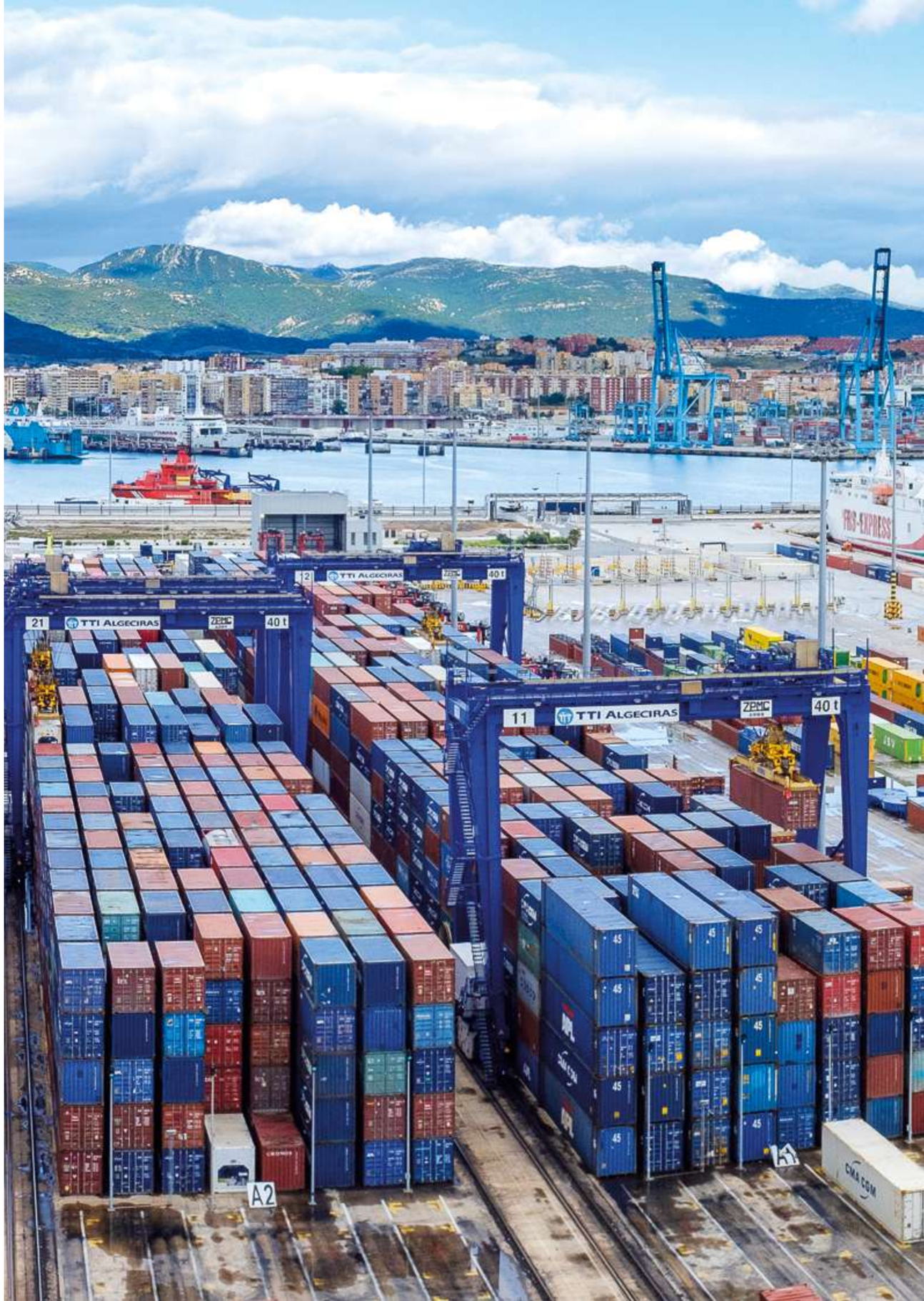
Innovation Report
2020

The reality
of a new
port.

Travesía
de la
innovación


TTI ALGECIRAS
ZPMC
40 t
21
11
A2
CMA CGM

DESIGN AND LAYOUT
Apolo©. Propulsora de marcas

PHOTOGRAPHY
Carlos Duclos©
Javier Galo Monge©
Pexels©
Unplash©
APBA©
TTIA©
Vodafone©

ACKNOWLEDGMENTS
Gerardo Landaluce
José Luis Hormaechea
Adriaan Landman
Dita Bruijn
Francisco J. Fernández

And all those who make innovation possible in the Port of Algeciras, thank you very much!

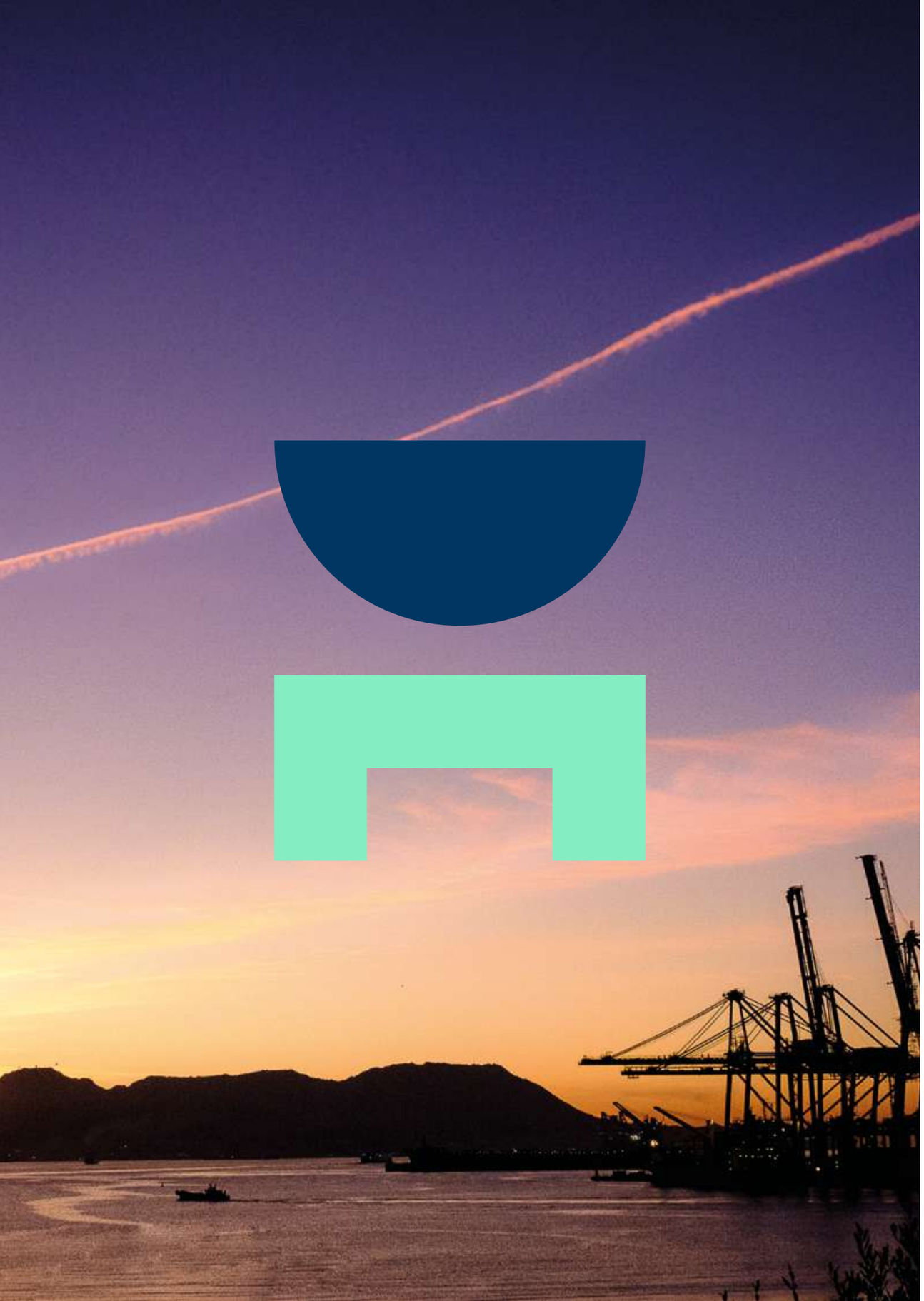
Index

Welcome to our Innovation Report 2020

A summary of the main actions and achievements in innovation-related matters by Algeciras Port Authority (APBA), including their Innovation Ecosystem throughout 2020.

> ***"Sow a thought and you will reap an idea. Sow an idea and you will reap an action. Sow an action and you will reap a habit. Sow a habit and you will reap a destiny."*** **The Kybalion.**

Travesía de la innovación × Algeciras Port



01.

Foreword by the Chairman and Director

2020 has been a challenging year, marked by the Covid-19 pandemic. Despite this, the Port of Algeciras has remained fully operative and has ensured an effective cargo flow and, thus, the supply of main products in our markets. A fact that draws attention about the importance of the shipping industry, is that 80% of global trade is transported by sea. Hence, such means of transport represent the foundation on which international trade is based.

At present, logistic trends are heavily influenced by globalisation, Just-in-Time operating models and e-commerce platforms. Our final customers increasingly demand a higher-quality services from us that entail end-2-end visibility of the supply chain, shorter and more reliable transit times, as well as greener and more resilient logistic chains. The latter is being specially demanded due to the current pandemic crisis. In such a complex situation, the Port of Algeciras continues to innovate with the conviction that questioning the "status-quo" is the best way to improve it on an ongoing basis and to achieve our vision, continue being competitive in the long term, and generate wealth for our region and customers.

Our **Innovation Strategy** is focused on highlighting the role of the Port Authority as a trade enabler, by acting as an operational orchestrator for the whole port and helping all port agents better carry out and coordinate their tasks. We believe in an **Open Innovation** model, which is embedded in the business, and the key to realise our concept of a Next Generation Port: a smart, decision-making port on the basis of data; a Just-in-Time, operationally excellent port; and a green port that contri-butes to the decarbonisation of the logistic industry.

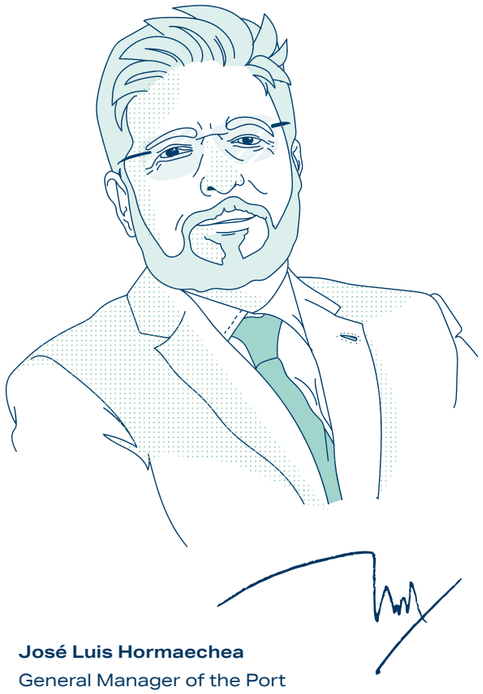
This report describes the main innovation-related initiatives conducted throughout 2020. Despite the pandemic, work has been hectic and innovation has seamlessly remained a key player. As a result, the Port of Algeciras has obtained the prestigious award ›

“In spite of these challenging times, the Port of Algeciras has continued working in order to become a reference in innovation”.

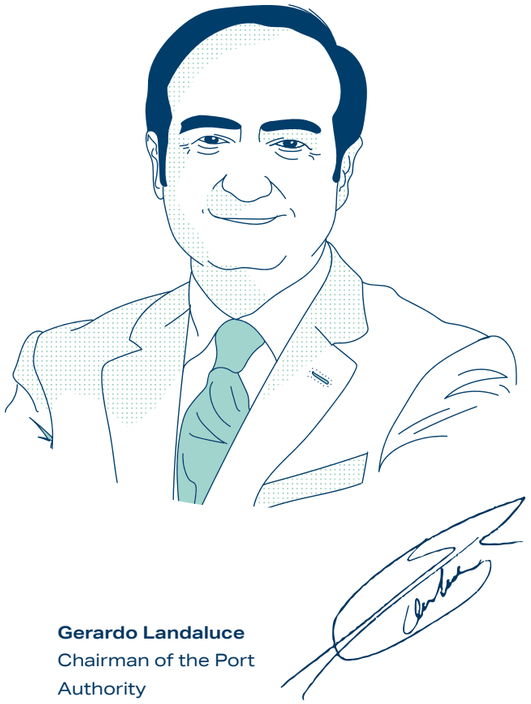
granted by the European Sea Ports Organisation **(ESPO Award 2020)** for social integration of ports by promoting innovation and collaboration with start-ups. This award acknowledges our work in recent years in the field of innovation and, more importantly, encourages us to continue working keenly and lively.

Another example of the Port of Algeciras' commitment to innovation as a leverage for competitiveness is the exciting project known as **"Lago Marítimo" (Maritime Lake).** This project involves a complete urban redevelopment with the aim of connecting the Port and the City of Algeciras, the environmental improvement of the area, and the creation of an innovative and all-inclusive set of buildings. In the course of 2020, the project has been fully defined and a call for tenders has been carried out so that it can become a reality in the short term.

Last but not least, we would like to thank all the employees at APBA, the companies within the Port Community of Algeciras, and our customers and partners, for making our Innovation Journey possible and for helping it move forward and progress. We have very exciting initiatives at hand so that the Port Community of Algeciras establishes itself as one of the world's leading **Innovation Hub!** ■



José Luis Hormaechea
General Manager of the Port Authority



Gerardo Landaluce
Chairman of the Port Authority

02.

Our innovation process and outcomes

// APBA renews its UNE 166002 Certification, referring to its Innovation Management System.

The Algeciras Port Authority (APBA) has renewed its RD&i management system certification. It was first obtained back in December 2019 and it officially proves that APBA continues to meet the requirements from the UNE 166002:2014 standard regarding research, development and innovation (RD&i) within the scope of logistic and port operations.

The UNE 166002:2014 Certification, granted by the Spanish Standardisation and Certification Association **(AENOR),** helping to regulate aims to organise, systematise and consistently improve RD&i activities, and ensure their maximum effectiveness and efficiency. This renewal reinforces APBA's commitment with RD&i, as well as the quality standards reached over the last years when it comes to coordinating and systematising the innovation processes. Through these processes we endeavour to achieve excellence and hence to strengthen the sense of satisfaction in our customers and users. In addition, this renewed certification acknowledges that we continue to commit to an **experienced, competitive and high-quality** RD&i **Mana-gement System**, whose effectiveness is unbiased, that guarantees good practices, and that promotes an ongoing improvement and high-quality innovation-related actions and projects.

RD&i Management System is not only helping APBA to regulate and systematise the key processes, from the inception to the implementation of projects and cross-cutting initiatives, but is also **enabling** new procedures in order to improve aspects, e.g. prospective technology, knowledge management, open innovation and development of tools to support innovation and, as a result, growth and evolution. Ensuring strategic compliance and the guidelines ›

that our conception of a **Next Generation Port** entails, is a consistent aspect of the above-mentioned. In other words, a **Just-in-Time, Smart and Sustainable Port.**

Finally, we would like to highlight the collaborative work of our Innovation Office coordinated by **IDOM**, which has accompanied the APBA in the tasks of management and maintenance of the RD&i Management System during 2020.

// The Port of Algeciras wins the 12th edition of the ESPO Award 2020 for its culture and innovation management program.

The Port of Algeciras became winner of the **12th edition of the ESPO Award 2020**. The European Transport Commissioner, Adina Valean, revealed the jury's verdict during a virtual ceremony held by **ESPO**. With this award, the European institution acknowledges the role of APBA concerning the **promotion of integration of innovative companies and local entrepreneurs in the port industry.**

Adina Valean emphasized the importance of the ports of the European Union in keeping a balanced logistic chain during the hardest months of the Covid-19 pandemic. The Commissioner also urged ports to continue working in order to achieve sustainable development. This prize acknowledges the role of European ports as driving forces for innovation and social integration. Specifically, this year's edition sought ***"to encourage local entrepreneurs and companies to take part in the port ecosystem with the goal to boost relations between ports and their environment."***

As the winner of this award, APBA introduced their **"Innovation Journey",** that is, their culture and innovation management program. Through this programme, the port institution runs multiple activities for university students, port employees, entrepreneurs, start-ups and technology SMEs. It realises contests and prizes for innovating ideas, and it provides companies with port facilities to test their proposed solutions, within the framework of the initiative *"Algeciras Port Living Lab"*. The Chairman of APBA, Gerardo Landaluce, thanked ESPO, the representatives of the other ports participating and, specially, APBA's Technological Development Department and the Technical Innovation Office managed by **IDOM**. He thanked them for their good work over the last few years to reinforce the innovation culture in the Port of Algeciras.

The project "Ports 4.0" by Puertos del Estado (Spanish body within the Ministry of Transport), and the proposals presented by the ports of Amsterdam and Lisbon were **selected finalists** by the jury in this 12th edition of the ESPO Award 2020 for the Social Integration of the Ports. The ports of Oulu (Finland), Thessaloniki (Greece) and Rotterdam (Netherlands) participated as well, among others.

"This award proves we are on the right track and inspires us to work more and more in order to promote social integration through innovation." Gerardo Landaluce, **Chairman** of APBA.

// This is how the future "Lago Marítimo" of Algeciras will be, which will integrate the Port and the City and will house the Port Innovation Centre.

In February, Marifrán Carazo (Spanish Minister of Public Works), José Ignacio Landaluce (Mayor of Algeciras), and Gerardo Landaluce (Chairman of APBA) signed a protocol in Algeciras for the development of the project **"Lago Marítimo".** This port-city integration project would finally realise a long-awaited action plan that responds to a historical demand to recover the public use of these spaces. For this reason, the regional Council of Andalucía, the local Council of Algeciras and the Port Authority have taken up the project to transform and value the port-city spaces, and their connection from the North Access bridge to the port and far end of Llano Amarillo, covering the seaside stretch of Paseo de la Cornisa and Playa de Los Ladrillos/Paseo de Juan Pérez Arriete. These areas would turn into a Maritime Lake for people in Algeciras to use and enjoy.

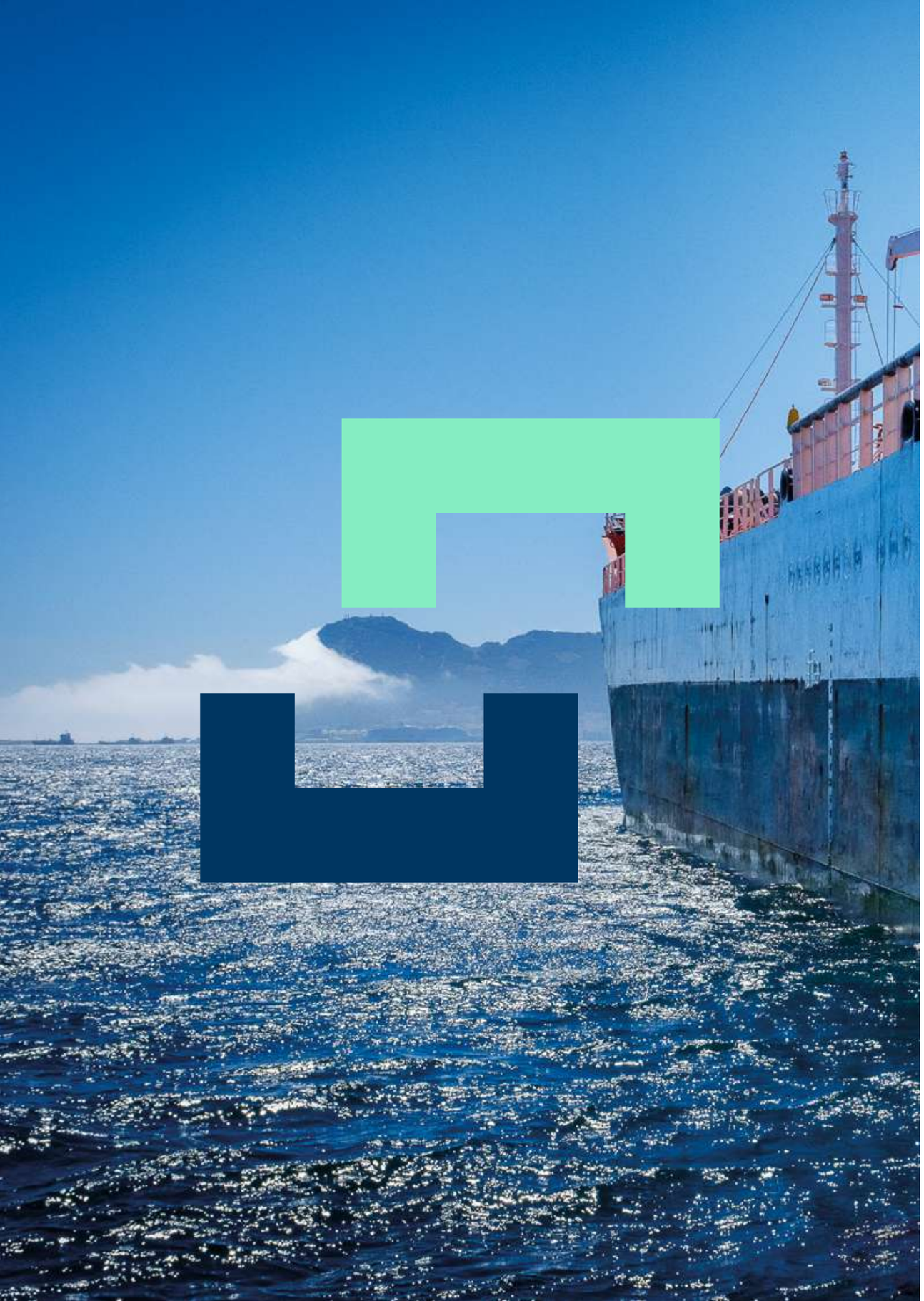
Thus, they intend to provide the last third of Llano Amarillo, excluded from OPE (Strait of Gibraltar Crossing Operation), with a set of multi-functioning buildings to meet the future needs of the port and the city of Algeciras.

The first stage involves the construction of 3 buildings at the north-eastern end. These buildings are intended for uses such as the Port Innovation Centre, a museum and interpreting centre, an auditorium for 300 people, as well as a building for the University of Cádiz (UCA) to hold activities related to the European University of the Seas. As for this latter aspect, this new space will also represent a knowledge space where training, cooperation, innovation and development of cutting-edge initiatives within the UCA campus, come ›

together in Algeciras, at the forefront in Andalucía. The second stage entails the development of a maritime lake in the area of Playa de Los Ladrillos, whose creation is currently being studied. Finally, a walking area will be built to allow pedestrians to stroll closer to the sea, as well as a wooden walkway between Playa de Los Ladrillos and Playa de la Concha.

The Chairman of APBA, Gerardo Landaluce, pointed out that **"our cutting-edge Port of Algeciras must harmonise its business and economic leadership with a special sensitivity to its environment, promoting sustainable development".** He added that **"The Lago Marítimo project represents a transformation, integration and enhancement of the coastline for the quintessential port city of Algeciras".**

The mayor of Algeciras, José Ignacio Landaluce, wished to raise awareness of the importance of this project that "will mean a giant leap for the city, providing it with new spaces for leisure, sports, training and research." In addition, he stated that "many meetings and professional events have been needed to reach this stage. Thanks to it, the regional and local councils and the port, in collaboration with UCA, are working like fine-tuned machinery on the common goal that people in Algeciras enjoy these facilities as soon as possible ". ■



03.

Listening to innovation experts

Adriaan Landman

Co-Fundador & COO de AllRead MLT.

Adriaan Landman is Chief Operating Officer (COO) and co-founder of AllRead Machine Learning Technologies (AllRead MLT). At an academic level, he has a Master's Degree in Corporate Communication and an MBA from Vlerick Business School (Belgium). His broad experience in operations and business development has allowed him to undertake managerial roles at leading companies in the information and publicity industries, located both in Belgium and France. As a digital technology lover, in 2008 he joined The Collider, a Technology Transfer Programme within Mobile World Capital Barcelona. There, together with other entrepreneurs, he launched AllRead MLT, where he's currently the sales and operations manager.

// Artificial Intelligence and corporate collaboration.

[Q] First we would like you to tell us a bit more about your start-up. How and when did AllRead come about?

[A] For about 5 years, 3 researchers from the Computer Vision Centre in Catalonia developed an artificial neural network with unique characteristics. It was able to find and extract, without segmenting or targeting, the value text in images. Applied initially to extract readings of gas metres, technology also showed higher levels of certainty than the state-of-the-art discipline and in several data sets such as vehicle registration numbers. Convinced of the scalability of this technology, these researchers introduced themselves to the Deep Tech Venture Builder "The Collider" (Mobile World Capital Barcelona), specialised in bringing disruptive technologies to the market. Once there 2 more experienced entrepreneurs joined them, and the team was complete - CEO and COO roles for AllRead Machine Learning Technologies (AllRead MLT) were all set.

[Q] You have specialised in probably the most disruptive emerging technology, bound to become a revolution for our society in every possible sense - Artificial Intelligence. What type of solutions do you create with this technology?

[A] ***AllRead MLT technology consists of a computer vision software for the extraction of texts, codes and symbols in images, based on Deep Learning.***

Neural network architecture is trained so that it can ›

directly perform reading tasks with no explicit step to locate content. It learns to differentiate between relevant and irrelevant text in each scenario. Initially we decided to apply the solution to operating environments for the monitoring and traceability of assets such as vehicles, containers, products, metres, etc. The software automatically processes images taken by a mobile or fixed camera, performs a digital extraction of useful data, and then integrates it into the corresponding management system. This means it detects, reads, and digitises serial numbers, sensor readings, bar-codes, registration numbers, and many other structured codes in complex operating environments. ***It is able to find text anywhere and at any angle, getting through any blur, stain and movement, in order to achieve maximum precision with a fast learning curve .***

[Q] **What sets you apart from your competitors? Which advantages do customers who choose to collaborate with you and implement your solutions get? Could you give us a specific example?**
[A] The competitive advantage of AllRead MLT is that it combines the highest precision in the extraction of data in complex environments with great agility for its implementation, adapting to the processes and infrastructures it is applied to. In other words, ***the resilience of our reading solution does not rely on hardware, as it has been traditionally done, but on software based on neural networks.*** As a result, our customers not only can easily install our software in any location, but also obtain a better return on their investment, in comparison with the existing solutions on the market. For example, in ports, container and vehicle traceability solutions often require fixed, expensive infrastructures with improvable levels of accuracy (several cameras, camera activation sensors, etc.) Instead, using a single camera, our system is able to extract relevant content from multiple sources (ISO container number, car and trailer registration numbers, vehicle type, etc.) This makes it possible to increase traceability in a flexible way.

[Q] **Do you think that companies really know all the advantages and opportunities they can get by using Artificial Intelligence? What is your role in that sense?** [A] 30 years ago, we wondered what the impact of the Internet was going to be. Now, it is ubiquitous, it is normal. In the same way, we believe that the use of AI is going to be democratised. It already exists in many aspects of our day-to-day lives without us realising it. This is why, in my opinion, many companies still do not know about the advantages and opportunities that AI brings - they have not detected how to apply it to their specific professional scenarios. If they are not interested in AI now, they will eventually be so, either through their specialised providers or their competitors.

Our function as a company using AI is to come up with solutions that work and add value. ***Relying on AI is one thing, but what really matters are the end results and the improvement brought to their businesses.***

[Q] **As for collaborations between start-ups and companies, Corporate Venturing is one of the multiple ways through which a start-up can work with a large company. Why is this type of collaboration considered very interesting for both parties? What does each party gain? What is your experience in this matter?**
[A] At AllRead MLT we have quite a lot of experience in Corporate Venturing. Our main investor is a corporate fund (Global Omnium, through its Corporate Venturing vehicle "GoHub Ventures"). We have also developed several projects through open innovation initiatives by large corporations, such as Correos, IAG Cargo, Comsa and APBA.

Corporations, aware of the need to innovate and of its own limitations to do it internally, open their doors for start-ups. The latter bring their drive to innovate while looking for chances and resources to develop, validate and prove their solutions. In this sense we reckon it is a win-win relationship.

[Q] **Now let's talk about finances. At first glance, it seems that seeking external financing or investment is a must for any new start-up. However there are both advocates and detractors of this idea, raising the debate between whether external private investment could and/or should be avoided. What do you think? Are you in favour of growing fast through investment, or slow and through your own profits?**
[A] Both sides have a point. For us, as a Deep Tech company we needed a lot of product development, so we deemed it necessary to seek for external investment to finance our work prior to reaching the market. ***Without this, it would not have been possible, or it would have taken us longer, which could have had a negative impact on our project***. Besides, we believe that when a company gains "momentum", they can only make the most of it thanks to a financial push.

[Q] **In your experience, do you think that institutions are sufficiently supportive of start-ups? How could the public sector contribute to help entrepreneurs? How would you rate APBA's support?**
[A] We have been granted public funds, e.g. from the Ministry of Science and Innovation. There are several government assistance options in Spain for newly created companies. ***You have to be thoroughly informed and the application process involves a lot of work*** , but if you can prove to them that you have a strong project and a proficient team to implement it, it is possible.

Our collaboration with APBA was very positive and efficient. They stood by us in order to find a solution for a very common issue in the port industry - the traceability of vehicles and goods in their facilities. Not only did we get the gist of reality at the port, but also we fine-tuned our value proposition.

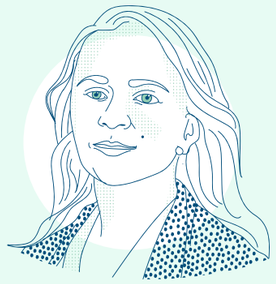
[Q] **Let's move on to the current crisis caused by the Covid-19 pandemic. How are you tackling this situation of uncertainty? Is it affecting your business model? How?**
[A] During the first months, uncertainty slowed down our customers' decision-making process, and we had to leave certain projects, i.e. related to the airline industry, which came to a complete standstill.

However, AllRead MLT grew from 4 to 12 people during 2020, and our turnover had a tenfold increase. Actually, the pandemic has not slowed us down, but has compelled us to focus more sharply on our business. Also, as many know, ***Covid-19 accelerated a digital transformation in companies, which particularly favours the ones focused on the automation and optimisation of processes.***

[Q] **In this regard, which are the future horizons for AllRead? Where do you picture yourselves in 3 or 4 years' time?**
[A] AllRead MLT is a technology and innovation company. We will keep on developing our solutions and collaborating with our partner, the Computer Vision Centre in Cataluña, to further improve and offer cutting-edge technologies every step of the way. In 3 years' time, we will have strengthened our presence in Spain and Europe (we are currently in 5 countries) and we will have accessed other fields, in addition to logistics and public services, with new smart vision and AI solutions.

[Q] **Finally, what is the most important lesson you have learned throughout your career as an entrepreneur? Which tips would you give to someone thinking about launching their own business on, for example, the market of port logistics?**
[A] Since our solution can fix many issues in several fields, we have learned that ***focusing on one sector, for a specific problem, is key to us not diluting our resources and efforts***.

In order to become an entrepreneur in the industry of port logistics, my tip would be ***to develop and validate projects with several ports, differing among themselves in sizes and features, so that the finished product can be adapted to any scenario.*** ■



Dita Bruijn

Director of Operations at PortXchange

Dita Bruijn is Director of Operations at PortXchange, a start-up founded in Rotterdam (Netherlands) that provides innovative digital solutions to shipping companies and port communities around the world. With over 13 years of experience in the shipping industry, Dita applies her extensive experience into operational excellence and digital transformation, to boost innovation and to make port calls more efficient and sustainable. A Graduate in Marketing and International Trade, before joining the PortXchange team, she worked in large companies in the industry such as Maersk, Damco and Kuehne+Nagel.

// *Port Call Optimisation, Just in Time Arrivals* and Digital Platforms.

[Q] Nowadays there is much talk about the concept Port Call Efficiency, or even Port Call Optimisation. Could you explain, in simple terms and for the general public, what this concept means? What does it entail and why is it necessary?

[A] A vessel port call is a process in which several economic and operational parties are involved, e.g. shipping company, terminal operators, Port Authority, shipping agent and other companies within the port community providing services to ships. Each stackeholder has its own objectives and processes, which can often lead to conflicts of interest with the others. Therefore, a port call ***should be conceived as a unique process, with the vessel at the center, around which all the parties involved must collaborate in sync to optimise it.*** In this context, the concept Port Call Efficiency can be understood as the reference indicator we use to assess the performance of port call processes, so that all those involved can focus toward a common goal.

[Q] It is true that we are talking about efficiency, but how is this value measured?

[A] In order to evaluate the level of efficiency in port call processes, at PortXChange (PXP) we deem it appropriate to divide the process into 5 steps:

- ***Just in Time Arrival –*** from previous port to port of destination.
- ***Arrival to the berth –*** from pilot's boarding point to dock.
- ***Berth visit –*** the stay in terminal.
- ***Next visit –*** if the ship visits more than one terminal within the same port.
- ***Departure –*** Ship's departure process until pilot disembarks.

In this regard, and through all the data obtained from the port community and shared on the PXP platform, it is possible for us to know exactly what the port call schedule is. Later, through real data and AIS data, we can measure whether the expectations of the schedule were met. Any differences between what was scheduled and what actually happened, are considered waste (idle). This means that each port call can be scored between 0% and 100%.

[Q] What are the main causes of inefficiency, and to which extent can the main container ports and hubs improve?

[A] So far, we have witnessed a positive trend and good results when it comes to Just-in-Time areas and at the dock visit stage. Nevertheless, there is a considerable difference among ports and also among port terminals. The main causes of inefficiency, or chances to improve and challenges for the industry, continue to occur when it comes to arrivals in port and the Just-in-Time paradigm. There are also important operational challenges related to the provisioning process of fuel by sea and its impact on the departure process, partly due to a lack of visibility and coordination. With each Port Call Optimisation project and initiative, the first thing we do is define with the Port Community where the main operational challenges are, to then decide on a particular improvement project to achieve a specific objective.

Thanks to the PortXchange technology platform, the Port Community is offered a tool that ***represents an important leverage for change, as it simplifies the achievement of common objectives at each step of the port call process.***

[Q] What are the main measures and solutions that can be implemented in the port industry to improve efficiency? Who and how would they benefit from the implementation of these solutions? [A] The first step is for all parties involved in a port call to use the same communication standards to be able to speak the same language. If we are talking about the Estimated Time of Arrival (ETA) of a ship in port, it is important that we all refer to the same point and place of reference. Today this is one of the main challenges in the port industry.

By using digital platforms for Port Call Optimisation, together with new technologies, ***logistic operators and other key stakeholders can be assisted when making decisions based on updated information, more proactively and in real time.*** Better communication and cooperation make it possible to save time and money, and to avoid unnecessary emissions. As for shipping lines, emission levels and operational costs resulting from the consumption of fuel could be reduced by being better informed. Port Authorities could mitigate emission levels caused by port activities, and reduce delays and idle times, improving the quality of services. Terminals could reduce idle times too, and optimise the productivity of docking lines. Finally, shipping agents would be able to offer a better service to their customers when being better informed. Furthermore, it has been proved that bilateral commu-nication (calls, emails), significantly focused nowadays on finding out and checking the current situation of the ship, could be decreased by up to 80%. Instead, this information would be displayed in real time on the platform, shared unmistakably by the entire Port Community.

[Q] Secondly, and directly related to the concept of Port Call Efficiency, we have Just-in-Time arrivals. What are the challenges today, and how could things be improved?

[A] There is an increasing pressure to reduce emissions brought about by sea transport. In this context, the concept of Just-in-Time Arrivals is defined as an effective way to reduce emissions with little investment in comparison with other solutions (e.g. readjustment of ships' propulsion engines, new alternative fuels, etc.) This initiative consists of ***improving communications among agents from the port community, port agents and ships.*** By doing so, we could avoid situations such as a ship arriving in port with an unnecessarily high cruising speed, which consequently needs to wait before entering the port until docking and port resources are made available.

[Q] An already widespread and key solution to improve port efficiency and promote Just-In-Time arrivals is the use of international standards when exchanging information among all port stakeholders. From your point of view, how is this issue being addressed, and what would be the point of reference, taking into account the different initiatives in this regard (DCSA, PCO Taskforce, STM, etc.)?

[A] ***Having communication standards is essential*** for any digital transformation project, and also to ensure the success of the Just-in-Time Arrival initiative. At PXP we work with the standards defined by Taskforce Port Call Optimisation, which have been credited by IMO and the industry, and which are applicable to all types of cargo. They also collaborate with DCSA, focused on traffic of containers.

[Q] Thirdly, we would like to ask you about PortXchange. What is it? How does it add value? What is your main mission? Where and how is it being used? Do you reckon we are at a key moment ›

for the development of technological solutions in the shipping industry? What do you make of the Port of Algeciras in this sense? [A] PortXchange is a digital platform that gathers all the information related to a port call and displays it in real time for all port stakeholders. It contains a combination of several levels of information: port master data, real-time location of ships and schedule of shipping lines, shipping agencies, terminals, service providers, technical-nautical services, etc. This information is completed by technologies such as machine learning, in order to anticipate and inform users through alerts and notifications when relevant events are expected to take place throughout the process, or when something is not going to match what is scheduled.

The users of this information are the port relevant parties who need access to up-to-date operational information at all times. We have been working for several months with Maersk, APMT, Marmedsa and APBA in the Port of Algeciras, and we have noticed that, ***thanks to digital transformation and immediate availability of key data, knowledge and operational management have been improved.*** And it is bearing fruit, e.g. regarding waiting times at terminals. We look forward to gathering more data and stakeholders in the Port Call Optimisation project in Algeciras, and to being able to add further value for the benefit of the whole Port Community.

[Q] Lastly, how would you convince these port community agents to take part in the collaboration platform? What would their participation in PXP provide them at the Port of Algeciras?

[A] Agencies play an essential part in port call processes. It is important that the information they manage and coordinate, e.g. about ship services, estimated arrival times, etc. is available to the entire port community. In addition, it is crucial for the shipping agency to be aware of every single schedule change at port, in order to readjust their tasks accordingly. In this context, the average feedback of shipping agencies joining our projects has been very positive, also in the Port of Algeciras.

Dr. Francisco J. Fernández

Lawyer and partner of Cremades & Calvo- Sotelo

Francisco J. Fernández is a partner of Cremades & Calvo-Sotelo Law Firm. Doctor of Law and Legal Practitioner, he is specialised in public procurement, legal status of the public sector, business organisation and strategic management. He is also an expert in public-private collaboration models and investment mana-gement. Law and Business Professor at Loyola University, he is also the chairman of the Innova University-Enterprise Forum, and member of several Committees of the Confederations of Entrepreneurs in Andalucía and Sevilla (CEA and CES). Previously, he was Director at KPMG in Andalucía and Extremadura, where he managed the business, public procurement and technology areas. He was also Director of the legal and compliance department at Ayesa, where he led the transformation plan for their various business units.

// Public procurement of innovation and public-private partnership.

[Q] In these current times of uncertainty, much is said about digital transformation and innovation being the key vehicles for companies to achieve organisational agility, which would allow them to effectively manage their businesses. In this sense, the concept of public-private partnership is often involved. How would you define it?

[A] Public-private partnership (PPP) is based on a keenness between the public and the private sectors to work together. It is a legal formula with a fundamental prior component: the certainty that there are public policies whose success is only possible by developing synergies between private operators and public regulators. Back in Roman Law times, the expression affectio societatis was coined as a result of the joined experiences of the public and private sectors.

Therefore, ***PPP not only needs to be regulated, but also requires the public sector to act willingly, to include PPP from the earliest stages of public policies' planning.*** This is not to the detriment of legal certainty. The fact that these potential solutions are processed on a competitive basis, openly and fairly, makes it possible for the public sector to choose the best option at the best possible price.

[Q] From your experience, do you think that these new formulas of public-private partnership are sufficiently applied in Spain at the moment (e.g. Public Procurement of Innovation or Association for Innovation) to stimulate innovation and economic competitiveness?

[A] Truth be told, statistics show that we are still not making the most of the PPP formulas, but from 2019 onwards we have noticed an increasing encoura-gement to use these tools. We have an education-related issue. PPPs either remain unknown or are not properly explained within the public service. And neither are private companies sufficiently familiarised because they are generally unaware of their existence or they find them too complex to commit to them. The lack of a catalyst acting as a transmission belt among the main parties has also been a challenge. For this reason, ***we suggest setting innovation observatories and management offices.***

[Q] In which areas are they mostly being used?

[A] It is true that the role of the public sector as an innovation engine has been reinforced, and the development of new innovating markets has been promoted. Today the most common areas are healthcare, infrastructures, technology, and publicly-regulated industries such as ports, energy, etc. ***They share a common element: they all need the private sector's expertise for a better service delivery.***

[Q] Could you briefly give us an example where the application of a PPP model was successful?
[A] I have taken part in many, both in and outside Spain, and applied to a wide range of industries. Since the contract regulations in 2007 (in accordance with European Directives), I remember success stories such as the development of the Port Consortium in Barcelona, the Metro in Sevilla, the City of Justice in Córdoba, the development of the Critical Infrastructures in Andalucía, the Metro in Panama (PPP), or the Fashion Training Centre project in Sevilla. And the BrainPort project in the Port of Algeciras, too. And there are more success stories, such as the Business Forum in Madrid.

[Q] What advantages and benefits do these new formulas provide both to the public and private sectors, in comparison with the current bureau cratised model? Is the current model deprecated?
[A] The current model is not deprecated, but out of focus. It is focused on the proceedings, rather than on the purpose of projects and the usefulness of investments. ***The PPP helps to set-up a methodology which is compatible with the public sector law for contracts making the whole process more efficient and effective.***

On one hand, the public sector would reach a level of administrative simplification that could not be achieved in any other way. On the other hand, the private sector stimulates the market; promotes the spreading of innovative products, services and technologies; provides a field for experimentation; and irealises a market for the creation and launch of ideas for public policies that would be very hard for the public sector to achieve on its own.

[Q] What do you consider necessary for the public sector to bear in mind this new mechanisms and open their doors to the entrepreneurial ecosystem of SMEs and start-ups?
[A] In my opinion, as I mentioned previously, there is a lack of knowledge about this matter. But, above all, ***there is a lack of vocation to collaborate.*** There are still areas of the public sector where the private sector is perceived as "governed private individuals" rather than "collaborators." We need to promote a Renaissance culture where public sector and companies tackle challenges together. In this regard, I believe that communication and training mechanisms are needed, to prove that the best niche policies for SMEs and start-ups are the ones based on an "affective" support when it comes to deploying joint innovating projects. This is not just me saying it - this is European Directives saying it.

[Q] How would you rate the role of APBA in this sense?
[A] I am glad that you ask me about the role of APBA, because in my opinion they are a role model. ***They have been able to understand that PPP is essential to guide objectives, to grow and to help the industry.***

They have regarded technicians as the core of their activity. They have been able to take advantage of these mechanisms and tools to promote both innovation and technology through the key role of entrepreneurs, in order to turn the Port of Algeciras not only into a Smart Port, but also into an exemplary Port.

[Q] We are talking about new technologies and innovative solutions, but how can the public sector keep up-to-date and quickly detect these innovative technologies and projects that they may find interesting and useful?
[A] By creating stable communication channels with the private sector. Technical departments, monitoring offices, market consultations, groups of experts, etc. Investing in their implementation would allow them to cover all the responsibilities involved, to assume their unifying role and to provide solutions.

[Q] What would you say to someone thinking about using these new formulas? What aspects should public sector entities bear in mind, not to lose heart when jumping on the Public Procurement of Innovation or the Association for Innovation bandwagon?
[A] Above all, I would encourage them to consider these options, to consult with experts in the field, and to commit to thoroughly defined action plans.

These formulas are not suitable for every project. ***They should also provide their staff with training. It is not easy to work on matters in which law and innovation are intertwined.*** They must bear in mind aspects such as the evolution of needs (prioritising is vital), the work team, the business model, the alliance methods for joint procurement, the total costs, the legal considerations regarding intellectual property, risks and financing.

[Q Finally, what is Government or Corporate Venturing and what would be its main potential?
[A] The main feature of Government or Corporate Venturing is to make the most of the driving force or regulatory leadership of a public sector entity, in order to promote collaboration with other agents, and thus creating an ecosystem of innovation and joint reflection. Deploying research and development projects, but also thinking twice about the challenges in the industry. Summarising, this is a new entrepreneurial formula whose advantages consist of the support and leadership of a consolidated entity, and the motivation and high potential of a start-up. Both share the common target of increasing innovation and productivity. ***In short, it is a "short step and long view" system.***

[Q] Would its inception be feasible from the public sector?
[A] Absolutely. APBA made another success story. This public body provides the start-up with its experience, knowledge of the market, infrastructures, resources, productive asset; in turn, the start-up offers the former its versatility, maximum specialisation, a great ability to manage risk and take advantage of new market niches, as well as the development of innovative solutions. Corporate Venturing must be premised on ***mutual support between the public entity and the start-up for their common good. To do so, a secure regulatory environment, as opposed to a cumbersome, heavily bureaucratised one, needs to be created. This can be done through strategic procurement plans for innovation.***

[Q] Which formulae would you recommend the public sector to go for when collaborating with start-ups? [A] I would recommend them to invest in start-ups and discover that the new governance of the public sector requires the creativity and drive of the private sector. To veer its corporate culture to digital transformation and new entrepreneurial ecosystems.

To recruit talented staff in order to gain agility in working methods and increase efficiency through a single, yet shared, effort toward innovation. ■

04.

An overview of the figures

GATHERING AND SELECTION OF IDEAS

12 Received ideas

85% External proposals

21 Participants

6 Selected Stage 2

17 Business Case

2020

109 Ideas accumulated since 2017

Transferred to RD&i project portfolio **33%**

INNOVATION TOOLS

Innovation ranking

1. Daniel Andrades	11 ideas
2. Francisco de los Santos	10 ideas
3. Jesús Matute	5 ideas
4. Paco Saucedo	5 ideas
5. Jesús Medina	5 ideas
6. Dani Hernández	4 ideas
7. Enrique Martín	3 ideas
8. Jorge Lopera	3 ideas
9. María Román	2 ideas
10. Javier Moratalla	2 ideas
11. Luís Cintrano	2 ideas

Innovation Portal

261 Users registered to the Portal

396 Subscribers to the newsletter

+90.000 visits

+14.000 new users

RD&i PROJECTS

4 Ongoing projects

5 Closed projects

OPEN INNOVATION - PORTS 4.0

70 Start-up proposals

70% Feasibility and fit analysis

48 Supported proposals

Puertos 4.0

3 Ongoing pilots

INNOVATION CULTURE

19 Updating and training sessions in areas such as Data Analytics or Cybersecurity

We issue a quarterly technology prospective newsletter

We complete the 2nd edition of the Innovation Awards

Webinars

We launch the first programme of webinars on digital business tools for all employees

SOCIAL IMPACT

24 Press appearances of innovation activities

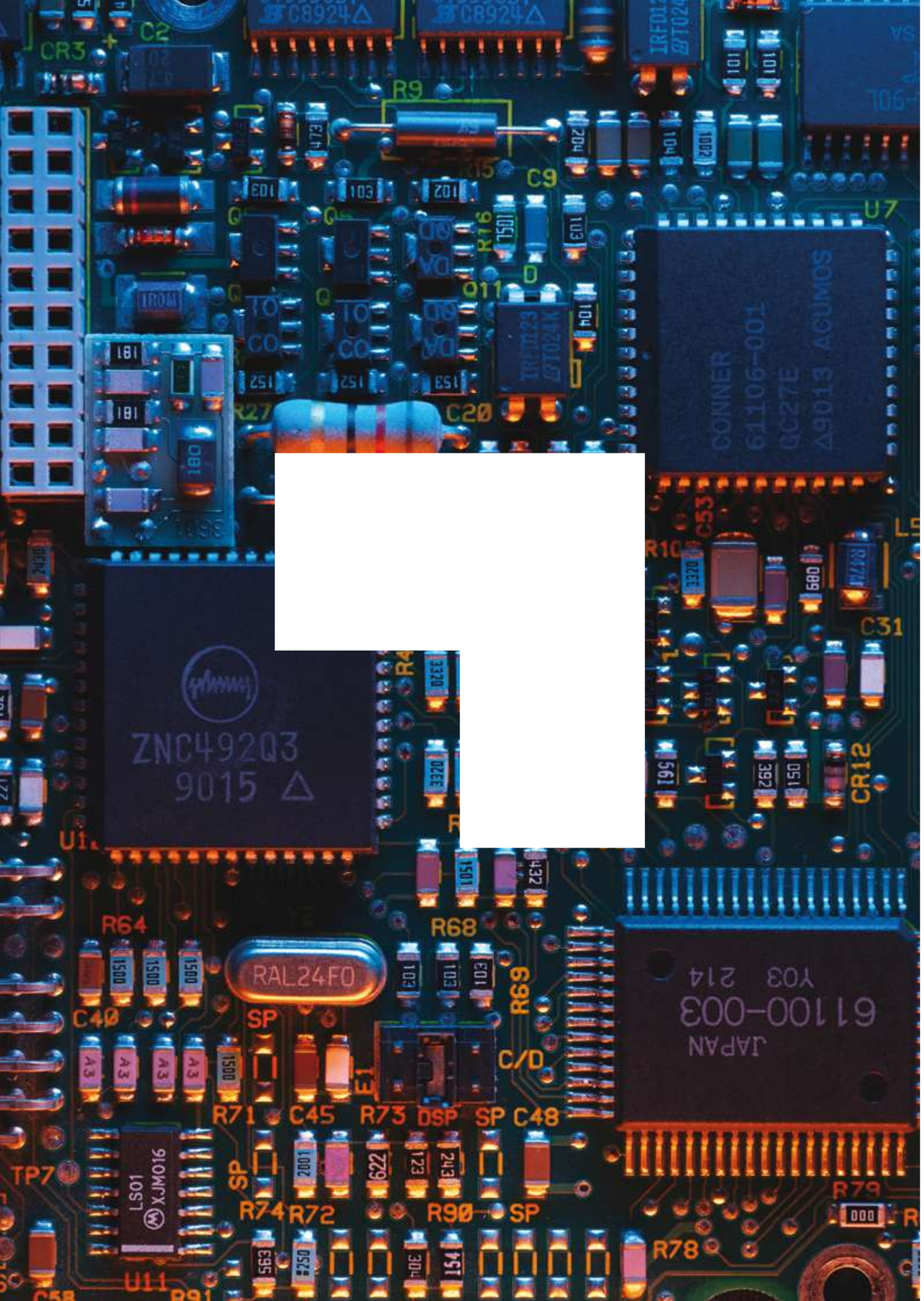
48 accumulated topics

Participation in events and conferences **12**

Over 1,500 attendees

7,74*

*APBA regarded as an innovating company by their employees



05.

RD&i Projects

// Autonomous traceability and geolocation of ro-ro cargo with Artificial Intelligence.

APBA has successfully tested and validated an innovative solution in the field of advanced data science and artificial intelligence, within the framework of its open innovation programme and in collaboration with IDOM through the Technical Innovation Office, and **Amazon Web Services.** Through the challenge of implementing the autonomous traceability and geolocation of ro-ro cargo within the heavy goods terminal (TTP) of the Port of Algeciras, they aim to more efficient and effectively manage port resources. For this purpose, an **innovative solution has been developed,** based on **advanced Computer Vision and Machine Learning techniques,** which allows to obtain, process, analyse and understand images taken by the full HD video cameras within APBA's Imaging System.

Ultimately, the goal is to identify and monitor lorries passing through the TTP, and automatically detect targeted events by analysing images and videos, e.g. occupied vs free parking spaces.

In addition, thanks to Machine Learning techniques, visual recognition algorithms have progressively increased their learning capabilities. This means that algorithms become more and more refined as new data is added, making the predictive method more precise. This new compatibility has been built through **Amazon SageMaker,** and the algorithms to classify images and detect targets, trained with historical data from APBA, have been developed ad hoc by IDOM team and implemented in AWS cloud. This solution will **enhance cargo management and location operations** at the TTP rotating area, **hence reducing service times** for the collection of STUs, platforms and semi-trailers from this storage area, both by dockers and carriers.

It is important to point out that the TTP is considered one of the cores of the Port of Algeciras when it comes ›

to ro-ro cargo transportation through the exchange channels between Europe and Morocco.

// Development of a machine learning algorithm combined with an optimization model to support berth allocation and facilitate JiT arrivals during OPE.

One of the main data used as a reference to schedule and manage port operations are Estimated Time of Arrival (ETA) and Estimated Time of Departure (ETD). The shipping agent needs to inform and update about such information. But generally, after the port call request occurs, estimated time data tends to remain static and is not updated as would be desirable, despite changes, delays and incidents arising indeed. This results into more challenging day-to-day operations due to the need of dealing with unexpected delays. In the specific case of **ferry/RoPax passenger ships in the Strait of Gibraltar,** operational management is even more complex since delays in rotations may affect the following port calls scheduled for the entire day. These scenarios can be further complicated during OPE, when 14 ships from 5 different shipping companies rely on 5 berthing spaces at Dársena de la Galera Terminal.

To handle these cases, a pilot project was developed with the **aim** to obtain (1) updated data in real time about the location of ships, (2) updated predictions or estimated times of arrival and departure, and (3) an optimisation model that takes into account possibly global delays within each schedule, in order to readjust operations (e.g. times, docking spaces, etc.) and ensure an excellent quality of services for end users.

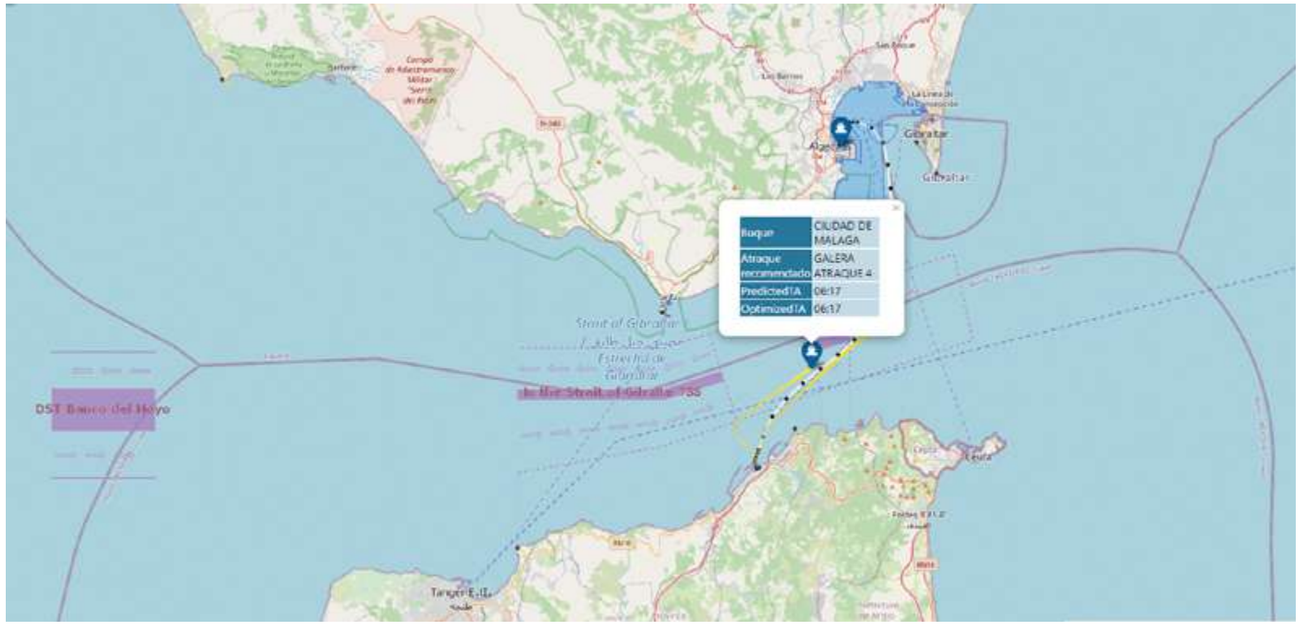
This is why the **prototype of an expert and predictive system was developed, which would assist the decision-making process as regards the berth assignment for ferry/RoPax ships.** This expert system has two components: a predictive model to estimate times of arrival in port, and a mathematical optimisation model to manage docking operations and waiting times for ships arriving in port. The **predictive model** aims to estimate times of arrival in port of the ferry/RoPax ships with scheduled port calls in the next few hours at the Port of Algeciras. To do so, the following factors have been taken into account: current location through AIS data, delays occurred in previous rotations, historical behaviour patterns of ships and/or shipping companies, hour/day of the week, departure/return operations, weather conditions (wind and waves) and even the effect of the holiday calendar and pilotage exemptions.

Moreover, the **mathematical optimisation model** (linear programming) makes it possible to readjust berth allocations throughout the day as port calls take place. Said optimisation model is based on an objective function characterised, on the one hand, by minimising the difference between the time of arrival proposed by this model, and the one offered by the prediction model. On the other hand, docking preferences, based on the "virtual" costs involved when ships are allocated docking spaces other than their "preferred/favourite".In other words, if at the predicted time of arrival of a ship there is no preferred docking space available, the possibility of delaying its arrival may be considered, so that it can be allocated said docking space, or else a different one may be allocated, maintaining the predicted time of arrival. The optimisation model will opt for one or the other option depending on the result of their decision-making process.

As **a result of this optimisation model,** a berth allocation proposal and a required time of arrival (RTA) are made available for every upcoming port call. Both options will be adjusted according to the optimisation criteria chosen in each case, so that docking and time of arrival changes can be set. The latter should be done in such a way that the ship can reduce its cruising speed accordingly for a Just-in-Time arrival.

The **conclusions** drawn from the proof of concept are:

- It has been shown that predictive models, since they deal independently with multiple factors regarding estimated times of arrival of ships in port, offer a better assessment of possible delays in comparison with average delays of the fleet as a whole.
- The predictive model, by using AIS data, makes it possible to obtain accurate information in the short term, and so, to make the appropriate operational decisions. In the medium term, it helps us focus on certain port calls with specific estimations of delay, which require special attention.
- Optimisation models allow, in a very simple and agile way, and on the basis of predefined criteria and objectives, to set precise docking times and re-allocate docking spaces, taking into account their possible results in the future.
- The optimisation model realises port call schedules daily, on the basis of predefined criteria and with a minimised risk of future allocation changes, and the reason for this is a more regular distribution of said port calls.
- Lastly, having such an optimisation model makes it possible to devise a guidance fleet plan (blueprint) to avoid, as far as possible, future delays and changes.



// Technology for the prevention of Covid-19 spreading in the Port of Algeciras: Body temperature and crowd control.

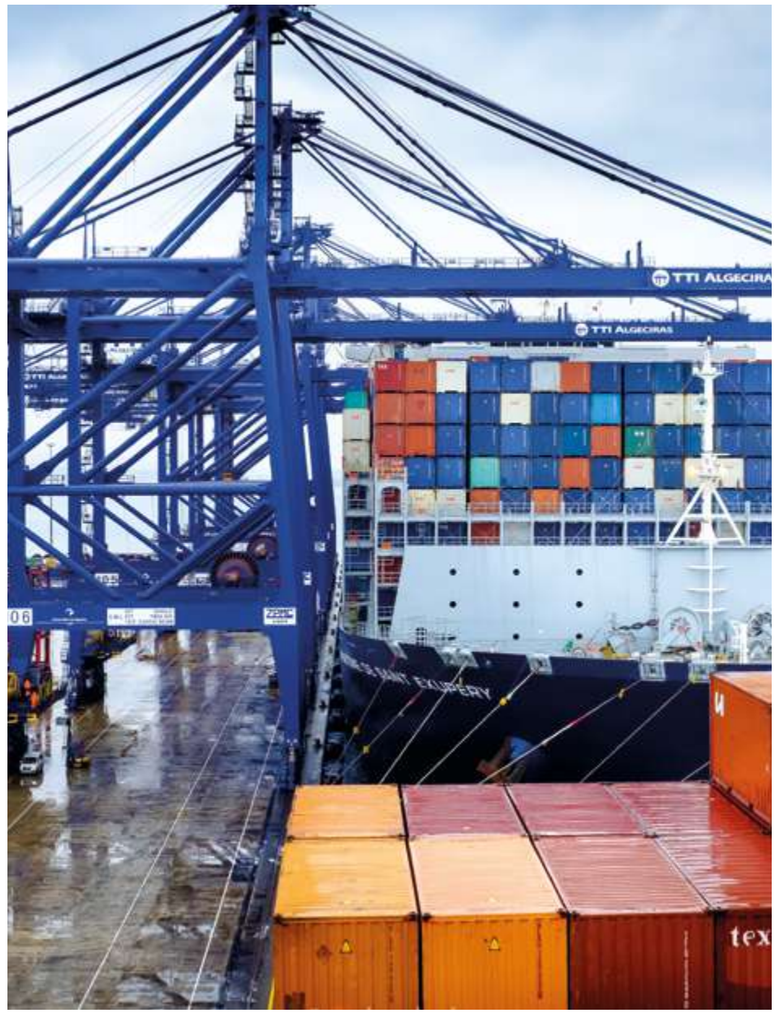
APBA installed thermal-imaging cameras in the busiest areas of the Port of Algeciras within the framework of a project that was planned as a pilot at a technological and operational level. In this way, the dock by the Strait of Gibraltar, visited each year by over 4,500,00 passengers usually linked to Ceuta and Tangier Med, ensures an increased safety for customers and employees who go through the port facilities. The system operates in multiple locations, such as the boarding area to Ceuta at the passenger terminal of the Port of Algeciras, where residents of Ceuta authorised by the Government Delegation in their city, embark on a daily basis.

This project was possible thanks to the agreement reached between the Port Authority, a consultancy specialised in communications and safety, XAIVO, and DAHUA Technology, manufacturer of video-surveillance solutions. Their common aim was to implement technologies for the prevention of Covid-19 or other future pathogens spreading, by monitoring two factors: **body temperature and number of people gathering in the port facilities**.

The system is able to detect risks of transmission by monitoring **body temperature anomalies** (fever) over a constant flow of people, quickly (automatically and without interrupting said flow), with high precision (± 0.3ºC) and contactless (in order to protect control staff). These features are combined with an attendance control system to monitor the **number of people attending** and determine the level of risk.

After the implementation of these systems, the Port Protection Control Staff operates in various areas of the port through hand-held terminals connected to the private radio communication network of the ports managed by APBA and known as **Advanced Radio Communication System (SACR)**. This way they can receive alarms for possible individuals carrying and transmitting the disease (when body temperature anomalies are detected), and thus establish protocols to mitigate the propagation of the virus through instant and effective communications.

These body temperature and crowding monitoring systems, combined with internal communications via SACR covering the entirety of the port facilities run by APBA, **assist in the protection and safety of passengers and employees involved, against the propagation of pathogens.**



// European Project EPICENTER (Enhanced Physical Internet-Compatible Earth-frieNdly freight Transportation answER).

APBA participates in the European Project EPICENTER, focused on allowing a seamless transport of goods, focusing especially on the technological and operational opportunities that the Physical Internet, synchro-modal operations and other disruptive technologies such as Hyperloop, Industry 4.0 and autonomous vehicles provide.

The project, funded by the Horizon Europe 2020 programme and with a completion deadline of 42 months, aims to develop innovative systems with the ultimate tangible effect of more efficient and sustainable logistic chains. A series of large-scale tests on new solutions in major shipping routes from Europe to Canada and the US will be conducted, as well as in new trade routes such as the North Sea Route and the new Silk Routes. The overall concept is to establish an interoperable living toolset of software tools, services and methodologies which can be rapidly deployed/used by a wide range of public and industry stakeholders to address the many challenges and issues relating to multimodal freight transport systems and logistics operations. Within the project, a wide range of solutions will be provided, **validated in real environments**, with a view to responding to the topic "InCo Flagship on Integrated multimodal, low-emission freight transport systems and logistics", included in the European call "Mobility for Growth". Among other examples of use, the following ones are included:

- Applying emerging technologies and logistics concepts such as AI, Blockchain, synchromodality and the Physical Internet to major international and intra-European routes to understand their impact and potential benefit in terms of improved use of infrastructure and capacity. ›

- Using advanced algorithms and innovative research methodologies to understand better the impact of new Arctic and Silk Road routes, addressing environmental and socio-economic factors, as well as the effect on freight flows and consequential interfaces/nodes capacity needed to link EU and Global networks.

- Optimising multimodal transfer zone operations, especially in the context of innovative modularization concepts, new freight flow strategies (e.g. "bundling") and new transport and handling modes (e.g. Hyperloop, robotic vehicles) to advance towards seamless door-to-door operations in an Industry 4.0 world.

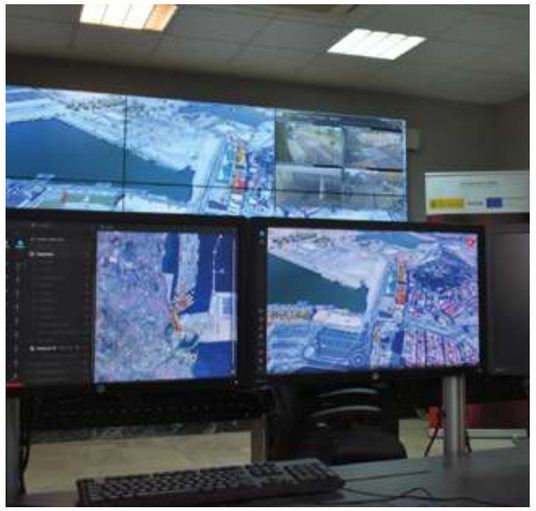
FIt aims to become a **"live tool-kit",** meaning that EPICENTER will not just be a static set of applications and tools, but will also provide a framework that makes its organic growth possible beyond the end of the project. For example, as new data sources, research methods and algorithms are developed, it will be possible to easily add them to the EPICENTER family. During the project, the appropriate governance, standards and development plans will be established to promote this process once the project is completed. This will ensure that, in the future, EPICENTER continues providing answers to new questions and challenges arising.

APBA will take part in work packs 2 - *Global Visibility Technologies & Governance*- and 4 - Demonstrators, Showcase & Lessons Learned. In addition, APBA will provide support in the cross-cutting communication and dissemination activities of the project, taking advantage of its experience managing its own initiatives, i.e. the **Algeciras BrainPort 2020** and Innovation Journey programmes.

// Modernisation and optimisation of operations, security and protection systems through 5G technology.

This project is included in the initiative **"Pilot 5G Andalucía"** led by the Ministry of Economic Affairs and Digital Transformation through the website www.red.es, and currently being developed by **Vodafone and Huawei.** The project applies to 33 examples of use in industries such as energy, smart cities, tourism, agriculture, healthcare and dependency, security, emergencies and defence, society and digital economy.

The **aim of the project,** in which the Port of Algeciras is included in a consortium headed by Vodafone spain and Huawei Technologies Spain is **to test through 5G technology new technological capabilities of infras-tructures, and to discuss how to support innovative applications within the scope of the port security, operations and infrastructures.**



To do this, a special 5G network deployment will be carried out that will cover all the facilities and areas of the port in order to evaluate, by **putting into practice two examples of use,** whether 5G technology can contribute to speed up and optimise port operations.

The **the first use-case,** called **«5G Port»**, was created with the intention of **modernising and enhancing the existing information, protection and security systems of the port,** strengthening their pervasiveness, agility and diversity, thanks to the benefits resulting from the implementation of a 5G network. More particularly, the pilot project aims to improve aspects within the following scopes:

- Ongoing input of high-resolution content transmitted through mobile cameras added to the existing CCTV, specially intended for critical cases and without detriment to other services.
- Integration of high-quality (4k) cameras to the existing imaging system, to transmit video in real time from fixed angles, as well as in motion.
- Extension of the services offered by the SG3iEV platform to the onsite staff by making it available while moving, and by using Augmented Reality (AR) to superimpose computer-generated, geolocated information on each employee's real location and in real time.
- Completion of synchronised maintenance tasks using bi-directional streaming of video and audio in real time. At the control centre, the technician on duty will be able to provide guidelines and orders in graphic format that will be displayed on the employees' AR glasses. The former will also view the 'augmented' information in the local environment.

In addition to the afore-mentioned advantages granted by 5G technology, faster responses are delivered by the onsite staff members. This notably contributes to simplify and add flexibility to their working method. notable. With regard to the **the second use-case** within the pilot project, called **"Real-time recognition** ›

system for security environments", proposes to develop a **guidance and support system for passengers** who visit the Port of Algeciras, specially when OPE takes place. The purpose is to find synergy with the Multi-access Edge Computing (MEC) systems from the 5G network.

This system proposes the development of automated recognition of registration numbers in real time in order to provide customised information and guidance to passengers when visiting certain areas of the port. The application of this feature would help solve logistic and organisational issues in a scenario characterised by mass influx situations each year during OPE.

The ultimate goal of the project is to assess whether 5G technology can contribute to speed up and optimise operations, security and protection systems at the port. To this end, the development of both examples of use would help reach the following specific objectives:

- Optimisation of port controls thanks to seamless and high-quality video available, as well as an increased number of cameras, without detriment of these or other coexisting communications.
- Improved response times and more efficient resolution of issues, combined with onsite monitoring via access to technical data from various systems, from anywhere in the port and in real time. This offers a more complete, dynamic and instant view of all relevant aspects (ships, infrastructures, channels, etc.) in order to increase the autonomy and productivity of the staff.
- Improved precision and broadened application of the advantages of remote assistance by specialised technicians to onsite staff, through bi-directional transmission of audio and video in real time.
- Improved information systems available for passengers in order to manage and optimise the movement of vehicles within the port.

// APBA prepares the creation of the new Centre for the Coordination of Processes and Port Protection at the Port of Algeciras.

APBA will invest over 4 million euros to refurbish the old fire station at the Port of Algeciras. Once this has been done, the property will be renamed **Centre for the Coordination of Processes and Port Protection**, and it will serve as a centralised venue for a set of services that will ensure port operations 24 hours a day.

At the end of this year, the invitation to tender is at the stage of submission of proposals, and its allocation is expected to take place at the beginning of 2021. The fire station at the Port of Algeciras was built in early 2012 and was in operation for a relatively short time. In May 2015, APBA reached an agreement with the Provincial Consortium of Firemen of Cadiz (CBPC) in relation to the services provided by the latter, which were discontinued from then on.

As for Port Protection, APBA port police has had its department at the Southern Access of the building since 2000. Several extensions, technological updates and improvements have been applied since. Nevertheless, the increasing number of agents made it necessary to eventually re-locate the port police to a larger venue in the medium term.

The works, with a set completion deadline of 17 months, will make it possible to add value to the building. It will house the Isla Verde Security Station once its comprehensive extension and refurbishment have been fully done. The architectural ensemble will have facades with white aluminium panels for ventilation. It will be integrated into its surroundings and equipped with all the necessary items to become an example of energy efficiency.

The part of the building reserved for Port Protection will be located in the original building, which constitutes an area of 3,000 square meters, and includes a large inner courtyard that will house the port police vehicle fleet.

The Centre for the Coordination of Processes and Port Protection will also occupy part of the original building and the extension, which will encompass a large operational section where multiple departments of APBA will be located, together with extra space to house official bodies in case of crisis. It will become the operational core of the port, more easily aligned with their strategic objectives.

The section will include the departments of Port Protection, Maritime Operations (Sea Transport Management and Coordination of Services for Ships), Road Transport, Rail Transport and Heavy Goods Transport. Additionally, natural light will enter the rooms from the roof, and sound-absorbing materials will be used to build them. All the functional areas of the Centre, both in the building being renovated and in the extension, will be connected through mezzanines. This represents a qualitative enhancement in terms of the technological level when managing port operations, specially in cases of emergency or during OPE.

The project establishes that both areas (Port Protection and Centre for the Coordination of Processes), can operate with a degree of independence when it comes to people entering and exiting the premises. A footbridge on the upper floor will link both areas. The project also refers to the integration of the architectural ensemble in the port environment. Its new design will make it possible for it to act as a screen from the entrance road, covering the operational areas of level ground nearby, where containers are usually placed. ■

06.

Innovation activities

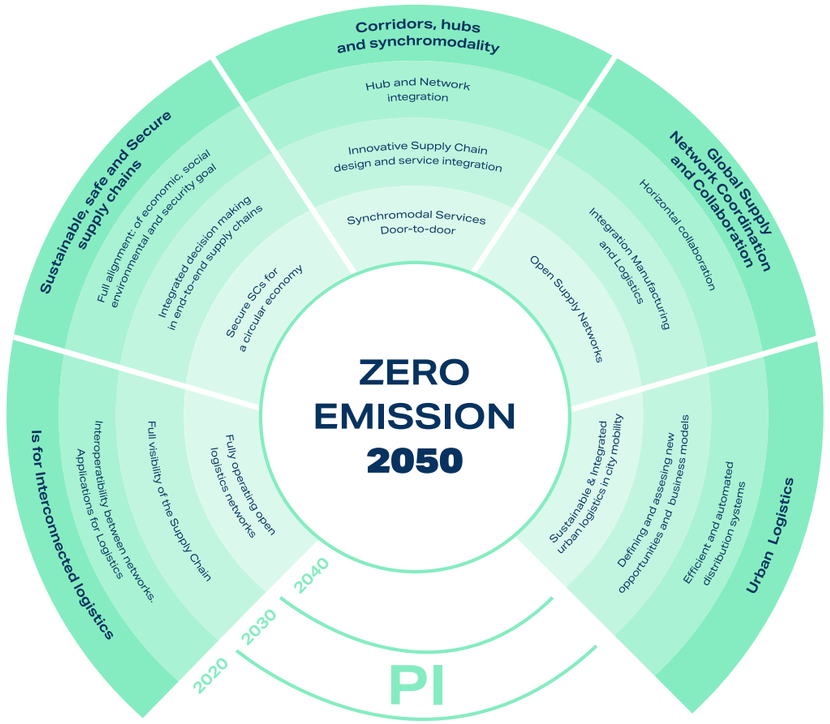
// APBA joins the European Technology Platform ALICE.

APBA has joined the European Technology Platform **ALICE** in order to be part of the breakthroughs reached in the field of the ***Physical Internet.***

ALICE, officially launched in 2013, was created to develop an innovation, research and implementation strategy in logistics, in particular when it comes to the supply chain within Europe. Its aim is to reach a more sustainable and competitive industry. A goal has been set to achieve a 30% improvement in logistic operations by 2030.

Research is focused on creating new concepts where collaboration and coordination continue to be reinforced and result in the Physical Internet - this means that collaborating and coordinating supply chains is carried out both horizontally and vertically. There are 5 working groups within ALICE, 4 of which have a strong influence on operational excellence, the concept of Port Collaborative Decision Making (Port CDM) and a future with an operational orchestration platform in the Port of Algeciras. Said working groups are: WG1 (Sustainable Safe and Secure Supply Chains), WG2 (Corridors, Hubs and Synchromodality), WG3 (Information Systems for Interconnected Logistics), WG4 (Supply Chain Coordination and Collaboration) and WG5 (Urban Logistics). APBA actively participates in WG2 and, particularly, in the Smart Ports group, together with Valencia, Antwerp and Hamburg, among others.

Currently, the following members stand out: the ports of Valencia and Barcelona, CDTI, ZLC, Grupo Sesé, KALEIDO, GS1 Spain, ITENE, CNC-Logística, etc. and, internationally, the port of Rotterdam, Hutchison Ports (ECT Rotterdam), P&G, L'Oréal, ESC, CLECAT, SCANIA, Fraunhofer, etc. APBA's participation in **ALICE will promote collaboration with universities and ongoing provision of updates about innovation while working with the main stakeholders of the logistics industry within the EU.** ›



Progressive research on the Physical Internet will also be a key point, for its results will be directly applied to the specific scenario of the Port of Algeciras. In addition, ALICE will support the implementation of the EU's Research and Innovation Programme "Horizon Europe 2020"

// APBA launches a new challenge to the start-up ecosystem on how to enhance the use of AIS data for port and environmental management.

APBA, through the **Port Innovation Atlas** programme, proposes a challenge to the innovation ecosystem with the aim to find start-ups and technology solutions on **how to make the most of AIS data to improve decision-making and operational aspects.** Among others, AIS data could be applied to: **safety in navigation, ship performance assessment, environmental effects (e.g. inventory of ship emi-ssions by dock or port area), docks and terminals efficiency evaluation, trade routes density controls and port service** quality checks. Start-ups are encouraged to further reflect on the promising solutions that could result from the use of AIS data.

Port Innovation Atlas was launched by **PortXL,** one of the world's first maritime accelerators of start-ups, with which APBA has been collaborating for some time. Thanks to its broad experience and knowledge of the start-up ecosystem, and with the aim to promote innovation and collaboration in the industry, PortXL has made this new scouting service available to ports by using its web platform as if it were a marketplace. In other words, port authorities can post their innovation-related challenges and, in turn, start-ups can show their interest in them and propose solutions. It is important to point out **that port challenges posted through PortXL are viewed by over 2,500 start-ups** that have been previously verified and assessed in detail. Several internationally renowned ports such as New York & New Jersey, Barcelona, Gothenburg, Rotterdam, Le Havre, Hamburg, Vancouver and Los Angeles have been posting their challenges on PortXL. These are mainly focused on digital transformation, optimisation and sustainability of supply chains.

›››››› SCAN THE QR ››››››
Those interested in **providing solutions to the challenge posted** by APBA can submit their proposals via QR.

// APBA is the winner of the FIWARE Zone IoT Challenge 2020, a joint initiative by the regional Council of Andalucía and Telefónica.

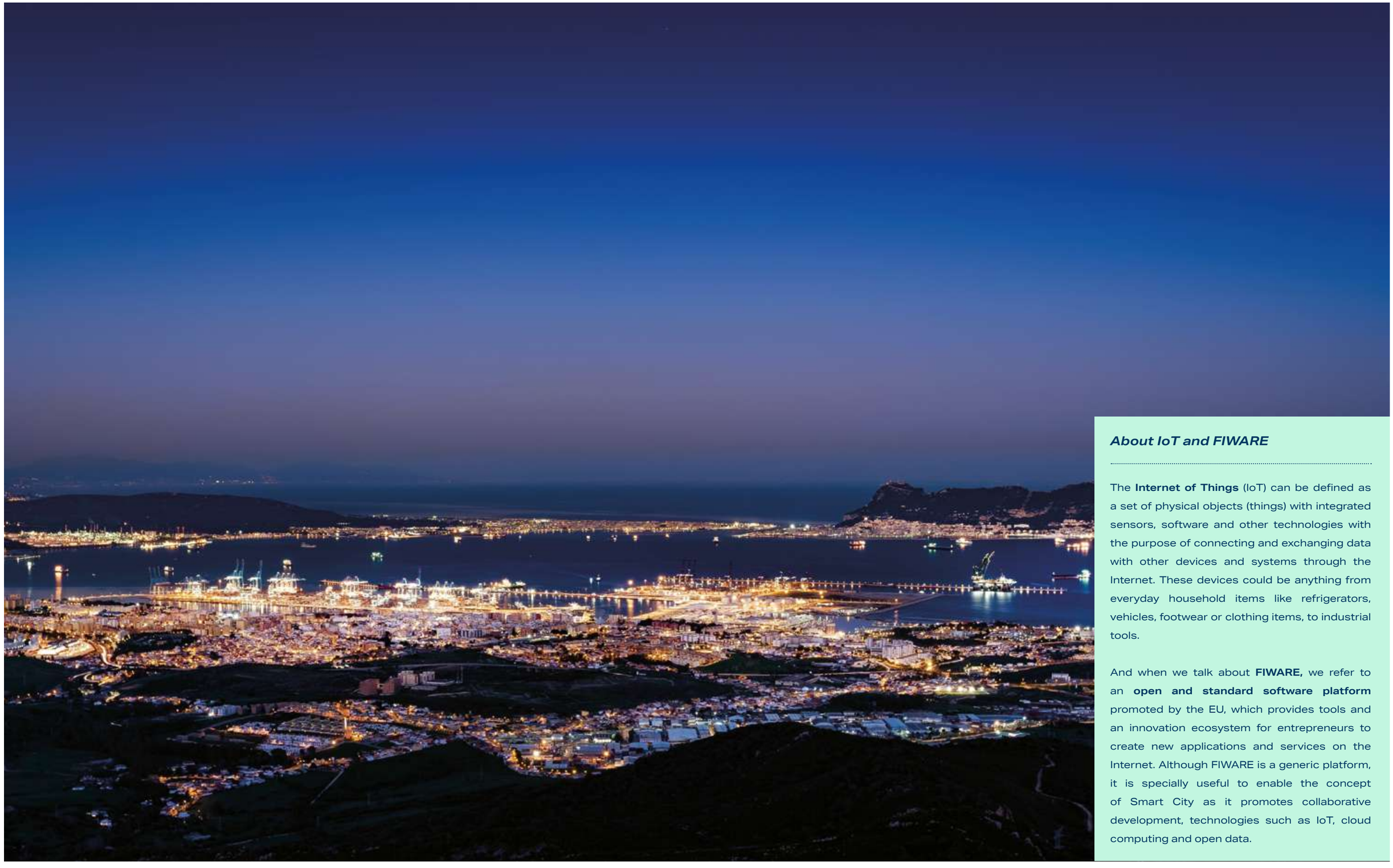
The challenge proposed by APBA was awarded the last edition of the **FIWARE Zone IoT Challenge.**

Their challenge, entitled **"Advanced platform for environmental management and sustainability in the Port of Algeciras",** was focused on finding allies and innovative technology solutions to obtain real-time data about the surrounding environmental factors (e.g. air and water quality, and noise, light and odour pollution), and to detect logistic issues within the port area and in their immediate vicinity.

FIWARE Zone is an initiative launched jointly by the Department of Economy, Knowledge, Businesses and Universities within the regional Council of Andalucía, and Telefónica. It is focused on **supporting and promoting digital transformation of companies, using technologies such as IoT, Big Data and Artificial Intelligence with FIWARE Zone as a linking thread**. **IoT Challenge 2020** is one of its anchors, which enables, through challenges posted by sponsors, the development of projects applied to strategic settings and based on real issues. In particular, this edition aimed for companies to provide FIWARE technology solutions to challenges experienced by the public sector in any of the following areas: smart cities, smart ports, smart logistics, Industry 4.0, Smart Agrifood and e-Health.

In September, that is, at the time of completion of the deadline to submit proposals, a jury assesses all the applications, and **9 companies were short-listed: Hiades, HOP Ubiquitous, IoT Algeciras, ProDevelop, Purple Blob, SeaPort Solutions, Secmotic, Softcrits and Telprosur.** Later, an assessment committee integrated by members of the regional Council of Andalucía, Telefónica and APBA, selected **HOP Ubiquitous as the winner.** This decision was formalised in a ceremony held in Málaga, within the framework of GreenCities 11th Urban Intelligence and Sustainability Forum.

The regional Council of Andalucía and Telefónica will provide the winner with an amount of up to 100,000 euros to develop their proposed solution. Additionally, the solution will be implemented in the Port of Algeciras and integrated in FIWARE, and the data generated from it will be made visible via the Smart Specialisation Platform for Regions. APBA will have access to the IoT platform and to said data, and hence will be able to use and test the results given by the solution for a year and for free. ›



About IoT and FIWARE

The **Internet of Things** (IoT) can be defined as a set of physical objects (things) with integrated sensors, software and other technologies with the purpose of connecting and exchanging data with other devices and systems through the Internet. These devices could be anything from everyday household items like refrigerators, vehicles, footwear or clothing items, to industrial tools.

And when we talk about **FIWARE,** we refer to an **open and standard software platform** promoted by the EU, which provides tools and an innovation ecosystem for entrepreneurs to create new applications and services on the Internet. Although FIWARE is a generic platform, it is specially useful to enable the concept of Smart City as it promotes collaborative development, technologies such as IoT, cloud computing and open data.

07.

Our innovation awards

// APBA announces the 2nd edition of the "Innovation Journey" Awards.

APBA awarded the **prizes of the 2nd edition of the "Innovation Journey"** in a live-streamed ceremony led by Gerardo Landaluce.

In his capacity as the Chairman of APBA, he welcomed the audience together with José Luis Hormaechea, General Manager, and Francisco de los Santos, Head of the Technology Development Area, and he also emphasized the importance of this type of initiatives when it comes to becoming aware and acknowledging the existing capabilities and talent in the region in particular, and in Andalucía in general.

He also insisted on **these ideas and proposals being ultimately transformed and materialised into specific projects.** In this sense, he made special mention of Lago Marítimo strategic project, which is not only a project for the planning of spaces in the port area, but also a key initiative to understand the objectives that the port of Algeciras seeks to achieve in the future - a cutting-edge, technologically-advanced, sustainable port in which innovation is a systematic and integrated component. The ultimate goal is to continue to be a competitive port and to add value for its users and customers.

Similarly, José Luis Hormaechea stressed the fact that APBA will increasingly prioritise one of their innovation cores, that is, **environmental sustainability and energy efficiency**, leading several initiatives inspired by the European Green Deal paradigm.

Next, Francisco de los Santos thanked the consistent support received from the departments lead by the afore-mentioned Chairman and General Manager, as an essential aspect to lay the foundations and taking steps ahead in the digital transformation and innovation of the port, to enhance its competitiveness and environmental sustainability. He also stated that APBA regards innovation with an attitude ›

of self-criticism and ongoing improvement in order to generate wealth for its customers and the region.

Later, an **inspiring talk** by Ander Pomposo (Head of Open Innovation and Entrepreneurship at IDOM) followed. He pointed out the need to hybridise current organisational practices with more agile and dynamic ones, with the view to increasing the quality and speed when developing new products and services, and at the same time, to promote motivation and productivity in the teams. This would make it possible to better handle priority changes for users/customers and improve their degree of satisfaction (for they are a core element). He also mentioned how relevant it is to tend to simplicity, technical excellence, self-managed teams and fast adaptation to changing times. That is to say, **renew or die in the digital age.**

Shortly after, members of the Technical Innovation Office screened a video-summary about the key milestones of the contest, which in this 2nd edition sought to acknowledge **creativity, talent and provision of innovative ideas and initiatives,** not only by employees, but also by anybody involved in the port innovation ecosystem who would like to join the initiative proposing solutions to the various challenges. These challenges were the following:

1. Improving the experience of passengers and carriers in the Port of Algeciras.
2. New models of business based on data analytics, use of connected devices (IoT) and collaboration platforms in pursuit of operational excellence.
3. Progressive de-carbonisation of the Port of Algeciras and reduction of the environmental impact in the port and the city.
4. Transforming day-to-day work in APBA.

In total, **36 proposed solutions were received from 21 members from the all the 6 APBA departments and from 8 collaborating companies and/or start-ups. 17 of the latter had successfully gone through the assessment process,** by means of which the strategic adjustment of their ideas, their expected impact at a social and economic level, their technical feasibility and their degree of novelty were, among other features, taken into account. **6 proposed solutions** were finally short-listed:

1. "Vision Row" (Juanjo Aguilar, APBA), proposing the implementation of a platform that allows carriers to know in real time operations occurring at the gates of terminals and the level of congestion in the entrance roads, by installing multiple video cameras in strategic points of the port.

2. "Excellence and competitiveness in the Strait". (Jesús Medina, APBA), whose aim consists of using AIS data to monitor the traffic circumstances in neighbouring ports (i.e. Gibraltar and Tangier) in order to detect whether there is anything they may fall short of, in pursuit of an ongoing improvement of the Port of Algeciras.

3. "Electricity production by transit of vehicles". (Jesús Matute, APBA), with the view to replacing the existing speed bumps by other ones that have built-in electricity piezometres.

4. "Renewable Plant within the Port" .
(Carlos Rodríguez, Solum), which proposes to install 100% accessible solar ground in certain areas of the port to turn its open spaces into small renew able energy production sites.

5. "En-route boarding pass" (Francisco Pardo, AddOcean), aiming to make the most of integrating APBA and shipping companies' systems to enable passengers to generate their boarding passes through a mobile app while they are travelling towards Algeciras.

6. "Data-based Smart Mobility" (Jaime Martel, ITelligent), proposes the development of an application for mobile devices that offers recommendations to simplify the customers and users' movements inside the port.

Once these short-listed ideas were presented, the awards ceremony started, during which the winners were appointed. Firstly, and as a novelty, a **prize was awarded to the idea that had been chosen through public vote** on APBA's website, for which over 200 votes were registered.

For this edition, the most popular idea was Jesús Matute's **"RFID Folders"**. Secondly, the prize to the best external idea, was awarded to Paco Pardo's **"En-route boarding pass"**. Thirdly, the **award for the best idea within APBA** went to Juanjo Aguilar's **"Vision Row".**

Finally, Jesús Medina **closed the event by thanking both employees and external collaborators for the participation,** and by highlighting what he considered the 3 Innovation Journey key points - consistent support from management, strategic alignment of initiatives launched, and integration of innovation to anchor business success. ■

08.

Main conferences and events

// The Port of Algeciras takes part in the Smart Port Conference organised by Telefónica at The Cube in Sevilla.

APBA attended the **Smart Port Conference** organised by Telefónica in February 2020 at the crowd-working space **The Cube**, located in the Cartuja Science and Technology Park in Sevilla.

Over the course of the conference, in addition to being informed about the most advanced solutions offered by Telefónica in relation to smart and connected ports, APBA's delegated team had the opportunity to learn at first-hand about their technology start-up accelerator and customised working method to mentor and monitor entrepreneurs within The Cube.

APBA was also given the opportunity to learn about some of their current start-ups, some of which have innovative solutions that could be applied to port logistics. To make the most of their visit, APBA also took part in the forum **"Smart Ports: Driving forces for sustainability, well-being and economic growth in Andalucía".** It was organised by Joly Group and it brought together most of the port and technology industry stakeholders in the region, with the aim to inform them about the latest technology, innovation and sustainability-related upgrades for ports.

Chairmans of Algeciras (APBA), Sevilla, Cádiz, Motril and Huelva, the Director of Public Administrations and Southern Companies at Telefónica, and the regional Head of Digital Business at Telefónica attended the meeting. Project "Ports 4.0" was referred to on multiple occasions - a capital fund based on a corporate open innovation model implemented by Spanish ports to attract, support and realise the application of talent and entrepreneurship to logistics. **Gerardo Landaluce**, Chairman of APBA, mentioned said project, as well as "the major investment being made (25 million euros and other 35 million in the next few years) so that digital transformation is strengthened as an element of day-to-day operations at the Port of Algeciras."

// APBA participates in the Conference "Industry 4.0", which encourages digital transformation in the industry.

The Port of Algeciras took part in the Conference **"Industry 4.0",** organised by the Industrial Engineers' Association of Aragón and La Rioja, and the Telecommunications Engineers' Association of Aragón. It was held online on the 22nd, 23rd and 24th of September 2020.

With a predominantly practical approach, and from a business efficiency perspective, **the event was focused on conveying what "Industry 4.0" means,** on examining the various technical subsystems it encompasses and, most importantly, on raising awareness and motivating the attendees to reflect on its potential uses within their businesses. Therefore, the conference mainly addressed individuals in managerial and highly qualified positions, with a view to improving their business processes and means of production, both by considering technology solutions and by defining operations and planning of business strategies and positioning.

The contents of the conference were structured in units to communicate that what we call "revolution" can be seen rather as an "effective and gradual evolution" adapted to the changing needs of the business, on the basis of a consistent, stable, flexible and expandable technology foundations. Each session consisted of two theoretical and practical presentations about what Industry 4.0 is and why it is beneficial for businesses to use the technical subsystems, each of which was examined and explained with examples based on real-life experiences. Moreover, at the end of each session, the attendees were invited to talk about the topics covered.

Specifically, Jesús Medina, Head of Innovation and Digital Business Solutions at APBA, took part on their behalf during the 4th session: **"Smart data at the service of businesses - Artificial Intelligence"**. Over the course of it, Jesús Medina and Jorge Luis Cano, Director of IoT at IDOM, presented the greatly successful **pilot project** developed in the Port of Algeciras and based on **applying Machine Learning in pursuit of traceability of vehicles and goods.** ›

// APBA presents its digital solutions during the 3rd meeting of ESPO Port Business Platform.

In October 2020, **ESPO Port Business Platform's** 3rd meeting took place. It was initially scheduled by the European Sea Ports Organisation (ESPO) at their office in Brussels, and eventually held virtually due to the Covid-19 pandemic.

This event, titled **"Digital transformation and Smart Port Projects: the many phases of Port Digitisation"**, was focused on the present and future impact of digital transformation on transport and logistic industries. Its benefits for smart ports and the role of these during the digital transformation process were discussed. These matters were not to be tackled from an academic or political point of view, but from a practical one, by specifying and using examples. This would then enable the attendees to openly and informally discuss the topics covered. The secretariat at ESPO made this event possible. On this occasion, the following representatives were invited to present their strategies and success stories:

- **Marko Mykkänen,** General Director at the Port of Oulu, winning port of the 5G Innovation Award. His presentation focused on how to apply the concept of platform economy in ports.

- **Piet Opstaele,** Director of Innovation at the Port of Antwerp, who presented a summary of their Business Strategy in relation to the Digital Transformation of the Belgian port.

- **Francisco J. de los Santos Ramos,** CIO at the Port of Algeciras, who presented the latest digital solutions developed by APBA to improve logistics planning, port accessibility, traffic monitoring and Covid-19 prevention.

ESPO Port Business Platform aims to bring together port strategy managers and professionals to discuss and exchange trends, challenges, strategies and improved specific practices.

// APBA presents their digital transformation-related breakthroughs to improve logistic operations in a webinar organised by Logistop.

Jesús Medina and Enrique Martín, as members of the Technological Development Area and the Technical Innovation Office and on behalf of APBA, joined the webinar **"Industry 4.0 experience-based examples of use in port logistics".** It was organised by the technology platform **Logistop**, whose initiative **Pit Stop Port Operations** they took the opportunity to introduce. Its clear objective is to **optimise port call operations through digital transformation, communication and analysis of relevant data.**

Ships arriving in port require the coordination of a wide range of employees (with piloting, tugging, mooring, loading and unloading roles, among others). Lack of coordination may bring about significant delays. From Jesús Medina's point of view, "on a global scale, this disarrangement causes 50% of ships to experience 12-hour delays, which turns into 24-hour delays for up to 30% of ships". He also pointed out that it results in increased costs for shipping companies and port pollution, i.e. ships arriving in port at full speed and finding out some port services are unavailable.

APBA has been working for years on the project Pit Stop Port Operations, whose goal is to optimise port calls by coordinating the operations involved through digital transformation. Some of the main achievements at APBA in recent years are their commitment in 2017 to **Taskforce Port Call Optimisation.** This working group includes other members such as Shell, Maersk, MSC, CMA CGM and the ports of Busan, Gothenburg, Houston, Rotterdam, Singapore and Ningbo-Zhoushan, among others.

They are working together to create a set of international standards that will allow **to unify criteria, improve communication among ports, achieve safer and more reliable processes and optimise port operations.** APBA had already launched, back in 2017, a proof of concept with digitally-shared information. Since then, they have continued to develop it to produce performance indicators, put recommendations into practice and make real-time decisions, to ultimately optimise port call processes

// The Port of Algeciras stars in the 6th Virtual Meeting organised by "El Estrecho Digital".

Jesús Medina, Head of Innovation and Digital Business Solutions at APBA, attended the 6th edition of **Virtual Meetings** organised by **"El Estrecho Digital" (EED),** local daily newspaper specialising in port and logistics-related information within the port community of Algeciras.

One of the main topics discussed during the meeting was the **ESPO Award 2020** recently granted to the Port of Algeciras by the European Sea Ports Organisation (ESPO), in acknowledgement of its innovation management and culture programme **Innovation Journey.** Medina stated that "the Port Community has several needs to cover, and it is for this purpose that Innovation Journey has been created". "We endeavour to make the most of the resources available", he added, and then confirmed that "we work with any company willing to take risks in order to innovate". **"Our success lies in considering innovation an essential factor when it comes to finding solutions for business challenges",** he said.

He reckons that the award has made possible "to appreciate that the Port of Algeciras is qualified at a technology and innovation level, despite and due to having competed with other strongly-prepared ports."

For APBA, "the key of all this was, some time ago, our determination to work hard", specially since the **Algeciras BrainPort** programme was initiated, which, according to Medina, "is the origin of the award". He concluded assuring that "operational and functional needs and challenges of the Port of Algeciras will be solved through innovation".

The event, coordinated and presented by Cándido Romaguera ("Cadena SER" radio station), was broadcast live and streamed through Youtube and EED social networks, so that listeners could post questions and comments directly.

// The Port of Algeciras shares its GIS experience at the Esri Spain Conference 2020.

APBA took part in the Esri Spain Conference 2020 - the most important GIS-related event of the year in Spain, which due to the Covid-19 pandemic was held virtually during October and November.

Throughout the five-week length of the event, professionals, managers and companies from a wide range of industries presented **the main GIS-related national and international projects.** Public service, transport, defence, universities, banking and environment will be, among others, topics covered.

Each week of the event was devoted to a single subject, and issues such as the following were addressed: the role of technology when it comes to ful-filling the 2030 Agenda for Sustainable Development, and the digital transformation in healthcare and public service to tackle Covid-19. Other topics were also addressed, such as the combination of GIS with other technologies, in order to implement of predictive models, digital twins, and AI projects based on spatial analytics. This new edition of the conference welcomed in **over 2,500 experts and 800 companies** who offered 300 live-streamed presentations, round tables, discussions and projects carried out by public and private entities such as Santander Bank, Mapfre, Enaire, Correos (Spanish Post Office), Cellnex Telecom, the regional Council of Galicia and the regional Healthcare Department of Madrid.

In particular, **APBA**, during the week devoted to "2030 Agenda and the Spanish Data Office", talked about the progress in recent years of their **Geographic Information System** for the Port of Algeciras and their Corporate Location Strategy, focusing on the **importance of creating a GIS culture and optimising value for the entire organisation.** In addition, they participated in the panel of experts **"Sailing towards a sustainable port"** along with representatives of Esri Spain, Prodevelop and Hiades, among others.

// Maritime Technology Cluster in Alicante - Port Innovation Ecosystems for Blue Economy.

The 1st Digital Meeting of the Maritime Technology Cluster within Alicante Futura took place in December. It was called **"Port Innovation Ecosystems for Blue Economy".** The conference was opened by Mari Carmen de España. She is Head of Public Works and Labour in the Council of Alicante, Chairman of the Development Local Agency, and Coordinator of the strategy Alicante Futura. The latter is a local strategic initiative aiming to turn Alicante into the Mediterranean Capital of Technology Industry, Digital Entrepreneurship and New Urban Economy.

During the event, Jesús Medina, Head of Innovation and Digital Business Solutions at APBA, informed about **how the Port of Algeciras uses digital transformation and innovation to tackle future challenges, and how it has achieved a strengthened culture of systematic innovation in its process of becoming a Cutting-Edge Port.**

In this sense, Medina presented APBA's Innovation Management and Culture Programme **"Innovation Journey"**, recently winner the 12th edition of prestigious **ESPO Award 2020,** which acknowledges it as the best European initiative of integration of local port-related innovative companies and entrepreneurs.

Similarly, Ramón Marrades, Director at PlaceMaking Europe and former Director of Strategy and Finance at Valencia Navy, invited the attendees to reflect on the interconnected processes of innovation-based economic development and urban transformation focused on **port-related challenges and opportunities.** During his speech, he examined, from the perspective of placemaking (planning and urban action through the region's own assets), the new opportunities resulting from innovation theories and practices to organise and develop port areas.

Finally, Pablo Sánchez Chillón, member of the Alicante Futura consulting team, addressed the details of the Maritime Technology Cluster, as an industry-based proposal for economic competitiveness of the city. This strategy arose from a coherence and integration of the local port ecosystem based on public-private collaboration, open innovation and the promotion of Alicante as a space for innovation and value-adding action toward Blue Economy.

// Prodevelop and MundoMarítimo webinar - APBA presents their Pit Stop concept and its implementation to optimise port calls.

Jesús Medina, on behalf of APBA as their Head of Innovation and Business Digital Solutions, participated in the seminar **"Optimisation of Port and Terminal Operations: A practical approach",** organised by the technology company **Prodevelop** and **MundoMarítimo** (Chilean magazine specialising in sea transport).

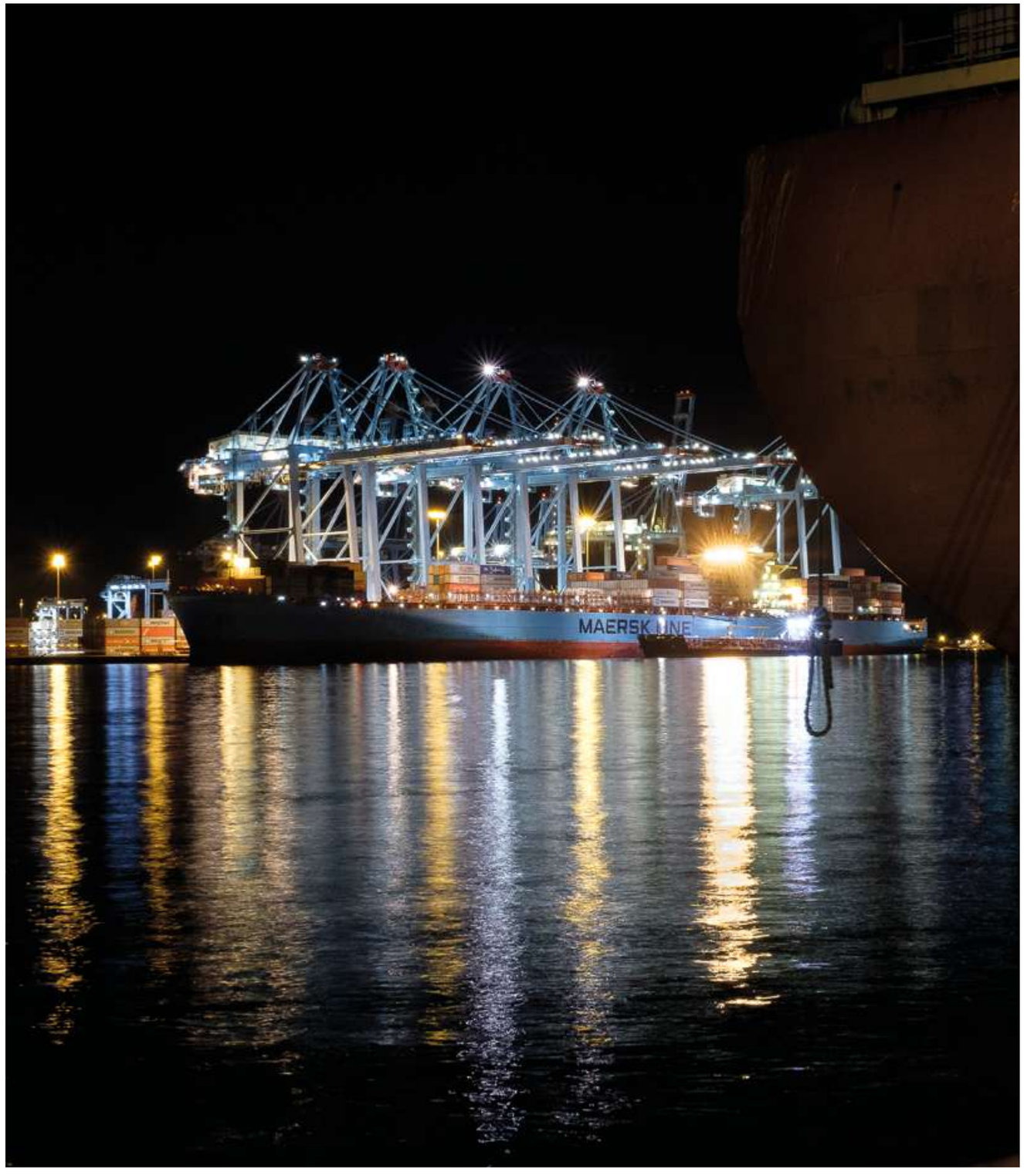
The conference was moderated by Helmut Bellingrodt, Director of International Business Development in Prodevelop, and his work colleagues Miguel Ángel Llorente, Head of Innovation and Terminals Digital Transformation, and Ángel Martínez, Project Manager. They explained how Prodevelop products can help improve the safety and profitability of port operations.

Additionally, in order to introduce a practical approach to the session through real examples of use of these tools, two experts in the industry participated - Francisco Blanquer Jaraiz (Innovation and Development Senior Manager at Terminal Link) and Jesús Medina Blanco (Business Relations and Innovation Manager at APBA).

Jesús Medina examined the issues associated to port call management, from which the concept of **Pit Stop** at the Port of Algeciras emerged. This concept, aligned with the **Port Collaborative Decision-Making** initiative, envisages all the members of the Port Community working as a team to optimise the handling of these operations.

The main steps taken by APBA to make Pit Stop possible were also talked about - they go through digitising and **automating port call operations, including the entire Port Community, and using industry standards for the effective communication of all the parties involved**. In turn, Ángel Martínez demonstrated in real time how **Posidonia PortCDM**, **promoted by APBA,** works. It is a Prodevelop tool that puts into practice the Pit Stop concept.

You can watch the seminar at the following link.

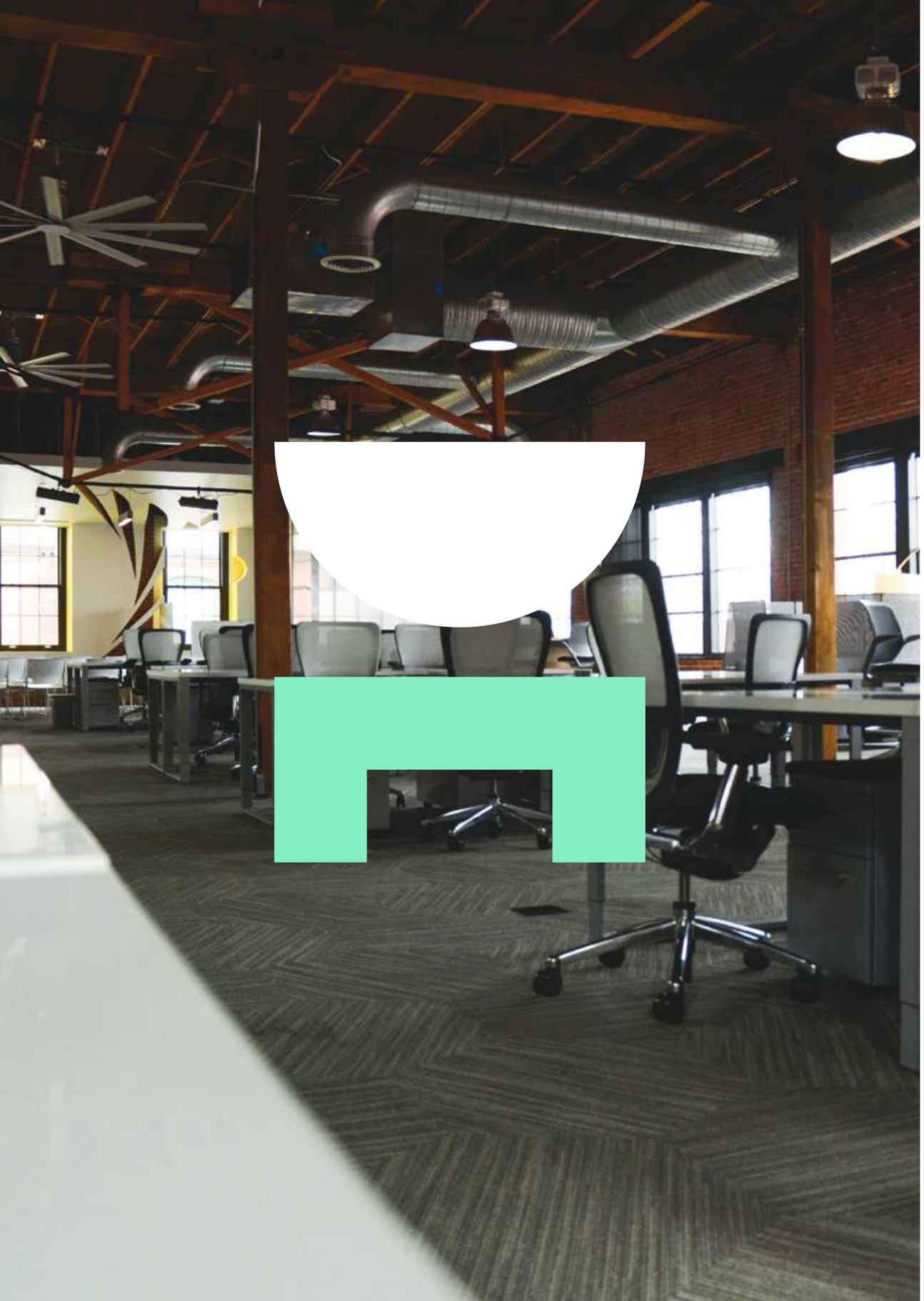


// The Port of Algeciras presents its challenges and innovation programme at the FOCOMAR Conference.

In December, the Port of Algeciras participated in the conference **"Defining the capabilities and potential of the ports of Algeciras and Cádiz"**, organised by the Innovation and Development Agency of Andalucía (IDEA) within the framework of the **FOCOMAR** Project, and held in the headquarters of the Campo de Gibraltar Chamber of Commerce in Algeciras.

The event was attended by Carlos Fenoy Rico (Chairman of the Chamber of Commerce), Fernando Casas Pascual (Managing Director of IDEA) and Gerardo Landaluce Calleja (Chairman of APBA). During the first part of the conference, which was held both face-to-face and online, the works and results obtained through FOCOMAR at the ports of Cádiz and Algeciras were presented, together with the advantages and opportunities offered by both areas to their users and customers. APBA's representative at the event was Nicolás Martínez, Head of Business Development. He talked about the potential of the ports of Algeciras and Tarifa and Jesús Medina, APBA's Head of Innovation, presented their Innovation Management and Culture Programme **"Innovation Journey".** Throughout the second part of the event, logistic innovation and Industry 4.0 were encouraged by means of a **workshop of technology challenges** with Acerinox, Cepsa, Indorama and APBA as supporting companies. APBA's Innovation Office proposed the challenge **"Advanced data analytics and operational excellence in port logistics",** focused on identifying new means to add value for port users and customers, as well as for goods through **use and profit from data** (smart and advanced analytics), in its various formats and sources.

After proposing this challenge, **APBA's innovation team maintained bilateral meetings** with 7 potential providers of a solution. Their proposals were mainly based on geolocation of vehicles and goods, simulation and optimisation of operational scenarios, and structural monitoring and guidance of vehicles, by using technologies such as Big Data, AI and IoT. ■



09.

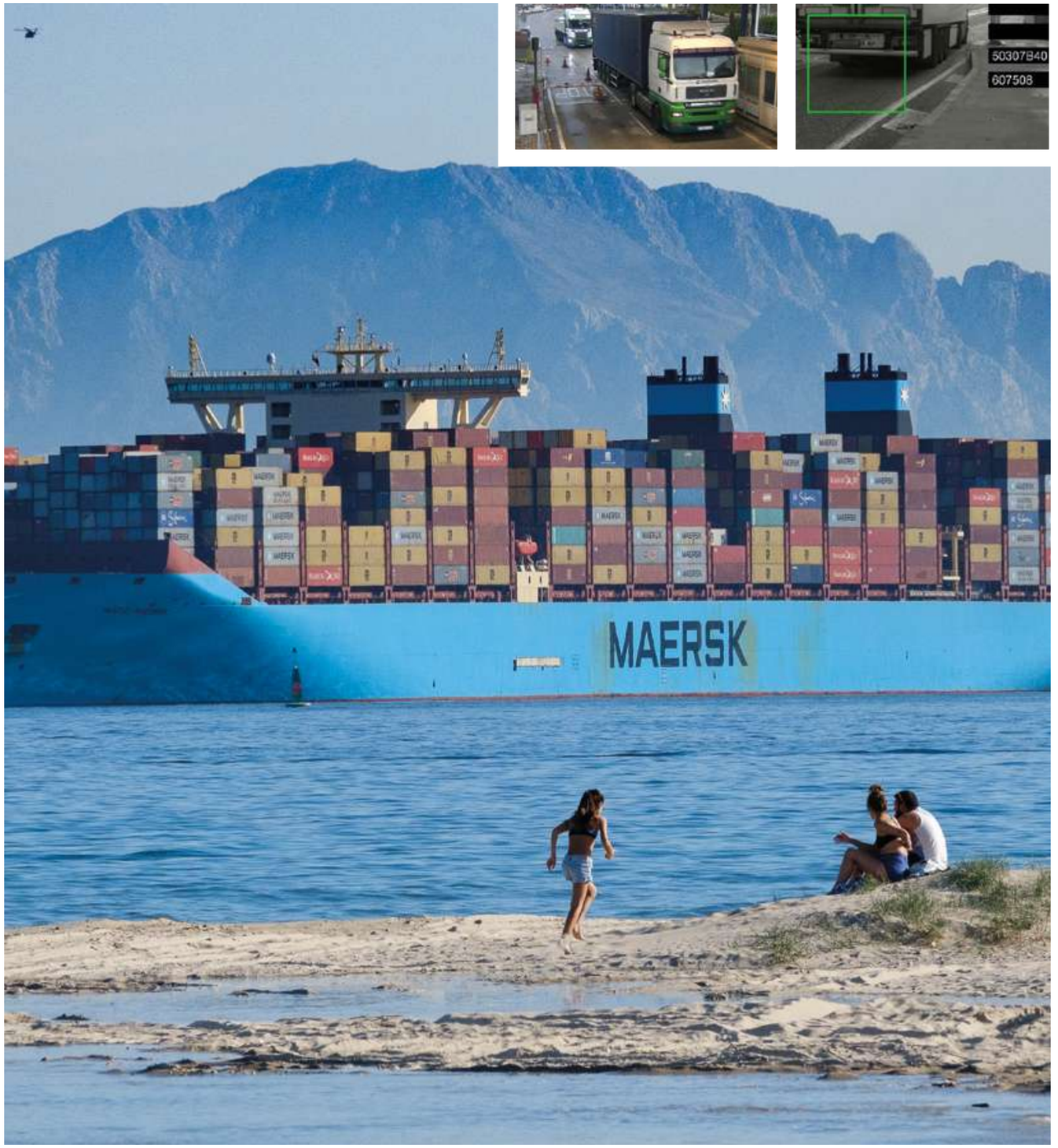
Collaboration with start-ups

// A tech-solution for vehicles traceability provided by the start-up AllRead MLT are successfully tested at the facilities of the Port of Algeciras.

APBA, within the framework of its **open innovation** programme, successfully completed a proof of concept whose challenge was to optimise the control and monitoring process for the transportation of goods within the port by using a network of cameras installed in its facilities. The challenge was successfully met by the start-up AllRead MLT, whose solution was based on **Artificial Intelligence** - in particular, on Computer Vision. Its smart reading system can read in real time any text and alphanumeric content from any image captured by any device (mobile, security camera, etc.), getting through any blur, stains and movement.

This technology, innovative and patent-registered, is based on **neural networks** and Deep Learning, so that the system can learn from its mistakes (in a similar way to the human brain) and reach rational deductions when reading codes and figures. Unlike other solutions on the market, AllRead MLT vision solution is software-based, so that it is possible to make the most of the **benefits of Deep Learning**, as opposed to traditional image-capturing devices. In fact, hardware is increasingly being regarded as a commodity, and here lies the importance of this innovative **hardware-free solution.**

Moreover, AllRead MLT solution can detect the location and type of registration numbers (container, trailer, tractor unit, etc.) included in images. It can read and understand the information they contain. These abilities set the solution apart from the traditional OCR (Optical Character Recognition), which cannot set the content in a context. The **proof of concept** has consisted of the development and implementation of a minimum viable product (MVP) to process the images taken by the existing cameras in the port and neatly



produce registration numbers of containers, platforms, trailers, semi-trailers, tractor units, and any light vehicles both of European and Moroccan origin.

The Port of Algeciras, due to its uniqueness and geographical location, receives a high number of vehicles of diverse origins and destinations - this results in a complex scenario when it comes to reading registration numbers.

// The pilots of the PortXchange platform at the Port of Algeciras show potential improvements in idle times.

The Port of Algeciras, one of the main maritime hubs worldwide and one of the main container ports in Europe, is carrying out a pilot project together with Maersk Line, APMT Algeciras, Marmedsa and PortXchange to optimise port calls and hence reduce emissions. The objective of this pilot project is to **improve port call operations holistically and promote Just-in-Time arrivals by implementing the PortXchange digital platform.**

The Port of Algeciras, located in the Strait of Gibraltar, is the 1st Spanish port and the 4th in Europe in terms of total cargo. With more than 110,000 ships per year crossing the Strait of Gibraltar and 7,500 ha of deep water, the Port of Algeciras embodies the concept of **one-stop-port** in terms of ship services (fuel supplies, repairs, ship supplies, etc.). Given the substantial number of Maersk Line port calls in Algeciras, the port was chosen as the ideal setting for the pilot project.

Communication standards.

All parties involved share a common interest in improving collaboration and making port calls more efficient. The pilot project has been running for approximately six weeks and has led to minimised idle times on departures and arrivals of Maersk ships. These results were achieved through **standardised** ›

data exchange and accurate notification of planning stages. PortXchange applies the communication standards of **Taskforce Port Call Optimisation** to ensure that everyone involved in port call operations speaks the same language.

Improved situational awareness.

PortXchange provides a data-sharing centralised point in real time with the aim to align all parties involved during port call operations. All **users have access to an overview of the entire process and are instantly informed about any time changes.** This shared knowledge helps them quickly adapt to changes and adjust plans accordingly.

Just-in-Time arrivals.

The time required for the ship to arrive at the pilot's boarding point depends on several factors, including docking spaces, pilots, and tugboats' availability, as well as sea conditions, among others. Many changes can occur 48 hours prior to their arrival in port. **Timely updates among port authorities, terminals, shipping lines and port employees during this time are crucial for port calls to be efficient.** However, when last-minute changes occur, ships usually do not have enough time to adapt to them. PortXchange aims to solve these challenges **by making updates available as soon as they take place. This way, ships can optimise their speed and reduce unnecessary emissions,** e.g. when their scheduled docking time needs to be postponed.

Synchronisation of port operations.

Francisco de los Santos, Head of Technology Development at APBA, is enthusiastic about the project: **"Synchronising port operations from a holistic perspe-ctive is key for the competitiveness of the Port of Algeciras.** Bearing in mind this objective, we apply international standards to speak the same language, and we combine advanced tools such as cloud computing, machine learning and APIs for automated, real-time data exchange and collaboration among all parties involved in port calls. Although we have our own collaboration platform, we strive to be **technology agnostics** and willing to collaborate with any platform that can add business value. This pilot project with PortXchange is a good example of collaboration and business approach - one step further for port logistics to become more data-based, transparent, efficient and sustainable".

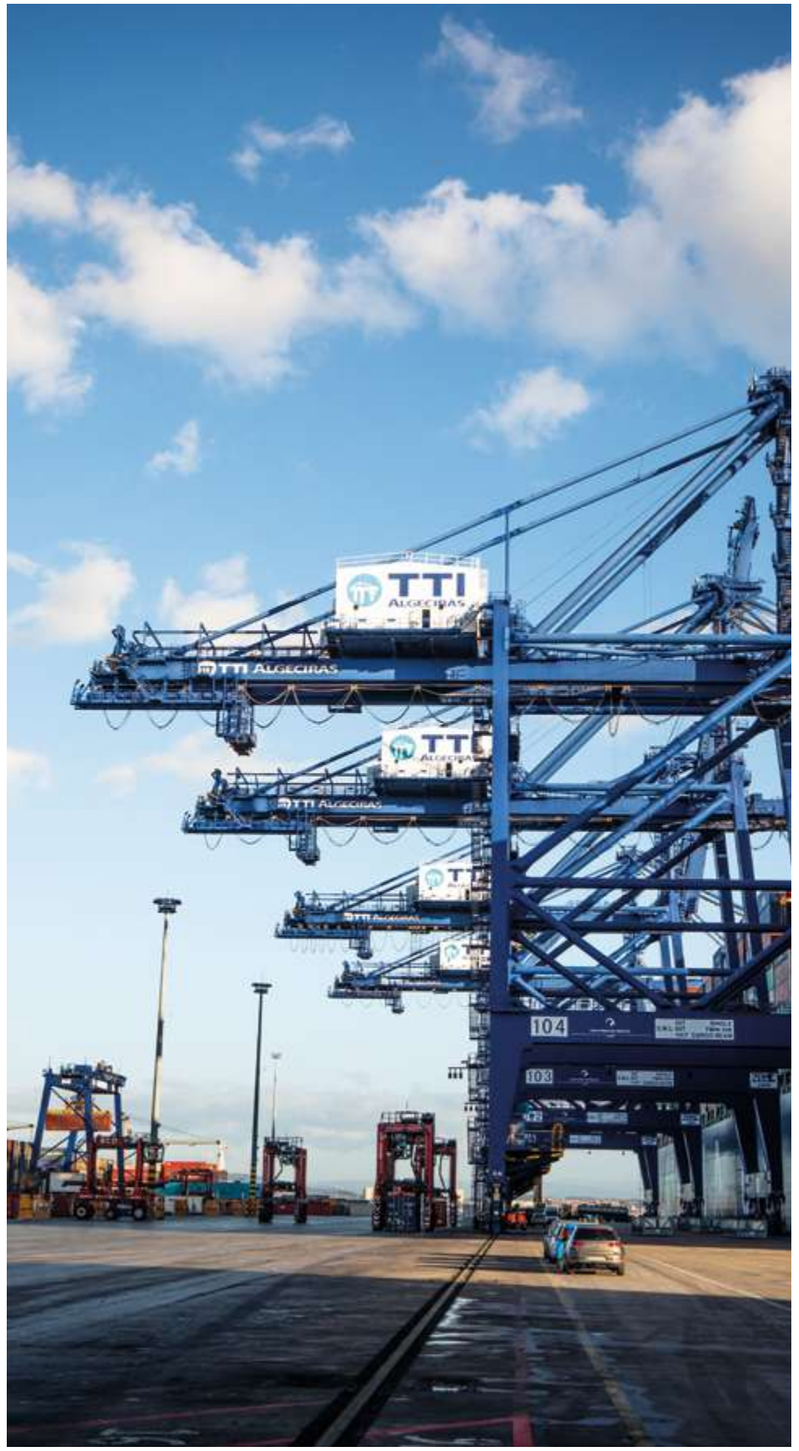
Henrik Petersen, Head of the Navy Maersk Line SEULOC, also acknowledges the potential of the pilot project: **"PortXchange offers the possibility of optimising port calls and docking changes, resulting in minimised idle times.** The fact that all parties involved use the platform maximises its value. Therefore, commitment and participation of the entire port community are essential to obtain the desired results."

// APBA brings more than 60 applicants to the 1st edition of the Ports 4.0 innovation fund call.

The deadline for submitting projects to the innovation fund **"Ports 4.0"** ended in October. It is an initiative by the 28 Spanish ports, and it is integrated in the Spanish Ministry of Transport's Innovation Plan for Transport and Infrastructures.

Under this plan to promote entrepreneurship for innovation in the port industry, Ports 4.0 will allocate 12 million euros to finance the development of technology solutions to promote entrepreneurship and innovation in said industry.

During the proposal submission period, which began in July through its public announcement in the Spanish Official State Gazette (BOE), APBA has received and assessed **64 applications,** 7 of which referring to ideas and 57 to projects, both in pre-commercial and commercial stages. As a result, the Port of Algeciras has been able to attract the interest of national and international companies and start-ups, and so to reinforce its status of international Port Living Lab. After a thorough assessment by the organisation, **48 applications** (6 ideas and 42 projects) have been chosen. **APBA is committed to actively support 24 initiatives receiving funds.**



A study has been carried out to ensure all the proposals are aligned with the innovation approach defined for the Port of Algeciras: **Port operations and logistic integration (58%), environmental sustainability and energy efficiency (16%), and port security and protection (14%).** The main technology options to develop these ideas and projects are based on Advanced Analytics, **Artificial Intelligence and Sensorisation (33%), and IoT and new-generation Communications (26%).** Lastly, the origin of proposals is predominantly national (89%, as opposed to 11% of international initiatives).

The stage of assessment and final selection of proposals begins from this moment. A deadline of 6 months is set to complete this stage, starting at the time of public announcement of the call. This means that news are to be expected during the first quarter of the new year.

// The start-up HOP Ubiquitous wins the FIWARE Zone IoT Challenge 2020 proposed by APBA.

In October, the Department of Economic Transformation, Industry, Knowledge and Universities within the regional Council of Andalucía, Telefónica and APBA announced the winner of "Fiware Zone IoT Challenge 2020" in a ceremony held in Málaga within the framework of GreenCities 11th Urban Intelligence and Sustainability Forum. The solution suggested by the technological company Hop Ubiquitous SL (HOPU) for APBA's challenge "Advanced platform for environmental sustainability management in the Port of Algeciras", was the best one according to the Jury, and its development as a pilot project will be financed by Telefónica and the regional Council of Andalucía. ›

Said start-up proposes the development of an **AI-based platform that will integrate and standardise the existing data** coming from platforms such as SAMPA or SafePort, the Copernicus programme, and the air quality measuring stations recently installed by APBA. **A hundred high-quality sensors will also be implemented** in order to measure various environmental factors, e.g. air and water quality, and odour and noise monitoring, the latter by means of sound-level metres. All these new devices will be placed everywhere within the port facilities, and the data they provide will be centralised in said platform which will display them in real time. This way, **data compilation and analysis will simplify future predictions and decisions.**

HOPU's proposed solution was chosen among **9 short-listed ones** submitted by companies such as **Hiades, IoT Algeciras, ProDevelop, Purple Blob, SeaPort Solutions, Secmotic, Softcrits and Telprosur.** APBA's challenge was selected among the 8 projects submitted for the public call for innovating technology solutions for real-time, environment-related data collection in ports, as an initiative of the regional Council of Andalucía and Telefónica.

Technology companies participating in FIWARE Zone proposed a wide range of solutions whose purpose **was the analysis of data in pursuit of informed environment-related decision-making in the Port de Algeciras**. FIWARE Zone is a joint initiative of the regional Council of Andalucía and Telefónica, whose objective is to support and promote business digital transfor-mation through technologies such as IoT (Internet of Things), Big Data and AI, by means of the FIWARE software platform as a linking thread. This platform is open, shared and supported by the EU. ■

// Radar Start-ups 2020

Radar 2020

Image & Video Processing

allread
detektia
ANYLINE
DEEP EYES
wooptix
vicomtech
BALIDEA
cogniac
vision-box

Advanced Analytics, IA&ML

Secmotic
urban clouds
Rombit
hap
INALIA
INNOVATING DIFFERENTLY
AISTECH
sigfox
ALEN
KIWANDA
PURPLE BLOB.
WiTraC
Sync

IoT/5G/NextGen Comms

CONTIAMO
PIPERLAB
FILAMENTW
ELEMENT AI
make smarter decisions
GIGASPACES
innovate with confidence
SOFTCRITS
Software for Critical Systems
SEAPort Solutions
BLUE CARGO
LUCA AI Powered Decisions
NORLEAN
SIGMA ARTIFICIAL INTELLIGENCE

Cibersecurity

Enthec.

Maritime Instrumentation

igeotest
L. STRAATMAN BV

Drones

RIGITECH
aerdron
SKYPORT SOLUTIONS
ICTYS tech

Logistics & Mobility

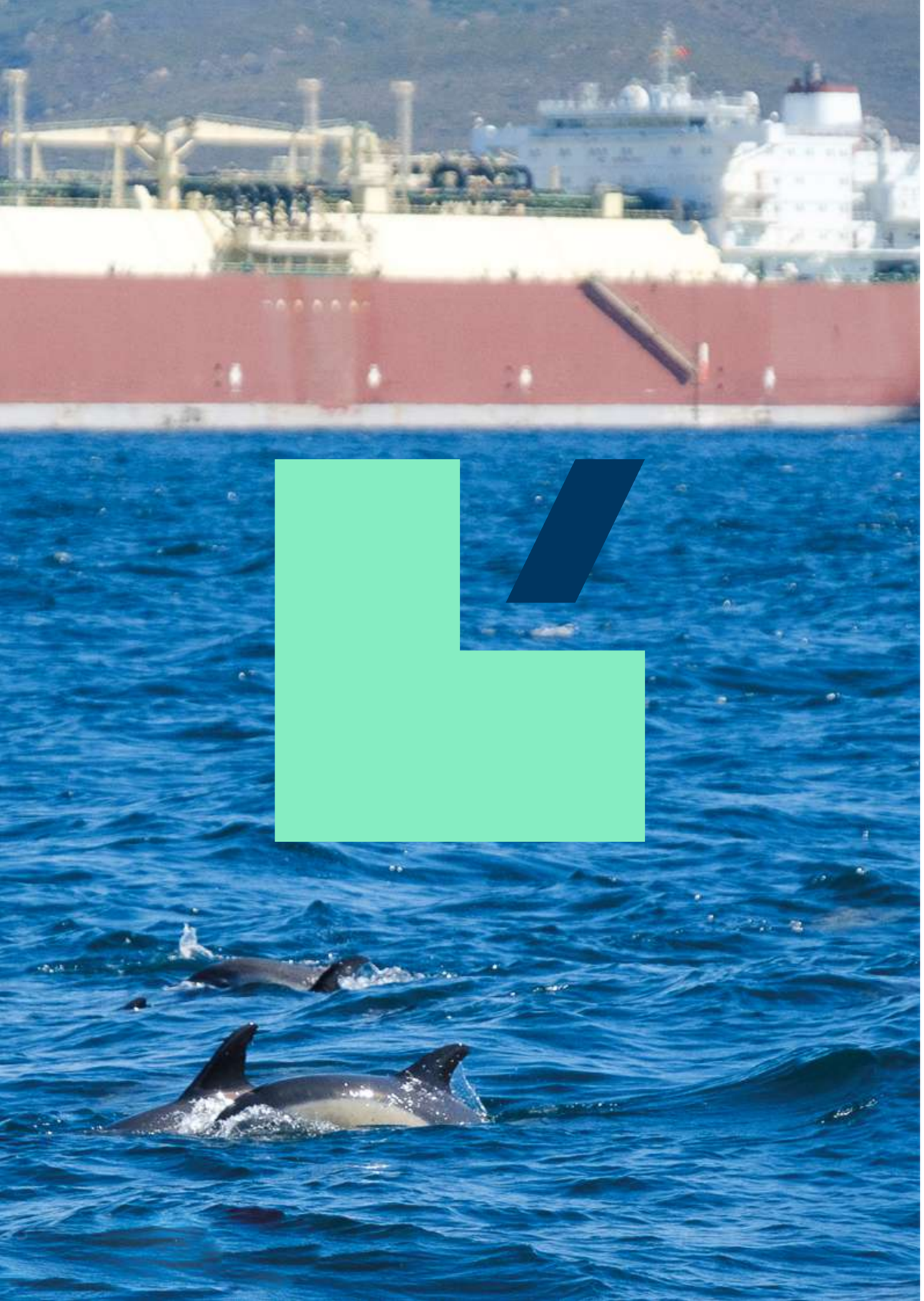
BIZCARGO
Portxchange
awake.ai
SEAPort Solutions
i4sea
SMARTESCROW
LOGINNO
BUSUP
ionob.

Energy Efficiency & Sustainability

bound4blue
SOLUM
Eco Wave Power
fundeen

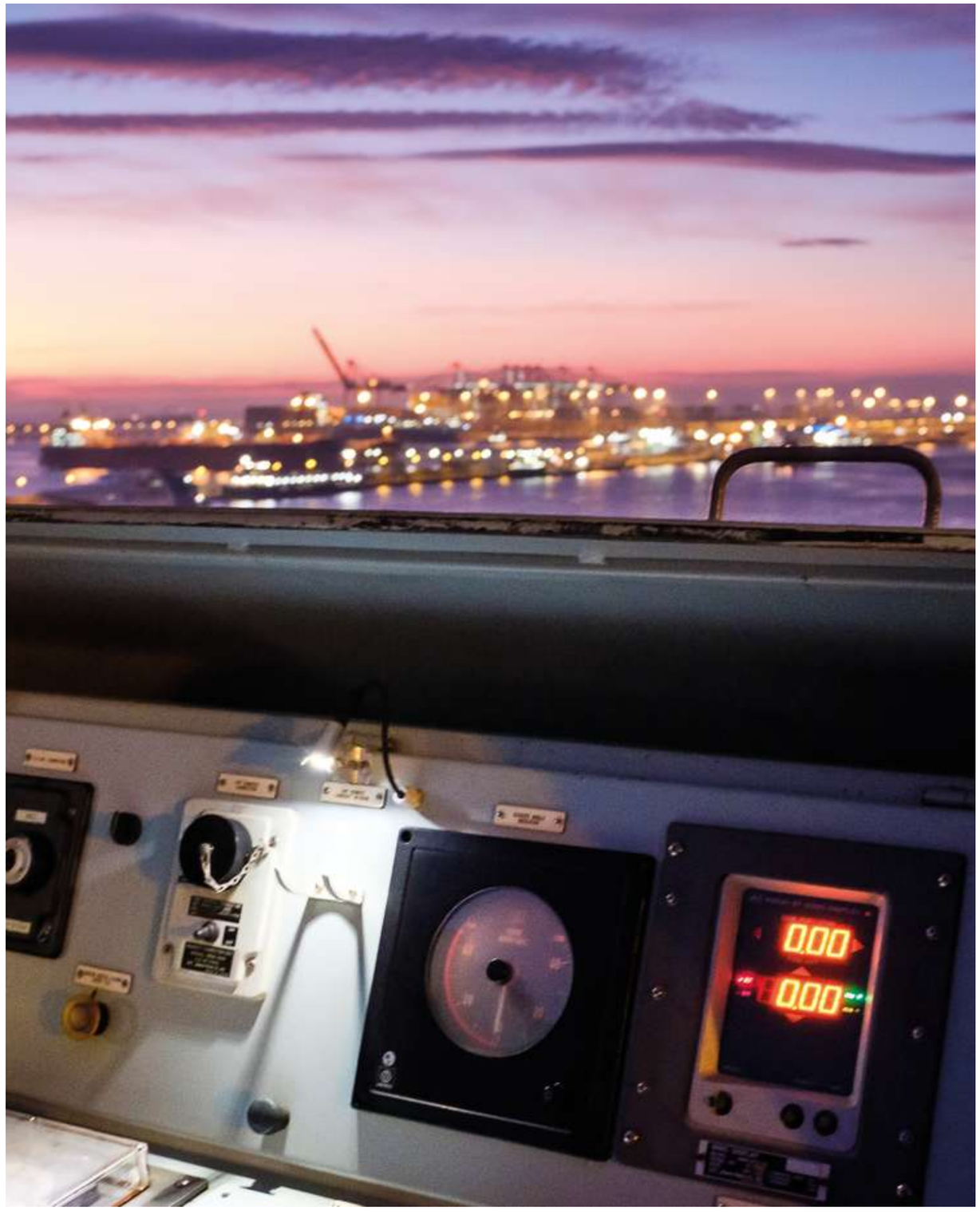
Future Transportation

ZELEROS
navlandis
CONNECTAINER



10.

Press release



T

// The new normal. Fostering innovation while maintaining profitability and safety.

You can consult the publication in the QR code on this page.

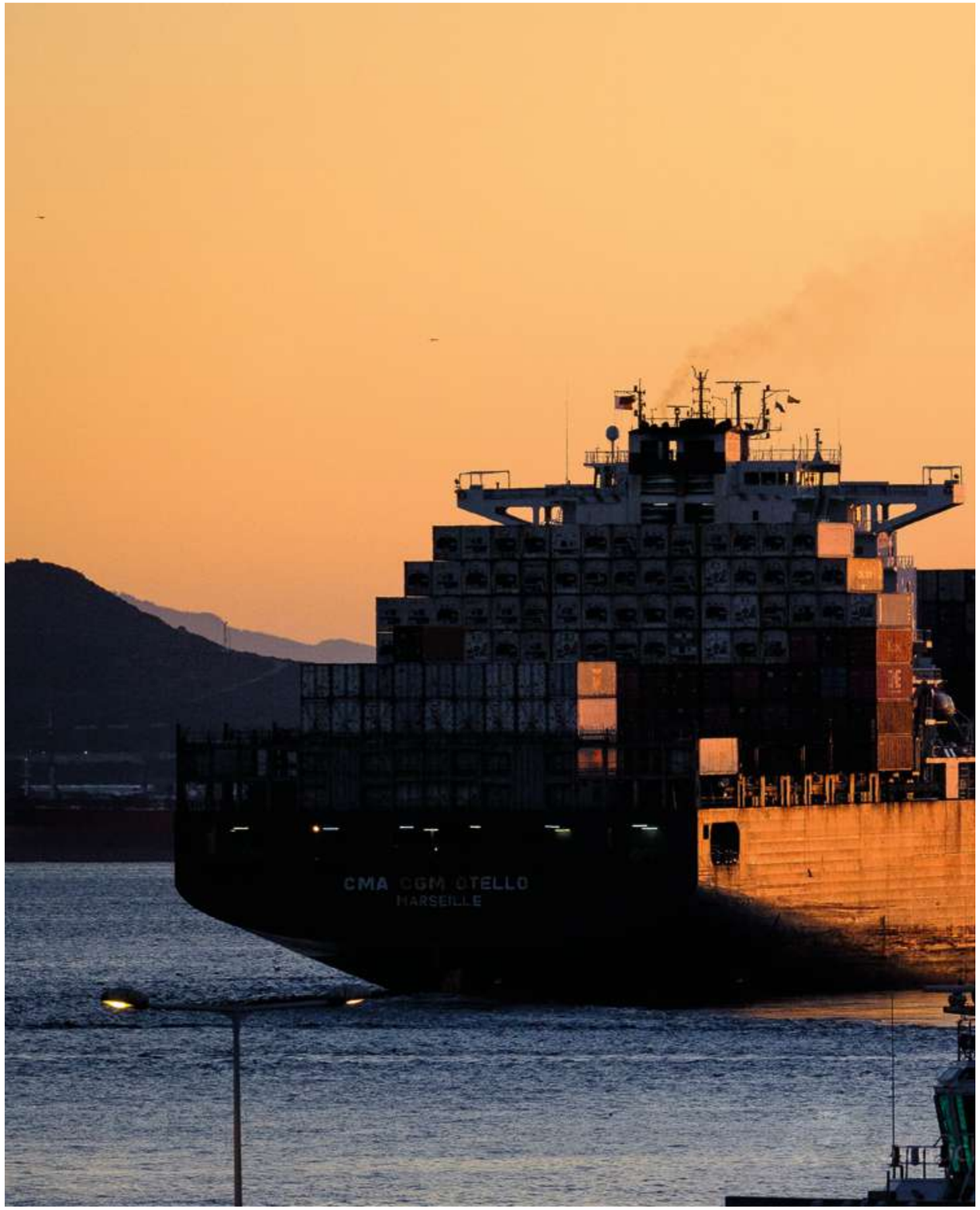
Due to the global Covid-19 pandemic, trade and sea transport worldwide have been forced to re-adapt their existing operational processes, business standards and technology tools. In this context, APBA is an example of a successful organisation - they have been able to efficiently handle the situation, and to determinedly look for innovative solutions to ensure seamless operations, reopen their economy, and carry out their functions as safely and effectively as possible.

Such is the case of the development of an innovating product in collaboration with Prodevelop, with whom APBA has been working on the Pit Stop concept. This innovative solution, Posidonia PortCDM, is based on a collaboration data platform inspired in the concept of Port CDM (Port Collaborative Decision Making) to analyse, monitor and enhance operations end-to-end. This trend was initiated by the most important ports in the world, following the same direction as the airport industry (Airport CDM).

Its purpose is to optimize Port Calls through the promotion of a common understanding and data sharing among all parties involved to improve operational coordination and to make the maritime supply chain greener due to a reduction of fuel consumption and unnecessary waiting times.

APBA and Prodevelop's collaboration is a real example that proves that it is possible to optimise and improve the port community global productivity with no need to invest in expensive and sometimes unaffordable infrastructures.

Authors: *Ángel Martínez Cavero (Product Manager at Prodevelop), Francisco de los Santos (Head of Technology Development at APBA) and Jesús Medina Blanco (Head of Innovation and Business Digital Solutions at APBA)..*



// The port of reference in Andalucía for start-ups.

Algeciras evelops open innovation projects to tackle day-to-day challenges arising from port logistics.

The Port of Algeciras continues to lead the total flow of goods in Spain and faces the pandemic with a remarkable success. Flow of goods during the third quarter of the year reached 80 million tons (only a 3.1% reduction), which makes it possible to predict that 100 million tons will be reached by the end of the year. This shows normal levels in comparison with previous years, and a minimised impact of the pandemic.

However, obtaining such results requires Algeciras to overcome constant challenges. APBA has become a space for innovation and technology where start-ups and companies take action in such a way that it has become a Silicon Valley for large-scale logistics. The goal is to attract talent in pursuit of efficiency.

To date, the port has collaborated with 50 start-ups with different degrees of involvement. This policy has turned the port into a full-scale laboratory for these companies to develop and commercialise their solutions. At the same time, the Port of Algeciras can tackle the challenges brought about by port logistics.

Moreover, the Port of Algeciras has just been announced as the winner of the ESPO Award 2020 thanks to its "Innovation Journey" programme. This award, granted by the European Sea Ports Organisation, acknowledges the role of APBA when it comes to promoting the inclusion of innovating companies and local entrepreneurs in the port industry. ■

You can consult the publication in the QR code on this page.

Author:
Soraya Fernández, ABC.

// Main releases of 2020.

El Estrecho Digital.

APBA, pioneer in achieving the 166002 certification for its RDI Management System.

10 años cadena de suministro

The Port of Algeciras wins the ESPO 2020 award.

EuropaSur

The Port of Algeciras wins the 2020 edition of the Fiware Zone.

EuropaSur

The Port of Algeciras, the Silicon Valley of port logistics.

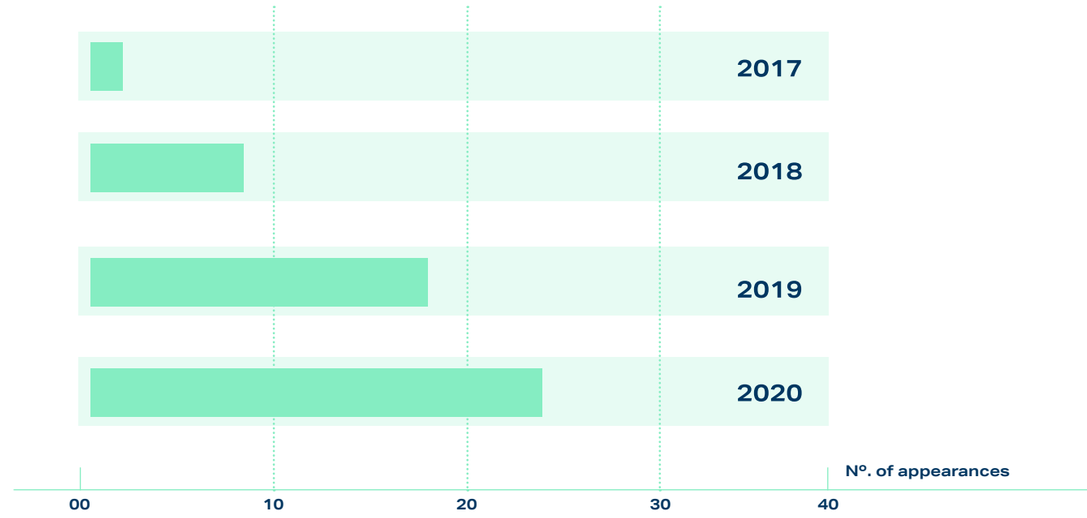
Transporte XXI

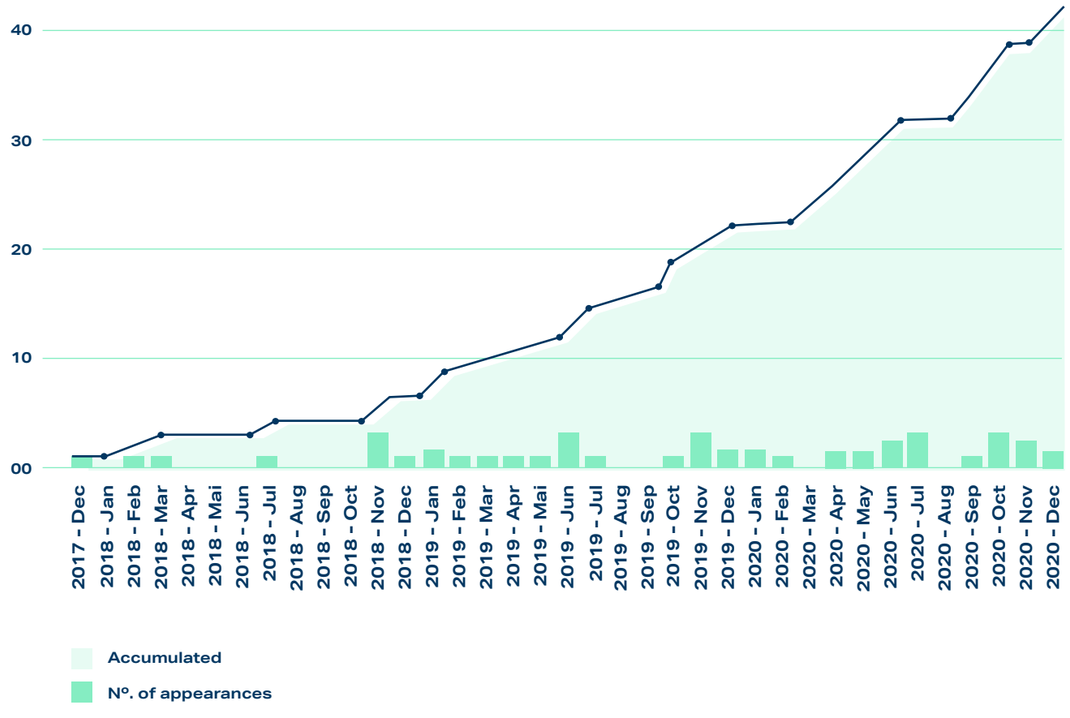
The Port of Algeciras prioritizes innovation.

el MERCANTIL

Algeciras gains efficiency in heavy traffic with artificial vision and machine learning.

// Press appearances






TTI ALGECIRAS
ZPMC
40 t
CMA CGM
ONE
A6
A5
A4