degree in electrical engineering, Thomas started his career the Chair of Power Engineering at the University of Dortmund. He subsequently joined ABB in the field of network control technology.

Since 1997, Thomas has been working for the PSI Group in its "Electrical Energy" (EE) Business Unit.

His fields of activity are central software development, project management for medium-voltage/transmission grid operators and divisional project management.

From 2013 to 2023, Thomas was head of the "TSO&Rail" division, before becoming head of the Electrical Energy unit in October 2023. Since December 2024, he is responsible for the newly founded business unit "Grid & Energy Management (GEM)" as Executive Vice President at PSI Software.

RINA has provided a great deal of support to PSI within the DAEDALOS project and from various perspectives. This includes the preparation of the project proposal, project management and administrative work.

The partnership with RINA has strengthened the project execution, which in turn has enabled PSI to primarily focus on its objectives and the technological contributions to the project.

Meanwhile, in order to ensure the practical applicability of the DAEDALOS solutions in real-world grids, PSI will also work closely with the TSO and DSO partners within DAEDALOS to define use-cases and scenarios that are as close to the real-world challenges of the hybrid AC/DC as possible. In these cases, we will use the DSA-based decision support tool and the SCADA system perspectives.

Principally, we will focus on the reduction of inertia and frequency stability in the power systems, which are critical issues in the energy transition.

In addition, we are concentrating on using standardized technologies for the integration, in order to ensure practical implementation as a result of the project. A helpful orientation is the ENTSO-E roadmap, which also addresses several relevant issues for DAEDALOS.

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Cybersecurity for submarine structures

Submarine infrastructures are increasingly at the center of geopolitical, economic, and security interests.

The European submarine network is a vital Critical Infrastructure (CI). This underwater cable and pipeline network is crucial for the functioning of European society.

As threats become more hybrid and sophisticated, protecting these assets requires an approach that addresses both cyber and physical domains.

Key emerging threats include:

- Intentional damage or interference by nation-states, using submarines, unmanned underwater vehicles, and covert operations
- Cyber intrusions on their supporting digital systems e.g. landing stations, network controllers, SCADA platforms etc.
- Exploitation as insider threats of the personnel involved in the construction, maintenance, or operations; third-party components or services can also be exploited to insert cyber backdoors or compromise integrity
- The increasing use of AI, IoT, edge computing, which improves efficiency but also expands the attack surface. Automation can introduce systemic vulnerabilities across both cyber and physical layers, requiring a "security by design" approach.

To address these converging risks, a shift from reactive defense to resilience-by-design and integrated risk governance is essential.

The EU-backed VIGIMARE project takes a systematic approach to strengthening the European network of submarine telecommunication cables, power cables and gas pipelines. It stands out for its integrated, multi-domain focus.

Key innovations include:

- A converged physical-cyber risk framework: VIGIMARE goes beyond traditional physical surveillance or isolated cybersecurity tools by merging cyber and physical threat detection into a unified risk management model
- Real-time monitoring and situational awareness: the project leverages a network of tools to enable continuous monitoring of critical underwater assets. This provides early detection of anomalies, whether physical (e.g., suspicious underwater activity) or cyber (e.g. unusual access patterns in landing stations)
- A European-wide vision: unlike more localized or bilateral projects, VIGIMARE is designed as a scalable

and replicable model across EU member states, supporting the EU's broader maritime security and strategic autonomy goals. It is highly aligned with the strategic objectives and compliance requirements set out by the CER (Critical Entities Resilience) and NIS2 directives.

In short, it combines advanced technological capabilities, real-time intelligence sharing, and cross-sectoral coordination to address the growing hybrid threats to Europe's submarine infrastructures.

Terna, Italy's electricity transmission system operator, participates in the VIGIMARE project as the owner of the critical subsea infrastructure featured in the Mediterranean use case.

We are directly involved in several key activities:

- Risk and threat analysis related to the infrastructure, with a particular focus on hybrid scenarios involving both cyber and physical components
- Development of detection and monitoring capabilities, in collaboration with technology providers, aimed at enhancing situational awareness and early identification of anomalies in the submarine infrastructures domain
- Contribution to the definition of response and resilience strategies
- The sharing of operational insights and technical expertise, in compliance with security regulations, to support the development of interoperable protection models.

VIGIMARE's emphasis on interconnections and interdependencies among infrastructure networks is crucial to achieving the EU's dual objective of resilience and open strategic autonomy.

This systems-level approach acknowledges a fundamental reality: modern infrastructures are not isolated assets but deeply integrated nodes in a broader, interdependent ecosystem of digital, energy, military, and logistical domains.

As part of the VIGIMARE project, Terna is leading a strategically important pilot use case focused on its submarine interconnection infrastructures.

Terna's contribution focuses on multi-vector hybrid attacks that combine cyber and physical tactics targeting HVDC submarine infrastructure.

The models account for operational, safety, environmental, and defense-level consequences, and



BIO.



Interview with **Silvio Parente**
Cyber Resilience Strategy and OT
Security at Terna

Silvio Parente is a cybersecurity governance and risk management expert with significant experience in the protection of critical infrastructures. He currently works at Terna, Italy's electricity transmission system operator, where he leads key initiatives within the Cyber Security Program and Portfolio, supporting the implementation of strategic activities aimed at enhancing the cyber resilience of the national power grid.

His work focuses on risk-based prioritization, performance monitoring frameworks, and the strategic development of cybersecurity initiatives.

Previously, he held positions at Cassa di Risparmio di Padova e Rovigo, where he led ICT governance, risk assessment, and compliance projects in complex organizational environments.

Silvio holds a Master's degree with honors in Statistical Sciences and a second-level Master's in Homeland Security, with a specialization in critical infrastructure protection. He is a Certified Information Systems Auditor (CISA) and has deep expertise in cyber risk analysis, internal control systems, and regulatory frameworks.

include the simulation of coordinated threats such as SCADA manipulation, ICS-targeting malware, phishing, ransomware, and more.

These simulations go beyond traditional tabletop exercises, creating field-informed risk scenarios that push the boundaries of conventional critical infrastructure protection.

Terna is also providing Risk and Threat Modeling, Scenario-based Simulations, and Monitoring and Detection Strategies tailored to submarine assets, integrating cyber and physical risk indicators.

From the start, RINA has contributed significantly to promoting innovation and knowledge exchange within the VIGIMARE project.

Its involvement has helped create a collaborative environment where different expertise and perspectives come together, which in turn has supported the development of new approaches to managing cyber-physical risks.

This cooperation has supported steady progress and added value to the project overall.

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Exploiting SCC in steelmaking



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Secondary Carbon Carriers (SCC) (e.g. biomass, biochar, rubber, polymers) have been recognized as potential alternatives to fossil coal in ironmaking and steelmaking operations.

These materials can serve as substitutes for fossil fuels, acting as reducing or carburizing agents and also energy carriers in steel production.

The successful utilization of SCC has been demonstrated in several projects. Among these are the GreenEAF2 (RFSP-CT-2014-00003) and Onlyplastic (899415) projects.

Both projects, coordinated by RINA, showed the effective application of biochar and polymers in Electric Arc Furnace (EAF) steelmaking using long term industrial testing.

As with all new technologies, there are some challenges to overcome. A single SCC cannot fully substitute the carbon source in steel production due to oscillations in availability, technical challenges in processing and the degradation of properties over time.

Therefore, an effective and flexible use of SCC mixture is needed to industrially achieve the decarbonization of steel.

To fill the gap, a multi-material approach is necessary, which will target the replacement of fossils up to 100% in various process steps. Due to the different sources of SCC, the issue of traceability of origin is fundamental.

For this reason, the development of Digital Product Passports is a vital step and a prerequisite for their utilization in a steel factory.

Furthermore, due to the different characteristics of the materials, a digital platform, able to combine the characteristics of the material with its process requirements, is mandatory to ensure stable production operation.

This digital platform combines data showing not only the characteristics, but also availability, and deploys a plant digital twin in order to dynamically propose best operating practices.

This multi-material approach, and the development of tailored digital tools, is the focus of the ongoing CROSSCUT (GA 21044699) project, led by RINA. CROSSCUT targets the replacement of up to 100% of fossil fuels in various process steps, and different steel and FeCr production chains i.e. EAF, BF and SAF. It also offers a traceability solution, long term industrial trials and a digital platform for optimal material management and flexible utilization with various SCCs.

The European steel industry needs an estimated 15 million tonnes per year SCC for ironmaking and steelmaking, (including both Electric Arc Furnace (EAF) and Blast Furnace (BF) based processes).

On a conservative basis, we can assume the following amounts of SCCs: for Blast Furnace plants 60-110 kg/t of hot metal, and for Electric Arc Furnace 12 kg/t of steel.

CO2 savings are estimated at about 30 million tonnes per year.

RINA is carrying out detailed Life Cycle Assessment (LCA) analyses for all the projects.

SCC utilization also brings waste advantages. By re-using secondary raw materials, we can avoid an estimated 15 million tonnes per year of landfill waste.



RINA opens AI Factory



By **Francesco Buonsanti**
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Achieving innovation at scale is one of the main long-term goals of RINA. To attain this objective, RINA has established its AI Factory: an innovation lab composed of cross-business teams of professionals whose aim is digital transformation through both the optimization of services and processes, and the creation of new digital solutions using artificial intelligence.

RINA's AI Factory is not just a technological development center but a true innovation lab: here, new technologies and digital solutions are explored, tested, and validated through pilot projects that demonstrate their feasibility and added value for the market. RINA's AI Factory is working in parallel at two different levels.

We are:

- Developing new digital-enabled services to meet customers' needs, and/or leveraging AI technologies to develop services with features that were previously not feasible
- Upgrading RINA's existing digital-enabled services to embed the very latest developments in digital and AI technology in order to be more effective, user friendly, and interconnected with the rest of RINA's service portfolio.

The AI Factory is designed as an integrated structure able to follow the entire digital life cycle of a product - from the features definition, to the customer support throughout the software development, and the first product commercialization. This allows speed in the decision-making process, fast execution and quick deployment on the market.

New technologies and digital solutions are explored,

tested, and validated through pilot projects that demonstrate their feasibility and added value for the market.

RINA's AI Factory is composed of two main bodies working in collaboration: the business/business model experts, and the software architects/specialists. This enables the factory to not just identify AI technologies but also their potential application, and therefore how to translate a market need to a smart digital solution in the most effective way.

RINA has ambitious growth plans for the AI Factory. We are working to ramp up its operations, applying internal and external resources, C-level involvement and significant funds.

This commitment has attracted high level talent from the market, from those seeking to work in an international environment.

The AI Factory represents an accelerator in RINA's digital transformation and a strategic resource for building cutting-edge services, streamlining internal processes, and offering increasingly customized and innovative solutions to the market.

With this structure, RINA positions itself among the leading operators of the digital revolution, providing skills and technologies that meet future challenges and support clients in their growth and evolution.

RINA's AI Factory allows us to consolidate our role as a trusted technological partner, capable of offering digital services in line with the new sustainability, efficiency, and competitiveness requirements.

WTP: securing sustainable water transport



By **Alessandro Maccari**
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Waterborne transport - encompassing shipping, inland navigation, and maritime services - has long been the backbone of global trade and economic development. As the world faces an urgent need to address climate change and the digital revolution, the Waterborne Technology Platform (WTP) stands at the forefront of redefining the sector's future.

WTP is a collaborative initiative, established as an industry-driven platform, engaging EU stakeholders to identify Research & Innovation (R&I) priorities. WTP brings together shipbuilders, shipowners, ports, equipment suppliers, classification societies, research institutes, and public authorities.

The origins of the WTP can be traced back to the early 2000s, when the EU recognized the crucial role of waterborne transport in achieving sustainable mobility. The increasing demand for greener logistic chains, stricter environmental regulations, and the need to maintain EU leadership in maritime technology prompted the formal establishment of WTP.

Over time, the platform has become a central forum for setting strategic R&I agendas, fostering cross-sectoral collaboration, and aligning industry interests with public policy. Today, it plays a pivotal role not only in Europe but also in influencing global approaches to waterborne innovation.

As a member of WTP, RINA shares the same vision: to facilitate the transition toward zero emissions, and a digitalized, highly efficient waterborne transport industry, through:

- Competitiveness, by supporting technological innovation, upskilling the workforce, and promoting investment in R&I
- Safety and Security, by implementing advanced technologies, cybersecurity, and resilience against emerging threats
- Environmental Stewardship, by promoting protection of marine environments by developing emission-reducing technologies and tools to monitor pollution.

WTP strategic research and innovation agenda covers a wide range of technological domains, clustered in key areas: Alternative Fuels & Propulsion Systems, Smart & Autonomous Vessels, Energy Efficiency, Digitalization & Data Integration, Green Ports & Logistics, Safety & Environmental Monitoring.

WTP's strength lies in its commitment to collaboration and inclusivity. The platform acts as an umbrella organization, facilitating dialogue between industry, academia, and EU policymakers to ensure that technological advances are practical, scalable, and beneficial for all stakeholders.

The most visible form of collaboration is the establishment of Public-Private partnerships for joint R&I projects and pilot initiatives, such as the Zero Emission Waterborne Transport (ZEWT). But much more is done in terms of workshops, conferences, and working groups to share best practices.

These in turn foster innovation, support regulatory alignment, pave the way for the adoption of new technologies, cooperate with similar organizations worldwide, promote global standards and exchange knowledge.

Looking to the future, RINA and WTP will accelerate progress toward a climate-neutral, resource-efficient, and interconnected waterborne transport system, continuing to advocate for supportive policies and investments that align public and private interests toward sustainable innovation.



NEB to inspire future projects

"If the European Green Deal has a soul, then it is the New European Bauhaus which has led to an explosion of creativity across our Union"

Ursula Von der Leyen,
President of the European Commission

The New European Bauhaus (NEB) scheme is a policy and funding initiative launched by the European Commission in 2021 which aims to revive the radical approach of the original Bauhaus school legacy. The scheme concerns buildings, open spaces, neighborhoods but above all, it is centered on people.

The New European Bauhaus movement is rooted in the broader framework of the European Green Deal and embraces its ambition under three core values: beautiful, sustainable and together. These values are enhanced by specific working principles: the participatory process, multi-level engagement, and the transdisciplinary approach. In 2021, European Union institutions issued a call for proposals to support the deployment of lighthouse demonstrators for the New European Bauhaus initiative in the context of Horizon Europe missions. The Eyes Hearts Hands Urban Revolution (EHHUR) project was selected as one of the five shortlisted demonstrator projects to be financed, facilitating the way forward for other New European Bauhaus actions.

EHHUR is a pioneering project and stands as a flagship initiative which will serve as a source of inspiration for future EU projects, as it develops and tests a new integrated co-designed methodology to support cities in their green transition. Seven Lighthouses across Europe (DK, EL, BE, PT, TR, HR, IT) will serve as demonstrator cases. The methodology is based on three different phases:

- Planning: context analysis, renovation plan and financing schemes
- Execution: envisioned solutions implementation and monitoring
- Replication: broader dissemination, replicability and upscaling of project's results.

The methodology covers pioneering community engagement practices, innovative financing schemes, as well as groundbreaking digital and green technologies application. Designed for scalability and long-term impact, this approach will empower the Lighthouses to sustain and expand their ongoing projects, even beyond EHHUR's completion.

RINA is acting as the Project Coordinator within EHHUR. It is the intermediary between the consortium partners and the European Commission, while also ensuring effective project implementation.

RINA is also supporting project methodology and tool



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development. Indeed, one of the most concrete and impactful results of EHHUR is the Decision Support System (DSS) tool. This is a web-based application for the decision-making process and enables European cities to plan the best strategy to reach their decarbonization and energy transition goals, fulfilling key New European Bauhaus values. The results are based on the experiences of the 7 EHHUR Lighthouses.

The DSS interface offers intuitive support to identify the most effective solutions to be implemented in a specific local context. It emphasizes innovative engagement strategies, as well as the key enablers. EHHUR places citizens at the heart of the urban revolution, promoting a people-centric approach where individuals drive urban transformation. This is key as change cannot happen without awareness: empowering people will be the foundation for tackling the major challenges facing our world today.

AEROSUB: robotics for offshore wind



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Funded by Horizon Europe, AEROSUB is an innovative project developing cutting-edge robotic solutions to enhance operations and maintenance (O&M) in the offshore wind industry.

The project seeks to boost the safety, efficiency and sustainability of technology in the sector, and therefore the overall competitiveness of the industry.

AEROSUB brings together a wide range of stakeholders, including companies specializing in robotics and AI and global O&M service providers.

AEROSUB aims to demonstrate how unmanned robotic systems - including aerial, surface, and underwater robots - can lead to more cost-effective and safer offshore O&M activities.

Thanks to the integration of artificial intelligence, these robots can work autonomously or semi-autonomously, adapting to complex tasks, identifying potential risks, and optimizing inspection and maintenance schedules without the need for on-site personnel. This approach helps reduce both costs and resources associated with O&M activities on offshore wind farms, while also improving safety and effectiveness.

To further enhance the deployment of unmanned AI-powered robotics in offshore wind applications, AEROSUB also foresees the development of digital twin and remote monitoring systems, enabling real-time remote monitoring of offshore wind assets.

Combined with AI models, these systems enable predictive maintenance by preventively detecting anomalies or damage to offshore wind assets and suggesting preventive maintenance operations before equipment failure, reducing operational costs by up to 40%.

Unmanned robotic solutions reduce the need for human presence in hazardous offshore environments, potentially raising safety standards and contributing to a zero-fatality target for offshore maintenance operations by 2030. By optimizing offshore O&M procedures, AEROSUB also aims to achieve lower emissions, cutting the overall carbon footprint of offshore wind energy production.

RINA is leading strategic activities within the AEROSUB project. This includes improving AI-driven data detection through image analysis of aerial, surface, and underwater imagery collected during inspections carried out by unmanned aerial and underwater robotics. This AI-driven data detection enables targeted and more effective O&M interventions.

It is also responsible for mapping the regulatory landscape and identifying legal challenges that could affect the deployment and scale-up of AEROSUB solutions. RINA is also quantitatively assessing carbon emissions through detailed lifetime cycle assessment (LCA) analysis.

With its participation as a key partner in the project, RINA is confirming its commitment to supporting the offshore wind sector, and accelerating the energy transition with smarter, safer and greener solutions.



Digital tools to cut construction overruns



By **Clemente Fuggini**
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Construction projects are inherently complex, and managing such projects involves navigating a myriad of risks. Approximately 60% of construction projects face budget overruns and delays, highlighting the challenges involved in successful project completion.

Furthermore, more than 80% of delays and cost overruns in construction projects are linked to issues of poor coordination, risk underestimation, and poor process visibility.

Among the various phases of a project, activity at the construction site is one of the most risky and impactful. Not only are logistics and performance issues extremely challenging, construction sites are inherently dangerous, with a range of hazards that can cause serious problems. Understanding these risks can help construction managers create safer worksites, and better protect their teams from risk and environmental challenges.

Digitalization and innovation can support the optimal management of the worksite, both in improving worker safety and reducing the risk of incident, and in the tracking of tasks and activities. The latter can help minimize work interruptions and delays by monitoring the working environment, saving time over the life of the project and workers' well-being during construction activities.

At the forefront of these developments, RINA has developed a unique software platform that seamlessly integrates advanced IoT technologies with our expertise in Health, Safety and Worksite management.

Known as the RINA Digital Construction Worksite tool, it delivers real-time monitoring and decision-support across multiple workstreams to enhance safety, efficiency, and compliance of worksite activities.

Equipped with sensors, cameras, monitoring units, RFID codes, and other innovative features, the tool

facilitates the real-time collection and transmission of environmental, material, and equipment data to a centralized platform, and makes use of AI algorithms and machine learning techniques to compare monitoring results.

The platform has been successfully deployed in several pilot schemes across Europe, including in Trento, Italy, and Zaragoza and La Garriga in Spain.

Multiple different functionalities have been tested, including monitoring worksite environmental conditions like heat and air quality, triggering automatic alerts in case of heatwaves periods, and providing anti-collision solutions during crane-human interaction, with sensors sending alerts if a worker comes too close while the crane is operating, and warning the crane operator in time to react and avoid a potential accident.

Going forward, BIM-based (Building Information Modeling) functionalities will be enabled, starting with the use of Scan-to-BIM solutions, which aims to deploy a digital twin of the construction site so the user can simulate work zones, access points, and phases of interventions before launching on-site.

The platform enables site teams to stay safer, manage risk better, and keep things running smoothly, all while delivering the right data at the right time.

Rome adopts AI for real estate



By **Claudia Vari**
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The adoption of AI in the real estate industry remains small and fragmented, preventing quicker decision-making, and limiting the value of portfolios.

One city pushing to change this trend is Rome.



Roma Capitale owns one of the world's most complex public portfolios, made up of over 10,000 buildings, roads, parks, and cultural sites. Many of these assets are still tracked using multiple disconnected databases or even paper ledgers, creating inefficiencies, information gaps, and missed economic and social opportunities.

Roma Capitale's public property stock includes more than 65,000 buildings and 15,000 roads and public spaces. Yet an estimated 30% of this data was mismatched due to incomplete digitisation, fragmented cataloguing, and legacy systems.

The cost of this misalignment is significant: over €1.2 billion in unrealised asset value; roughly €50 million annually in uncapped maintenance work; significant delays in public housing requests; and lost opportunities to leverage assets for credit or reinvestment.

The city needed to centralise and modernise its property data, improve transparency, and enable faster, data-driven decisions, while keeping citizens' needs at the forefront.

In partnership with Ideare S.p.A., a part of RINA Prime, Roma Capitale launched the Atlas Project, built on the REFTREE platform, providing a solution that manages over two million assets across Italy.

The project brings together AI, advanced data modelling (HBIM), and automation to digitise thousands of records and build a dynamic inventory of the city's assets.

Atlas also integrates with Rome's accounting and cadastral systems, while also leveraging cloud technologies for scalability and security.

AI has the potential to:

- Optimise high-impact activities such as portfolio analysis, document management, and due diligence
- Strengthen alignment between ESG strategy, asset management, and investment planning
- Reduce decision-making time by automating CAPEX scenarios, regulatory validations, and reporting.

Through the city's Geoportal, citizens can now explore public properties, searching by district, address, or category using intuitive maps and individual property sheets.

A new My ERP app (the application that makes it easier to access key services) will allow tenants to manage payments and maintenance requests digitally, further improving services for residents.

So far, some €1.2 billion in hidden value has been identified, with opportunities to unlock further gains. In early results, internal reviews are being processed as much as 70–80% faster. More importantly, the project is enabling greater transparency and public trust, improved housing services, better planning for energy efficiency and sustainability, and enhanced opportunities to invest in social initiatives and public services.

With its scalable approach, the Atlas Project offers a powerful example for real estate management elsewhere in Italy, and beyond.

GO Flight, a gateway to microgravity



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Parabolic flights are aerial maneuvers performed by specially equipped aircraft to simulate microgravity. These flights follow a parabolic trajectory: the aircraft ascends rapidly, reduces thrust to enter a free-fall phase, and creates a brief period of microgravity. This method is essential for space research and astronaut training, allowing scientists to conduct experiments, and enabling astronauts to experience weightlessness.

During the free-fall phase, parabolic flights allow scientists to study phenomena altered by Earth's gravitational force. They are used for human physiology studies, particularly the effects of microgravity on astronaut health, space medicine, and plant growth in space. These flights also enable experiments in plasma physics, chemistry without gravity, and studying gases and aerosols in microgravity.

QBT Sagl, a subsidiary of RINA Prime Value Services, offers parabolic flights using general aviation aircraft like the Cessna 182, Cessna 172, and Piper PA28. Each flight includes four parabolas, totaling eight parabolas daily. These flights can achieve reduced gravity (below 0.5g), microgravity (below 0.15g), lunar gravity (0.16g), and Martian gravity (0.38g), allowing for the simulation of environments for long-duration space missions.

A key feature of QBT's flights is the ability to conduct experiments in a controlled environment. Experiments are housed in a dedicated rack developed with Politecnico di Milano, offering 1.4 m³ of space. Advanced telemetry developed with SUPSI in Lugano enables real-time monitoring and adjustments, even from a remote control station.

QBT prioritizes safety, ensuring compliance with international regulations. All passengers require a medical certificate confirming their physical fitness to endure microgravity. The company provides comprehensive support throughout the mission, including mission planning, operational details, and detailed technical documentation post-mission.

QBT has conducted many missions with renowned institutions such as EPFL in Lausanne, the University of Rome Tor Vergata, and ISAE-Supaero in Toulouse, contributing to studies in space medicine, plasma physics, chemistry in microgravity, and space robotics.

The Asclepios project, a research initiative simulating space conditions, uses analog astronauts in confined environments to study psychological and physiological effects. QBT collaborates with Asclepios, offering parabolic flights at Og for astronaut training. These flights familiarize astronauts with weightlessness and simulate space activities like experiments and spacecraft maintenance.

QBT's parabolic flights offer a significant cost reduction compared to international alternatives. The proximity to Valbrembo airport and mobile control stations eliminate the need for international transport, lowering both time and costs. The simplified logistics and flexibility make QBT's flights an ideal, cost-effective solution for simulating microgravity conditions for research. With its technological innovation QBT has established parabolic flights as a crucial resource for research, exploring the frontiers of science in microgravity.





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