

WORKSHOP REPORT:

Breaking the surface: International interdisciplinary field workshop on
maritime robotics and applications'

2nd October 2018

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Presentation by Miriam Rueda7

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Objectives

- To promote Protoatlantic project, focused in the acceleration program in order to inform and invite startups and potential projects in the marine robotics areas to apply.
- To capture attention from stakeholders, potential participants and investors in the sector of marine robotics which is one of the areas supported in Protoatlantic.
- Serve as an event that brings together innovative marine ideas that allow the ProtoAtlantic project to be identified as the reference project in development of marine startups.
- Identify the main actors in Europe in terms of startups, research centres, entrepreneurs, companies and other innovation community members related to marine robotics in order to involve them in the creation of the marine ecosystem.

Achievements

- Protoatlantic was succesfully promoted in Biograd na Moru (Croatia) in the workshop Breaking the Surface 'International Interdisciplinary field workshop on maritime robotics and applications' on 2nd October 2018.
- The event received 38 lecturers divided in 5 different sections: marine robotics, marine biology, marine archaeology, marine security and Innovation day, in which Protoatlantic was presented by Miriam Rueda.
- More than 180 attendees from different countries and backgrounds, from research centres, universities, companies attended to the workshop.

Executive Summary

Protoatlantic was promoted by Miriam Rueda, director of Innovation at Emerge at Breaking the Surface 'International interdisciplinary field workshop on maritime robotics and applications', in Biograd na Moru (Croatia) on 2nd October 2018 during the section 'Innovation Day'.

BtS is an International workshop focused on maritime robotics and its applications, which took place from 29th September till 6th October. This event was organized by University of Zagreb, Faculty of Electrical Engineering and Computing, Laboratory for Underwater Systems and Technologies and Center for Underwater Systems and Technologies.

It is a summer workshop that encourages interaction and the exchange of knowledge and experience about the field of maritime robotics and its applications. During these days, the latest scientific research and results regarding this area were presented. Also, some field demonstrations which showcase the latest technology achievements were made by research groups and companies.

M.Rueda was invited by the organization in order to give a 40-minute keynote talk about Protoatlantic during the new session entitled 'Innovation day'. It was one of the 38 lectures that were given during this workshop. It was a great opportunity to inform and invite all startups and projects related to the marine robotic to apply for the participation in Protoatlantic Acceleration Program .

More than 180 attendees from 18 different countries were in the tenth edition of Breaking the Surface. It served as a meeting place for international experts, university professors, scientists, industry representatives and students from various fields presented the most innovative results of their projects. The topics were divided in 5 different sections:

1. Marine robotics
2. Marine biology
3. Marine archaeology
4. Marine security
5. Innovation day, in which Protoatlantic was presented by Miriam Rueda.

BTS organized 'Innovation Day', a whole day workshop where robotics experts, ranging from acclaimed researchers to the leaders of successful robotics startups, share their experience in commercializing robotics-related technologies with the rest of the scientific community and aspiring entrepreneurs. It was an excellent section in which Miriam Rueda had the opportunity to present and promote Protoatlantic, in order to encourage startups to apply to participate in the acceleration program (workshops and mentoring) and Fast Track Product Development.

M. Rueda receive a certification of appreciation for presenting the inviting lecture and taking part in an active and expert collaboration in the creation and execution of the programme.

Appendices

Agenda

The programme consisted on:

- lectures where the latest scientific research and results were presented.
- field demonstrations which showcase the latest technology achievements made by research groups and companies.
- Tutorials which offered hands-on experience working with complex and modern underwater systems
- Company presentations with insight from a company professionals about their company and company products.

The program on Tuesday 2nd October, when Innvoaiton day took place is the following.

Tuesday, 2.10.



🕒 09:00-09:45 INNOVA
The ORCA Hub: Offshore robotics for certification of assets
Yvan Petillot

🕒 09:45-10:30 INNOVA
The evolution of smart software within maritime robotics
Scott Reed

10:30-10:45
COFFEE BREAK

🕒 10:45-11:30 INNOVA
Robots in politics and business
Daniel M. Lofaro

🕒 11:30-12:15 INNOVA
Consumer robotics in the age of acceleration
Paul Oh

🕒 12:15-13:00 INNOVA
Protoatlantic – A European accelerator program of the marine sector
Miriam Rueda

13:00-14:30
LUNCH

🕒 14:30-18:30 WORKSHOP
Workshop: Defining a ROS package to standardize underwater messages
IQUA Robotics, UdG

🕒 14:30-15:00 INNOVA
IQUA Robotics
Marc Carreras

🕒 15:00-15:30 INNOVA
ecoSUB
Iain Vincent

🕒 15:30-16:00 INNOVA
Nido Robotics
Enrique González Sancho

16:00-16:15
COFFEE BREAK

🕒 16:15-16:45 INNOVA
H2O Robotics
Marin Bek

🕒 16:45-17:15 INNOVA
XOCEAN
James Ives

🕒 17:15-17:45 INNOVA
EUMarineRobots
António Sérgio Ferreira

19:30-20:30
DINNER
From 21:00
🍷 **EXCELLABUST party**

Wednesday, 3.10.



🕒 09:00-09:45 MAROB
Motion assessment of an unmanned planing craft in seaway
Aviad Avni

🕒 09:45-10:30 MARGEO
New survey visualization: Merging photogrammetric 3D model with a multibeam bathymetry
Hironobu Kan

10:30-10:45
COFFEE BREAK

🕒 10:45-11:30 MARSEC
Cyber-security solutions for unmanned systems, and their use in conjunction with new technologies to advance port security and maritime domain awareness
Philip McGillivray

🕒 11:30-12:15 MARBIO
Submarine technology for the study and conservation of deep coral gardens and cold-water coral reefs
Andrea Gori

🕒 12:15-13:00 MAROB
Oceanids: Development of next generation marine autonomous systems for ocean science
Alexander Phillips

13:00-14:30
LUNCH

🕒 14:30-15:00
Company Presentation
Blueprint Subsea

🕒 15:00-15:30 TUTORIAL
Sparus II
IQUA Robotics, UdG

15:30-16:30

DEMO Blueprint Group 1

TUTORIAL IQUA Robotics, UdG Group 2

DEMO ecoSUB Group 3

16:30-17:30

DEMO Blueprint Group 2

TUTORIAL IQUA Robotics, UdG Group 3

DEMO ecoSUB Group 1

17:30-18:30

DEMO Blueprint Group 3

TUTORIAL IQUA Robotics, UdG Group 1

DEMO ecoSUB Group 2

19:30-20:30
DINNER

Attendance list

The list of participants can be checked in the following link:
<http://bts.fer.hr/2018/09/24/bts2018-participant-list-is-here/>

Letter of invitation and Certification



LABORATORY FOR UNDERWATER
SYSTEMS AND TECHNOLOGIES

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URL <http://labust.fer.hr> / OIB (tax no.) HR-57029260362 / EU research participants portal PIC 999876486



University of Zagreb /
Faculty of Electrical Engineering and Computing

Dra. Miriam Rueda Noriega

Project Manager

Asociación Canaria de Startups,
Empresas de Base Tecnológica e
Inversores Ángeles (Emerge)

Email: mrueda@asociacionemerge.com

Zagreb, Croatia, 17/04/2018

LETTER OF INVITATION

Dear Dr Rueda Noriega,

It is our great pleasure to invite you to present your work in a format of a 40-minute keynote talk at the 10th International Interdisciplinary Field Training of Marine Robotics and Applications „Breaking the Surface 2018“, 30 September – 7 October 2018, in Biograd na Moru, Croatia. Your expertise is valuable for the scope, quality and pertinence of the BtS2018 program. We would be pleased to hear more on the topic of Protoatlantic that you are involved with.

Should you choose to accept our invitation to BtS2018, we will cover your full accommodation costs for the whole duration of BtS2018, three meals per day and social program.

This Letter of Invitation, if you choose to accept it, can be used as a proof of your commitment to present your work at BtS2018 and the Organization Committee's commitment to fund the herein detailed costs of your participation in the program.

Awaiting your prompt response we stay

Yours hopefully,

Prof.dr.sc. Zoran Vukić, *manu propria*
General Chair

Assoc. Prof.dr.sc. Nikola Mišković, *manu propria*
Program Chairman

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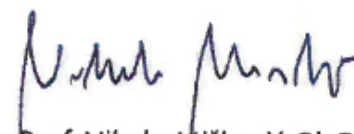
foreign gyro account :: Privredna banka Zagreb d.d. / acc.no. 702000-132344-612 / SWIFT PBZGHR2X / IBAN HR3323400091510296619

Miriam Rueda Noriega

has attended 10th International Interdisciplinary Field Training of Marine Robotics and Applications Breaking the Surface 2018 held from 30th September until 7th October 2018 in Biograd na Moru, Croatia.



Prof. Zoran Vukić, Ph.D.
General Chairman



Assoc. Prof. Nikola Mišković, Ph.D.
Chairman of the Programme Committee



Presentation by Miriam Rueda





INNOVATION IN THE MARINE ENVIRONMENT

Breaking the Surface

Miriam Rueda Noriega
Biograd na Moru, 2nd October 2018




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Agenda

Potential of the Canaries
EMERGE: Our services
EMERGE: The infrastructures
EMERGE: Our projects
PROTOATLANTIC

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POTENTIAL OF THE CANARIES






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EMERGE. SERVICES

Startups Invest

EMERGE provides different resources for researchers, entrepreneurs and startups to develop and optimize their business idea.

validation of an idea or initial product	access to investment
network of national and international mentors and experts	two collaborative spaces that foster innovation and the interaction of startups and entrepreneurs



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EMERGE. SERVICES

Companies R&D



Advice and support to identify innovative products, processes or services that improve their efficiency and competitiveness
Support open innovation and collaborate with R&D laboratories to solve challenges and problems
Access to public funds for R&D (agreements with universities, scientific and technological centres and tech partners)

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marinepark

- Created in sept 2014
- First Marine Coworking Space in Europe,
- Innovative start-ups/SME which work in local and international projects to develop solutions for the marine/maritime challenges

'We are working to create an Ecosystem around the marine sector, with a clear commitment to R&D and the design of different actions to promote startups around the sea'

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Michael Goldberg

Report about

- community,
- skills,
- supporting infrastructure
- Investment

related to the entrepreneurial ecosystem in the Canaries



3 days in order to solve a challenge related to the marine sector



50 people-10 teams to learn, to develop, to collaborate, to compete...



1st ed: Las Palmas
2nd ed: Tenerife



Image source: European Commission

"The focus on 5 innovative maritime sectors"

- Explosive growth in offshore wind farms (150,000 jobs)
- A way for wave and tidal energy
- Regulatory barriers to aquaculture
- Employment in maritime tourism is growing
- Market penetration for marine biotech products
- Tech for monitoring the environmental impact of deep-sea mining

Challenge: Insufficient investment to take maritime innovation to the market



The Canaries
Orkney
Cork
Brest
Oporto
Southampton
Casablanca

A model for prototyping
and exploitation of
innovative ideas in the
maritime/marine sector

Nov 2017 to Oct 2020

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START-UP ECOSYSTEM. KEY ELEMENTS

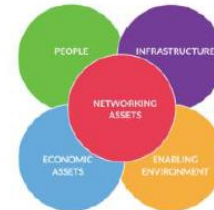


Image from The World Bank

People: Talent, diversity, creativity,...

Infrastructure: Transportation, broadband,...

Economic Assets: Industries, business and financing,...

Enabling Environment: Policies to promote innovation...

Networking Assets: community building events, skill training events, collaboration spaces, and networking of mentors,...

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STAKEHOLDERS

- Who are the key stakeholders?
- How to widen the stakeholders community?



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STAKEHOLDERS

INVESTORS
Financial return and follow up investments



ENTREPRENEURS
Seed investment, market acceleration,



CORPORATE PARTNERS
Visibility to "Open Innovation" and follow-up activity



Proto Atlantic



ACADEMY



GOVERNMENT

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SECTORS IN PROTOATLANTIC

Biotechnology



Marine robotics



Renewable energy



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SECTORS IN PROTOATLANTIC



Biotechnology

- Exploration and exploitation of the marine organisms
- Development of new products

pharmaceuticals
industrial enzymes

BIOASIS
GRAN CANARIA

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SECTORS IN PROTOATLANTIC

Technologies

- Energy converters
- Energy storage
- Electrical Interconnection Systems

5 phenomena

- Tides
- Waves
- Marine currents
- Temperature gradient
- Salinity gradient



Renewable energy

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SECTORS IN PROTOATLANTIC



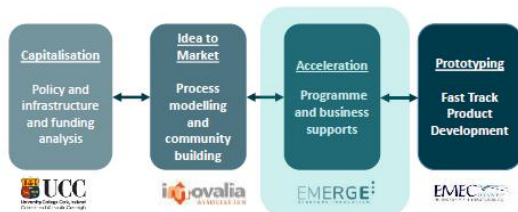
Marine robotics

- Tasks**
- Underwater inspection of infrastructures
 - Heavy work at high depth
 - Geological measurements
 - Collection ocean graphic data

- Challenges**
- Remote manoeuvrability
 - Control capabilities
 - Stability
 - Collision management
 - Size of the vehicle
 - Enhance software and hardware components
 - Underwater vision

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EXPECTED OUTCOME



- Policy makers
- Business support

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ACCELERATION PROGRAM. PARTICIPANTS

Entrepreneurs with innovative ideas/projects or technologies, mainly in:

- renewable energy
- blue robotics
- biotechnology

Potential candidates

- PhD students, postdoctoral researchers or students
- Entrepreneurs with initiatives in the maritime space or technologies applicable to this sector
- Industry and SMEs, from maritime sector



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ACCELERATION PROGRAM. APPLICATION FORM

Apply Acceleration Programme

Instructions on the required documentation to the application form.

Contact Data

First Name: _____

Last Name: _____

Email Address: _____

Phone: _____

Company: _____

Position/role: _____

Home or mobile (if applicable): _____

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ACCELERATION PROGRAM. APPLICATION FORM

Start-Up Data

Marine sector:

☐ Biotechnology

☐ Marine Robotics

☐ Marine Biotechnology

☐ Other (please specify): _____

Other (please specify): _____

Where do you see your business in the next 5 years? (Please specify the technology or product, the market, the location, the size of the business, the number of employees, etc.)

Where do you see your business in the next 5 years? (Please specify the technology or product, the market, the location, the size of the business, the number of employees, etc.)

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ACCELERATION PROGRAM. APPLICATION FORM

Protos Atlantic

WHAT IS PROTOS ATLANTIC? - PARTNERS - NEWS & EVENTS - PUBLICATIONS - CONTACT

Address

At what stage is your business/idea?

☐ Research stage
☐ Starting/early stage (R&D)
☐ Prototype
☐ Other (please specify)

If initial opinion, specify:

At what technology/technology level (TRL) is your product/idea?

☐ Basic Technology Research (TRL 1-4)
☐ Research to Proof of Feasibility (TRL 2-4)
☐ Technology Development (TRL 3-6)
☐ Technology Demonstration (TRL 5-7)
☐ System/Subsystem Development (TRL 6-8)
☐ System Test, Launch & Operations (TRL 8-9)

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ACCELERATION PROGRAM. PARTICIPANTS

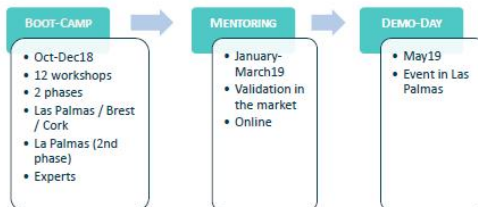
CRITERIA

1. Innovation of the technology/idea/product
2. Impact
3. Technical knowledge
4. Potential to scale internationally
5. Potential to generate employment
6. Capacity to learn in a team
7. Entrepreneur spirit



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ACCELERATION PROGRAM



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ACCELERATION PROGRAM. BOOT-CAMP

1. Business model
2. Lean start-up
3. Branding and marketing
4. Economic-financial plan
5. Lean management
6. Partnership and design team. Leadership
7. Pitch to investors



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ACCELERATION PROGRAM. BOOT-CAMP

1. BUSINESS MODEL

CONTENTS	TIME	WHO, WHERE
<ul style="list-style-type: none"> • Introduction to the business model • Types of BM • Clients. Study of the market • Channels • Model of revenues 	<p>9-18h</p> <p>Morning: Theoretical</p> <p>Afternoon: Practical case</p>	<p>30th October</p> <p>Las Palmas GC</p> <p>OSCAR VILLANUEVA</p>

TASK

Development of the Business Plan

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ACCELERATION PROGRAM. BOOT-CAMP

2. LEAN STARTUP

CONTENTS	TIME	WHO, WHERE
<ul style="list-style-type: none"> • Introduction Lean start-up • Principles of Lean startup • Development of MVP • Validation of the product • Lean startup tools 	<p>9-18h</p> <p>Morning: Theoretical</p> <p>Afternoon: Practical case</p>	<p>13th November</p> <p>Las Palmas GC</p> <p>ADRI GUERRA</p>

TASK

Validation of the idea

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ACCELERATION PROGRAM. BOOT-CAMP

3. BRANDING AND MARKETING



CONTENTS

- Brand design
- Marketing Plan
- Digital marketing
- Social Media
- Best practices in brand



TIME

9-18h
Morning: Theoretical
Afternoon: Practical case



TASK

Marketing Plan

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ACCELERATION PROGRAM. BOOT-CAMP

4. ECONOMIC AND FINANCIAL PLAN



CONTENTS

- Financial Planning Process
- Investment Planning
- Fiscal benefits in Canaries
- Building your cash basis financial model



TIME

9-18h
Morning: Theoretical
Afternoon: Practical case



TASK

Economic and Financial Plan

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ACCELERATION PROGRAM. BOOT-CAMP

5. LEAN MANAGEMENT



CONTENTS

- Core concepts of Lean management
- Lean production
- Methods of quality control



TIME

9-18h
Morning: Theoretical
Afternoon: Practical case



TASK

Method Lean in your startup



WHO, WHERE
28th November
Las Palmas GC

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ACCELERATION PROGRAM. BOOT-CAMP

6. PARTNERSHIP AND DESIGN TEAM. LEADERSHIP



CONTENTS

- Team structure.
- Team communication strategy
- Partnership Agreement
- Empowering, motivating and inspiring others



TIME

9-18h
Morning: Theoretical
Afternoon: Practical case



TASK

Partnership Agreement

ACCELERATION PROGRAM. BOOT-CAMP

7. PITCH TO INVESTORS



CONTENTS

- Tips to pitch effectively
- Different kind of pitches
- Practise your pitch



TIME

9-18h
Morning: Theoretical
Afternoon: Practical case



TASK

Prepare your Pitch

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ACCELERATION PROGRAM. MENTORING

By mentoring is referred to the process of learning and coaching provided by the accelerators to its participating startups by a group of experts, in this case, mentors, with relevant knowledge and experience in funding and managing new ventures (Yitshaki et al,).

The objectives of this process are the following:

- Refinement of the business model
- Validation of the market. Selection of the potential clients
- Preparation for investment process (make a good pitch to investors)



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ACCELERATION PROGRAM. MENTORING

Mentors will be:

- senior entrepreneurs,
- consultants of companies of professional with experience in the marine/maritime sector and in the development of business plan of innovative technological companies.



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ACCELERATION PROGRAM. DEMO-DAY



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PROTOTYPING AND TESTING

Product development in the marine environment is expensive and inherently risky. This task will utilise the expertise within the partnership to setup a product development process that runs from concept through to pre-commercial trials.

1. Prototyping:

- INESC TEC
- quickly co-design the electronic and software
- scale model of a physical part or assembly using three-dimensional computer-aided design (CAD)
- 3D printing or "additive layer manufacturing"



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PROTOTYPING AND TESTING

Product development in the marine environment is expensive and inherently risky.

2. Tank testing

UCC- Lir National Ocean Test Facility: for electrical rig testing and current and wave flume testing. Tanks for emulation of ocean waves, currents and wind.

Inesctec: Hyperbaric test until 250 bar

EMERGE: Hyperbaric test until 300bar



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PROTOTYPING AND TESTING

Product development in the marine environment is expensive and inherently risky.

3. Marine testing:

Companies will provide larger scale versions of their technologies for this trial which will be used to assess how they perform in a real sea environment. These technologies will be a step closer to commercial roll out. EMEC has the infrastructure and technical expertise to test technology in a real sea.



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PROTOTYPING AND TESTING

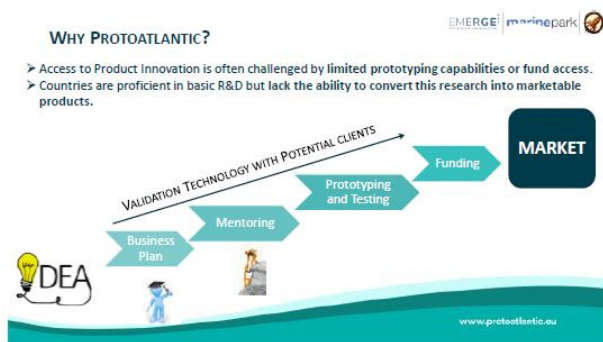
Product development in the marine environment is expensive and inherently risky.

4. Verifications:

- 6 companies that progress into the testing
- Attraction investment and guide product development.



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Photos







Lead Partner



Main Partners



**Cork
County Council**
Comhairle Contae Chorcaí



Associated Partners

