![Interreg Italy - Croatia BEAT logo with European Union flag]

BEAT

Blue Enhancement Action for Technology transfer

www.italy-croatia.eu/acronym

CROSS BOARDER DEVELOPMENT ON MARITIME/BLUE TECHNOLOGIES FOR KNOWLEDGE SHARING

The main goals of the WPT 3 of the BEAT Project relate to the identification of Ship & Boat Building Global Value Chain (GVC) and then the assessment of firms' technological offering and needs and the inter-firm relationships, with the aim to develop a cross boarder (Italy-Croatia) cluster.

The development of a cross border cluster starts with the identification of the industries related to the ship & boat building macro-sector through the framework of Global Value Chain (GVC), particularly relevant to understand how industries are organized.
In this regard, we proceeded to identify both the core industries and activities needed to bring a boat/ship from design to the final product and the support industries. As shown in in the figure 1, we estimated 18 segments comprised in four major phases: pre-production, production, post-production and support services.

Figure 1: Ship & boat building GVC
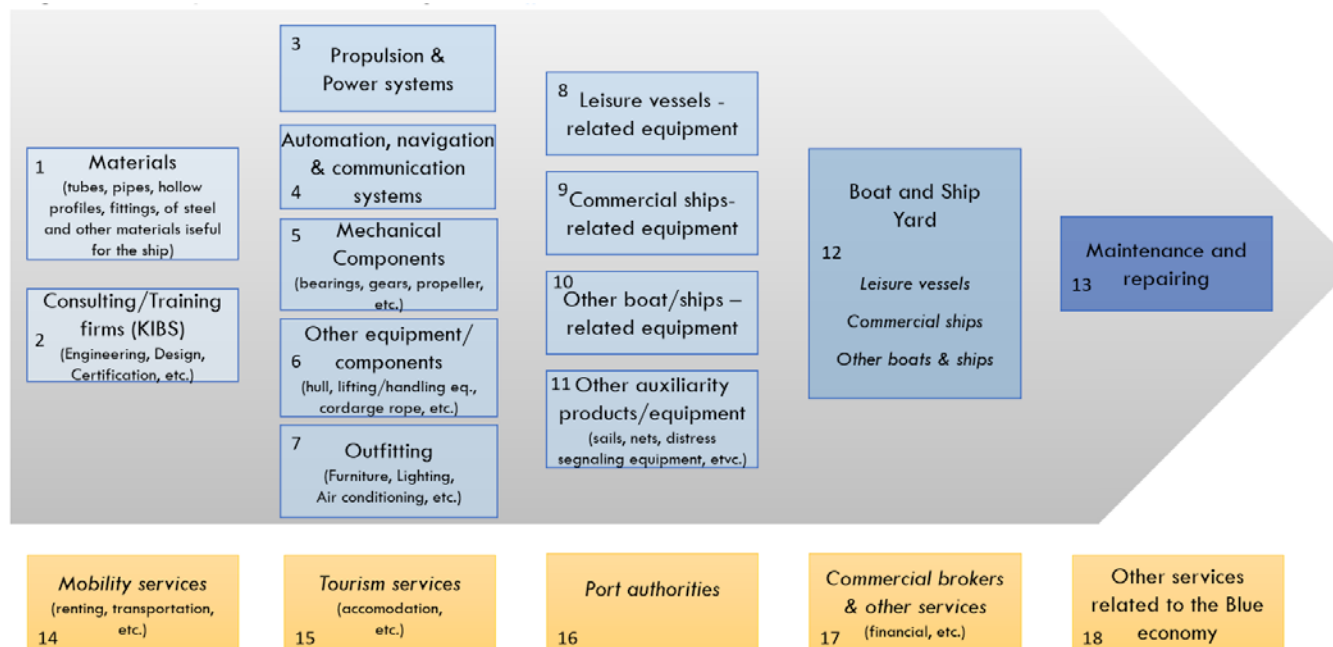
1. The pre-production activities (1-2) include the phases of design and project management, plus the production of materials and components.

2. The production phases (3-12) include the hull construction and equipment systems purchasing and integration, regarding both the structure (the hull production and the outfitting) and the 'platform' (i.e. mechanical or electronic systems/equipment).

3. The post-production activities (13) regard the maintenance and repairing services.

4. The supporting industries (14-18) include a set of services related to the mobility (renting and transportation) and tourism activities, the port authorities, the commercial and other services linked to the Blue Economy.

The assessment of the Innovation and Technological competences and needs of Italian and Croatian firms was achieved through a survey, that aimed also to evaluate the collaborations firms already have and those that they would like to activate to foster innovation capabilities and enable the development of a cross border (Italy-Croatia) cluster. Specifically, 76 questionnaires were collected, 66 from Italian firms and 13 from Croatian firms, covering all the segments of GVC. From the analysis of the questionnaires emerged the following relevant results:

- firms of all the different GVC segments aim to develop/adopt technologies that support them to improve efficiency, environmental sustainability, product-process innovation and business management;

- these technologies can be summarized in 3 main groups, as shown the table 2.

Table 2: Types of technologies need-offered

Technology group	Technologies types	% Firms aim to develop	% Firms offer
"Green" & Efficiency technologies	1. Technologies and methods for the management and production of energy and management of the on-board energy balance 2. Technologies to reduce the carbon impact of the construction and management of maritime products 3. Treatment to reduce the environmental impact of maritime transport (noise, vibration, chemical impact, recycling/reusing) 4. Automation technologies and systems for on-board systems and living areas 5. New materials and/or new applications of environmentally sustainable materials for lightening the vehicle and saving energy	79.2%	53.3%
Design and development of new products/processes	1. New approaches for design (alternative design, LCD, design for dismantling and disassembling, ecc.) 2. Definition of new concepts for products/processes/services	39.6%	42.2%
Ship management & Security	1. Technologies and systems for the security of maritime transport, infrastructure and transport systems 2. Methodologies and systems for forecasting the behaviour of the vessel under the various operating conditions, including extreme conditions	27.2%	21.1%

In particular, the results say that the most important technology advances regard the improvement of efficiency and environmental impact, with a difference (in terms of percentage) between the firms that aim to develop/adopted them and those that offer them. Instead, regard the design and development of new products/processes as the ship management and security, there is a quite balance between needs and offerings. Summarizing, it can be said that the technological advances for the firms of shipbuilding industries may be achieved or improved through the activation of collaborations between firms. Moreover, for some types of technologies, specifically "green" and efficiency techs, is important to having or activating collaborations with organizations that offer specialized services, such as Technology Transfer services (TTOs) Engineering/ICT/Marketing services, and/or universities and research centers.

This emerges also from the evaluation of the types of collaborations firms already have and with which types of organizations they would collaborate, the main areas that they aim to improve through collaborations and the main challenges of Blue Economy.

As shown in the figure 2, firms stated that they wish to collaborate mainly for the Product innovation (55.6%) and then for Marketing activities (27.8%), Process innovation (25.0%) and the Digital innovation (19.4%).

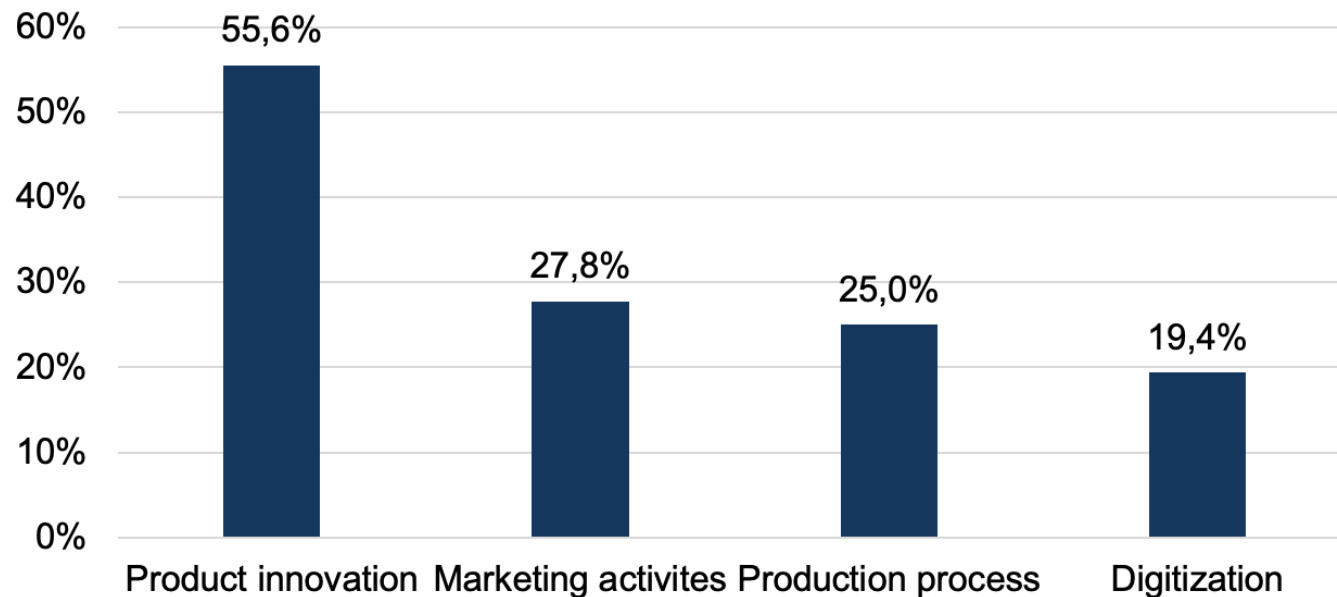*Figure 2: Business areas to develop through collaborations*

Figure 3 shows that Product and Process innovation (33.3%) linked to the aspect of Environmental sustainability (25.0%) are considered also the main challenges firms need to overcome to reach improvements in this macro-industry. Other aspects that need to being improves concern the Marketing activities (27.8%) as the Collaboration with other firms (13.9%), in the viewpoint of the entry in new markets and promote sustainability.

Figure 4: Blue Economy challenges
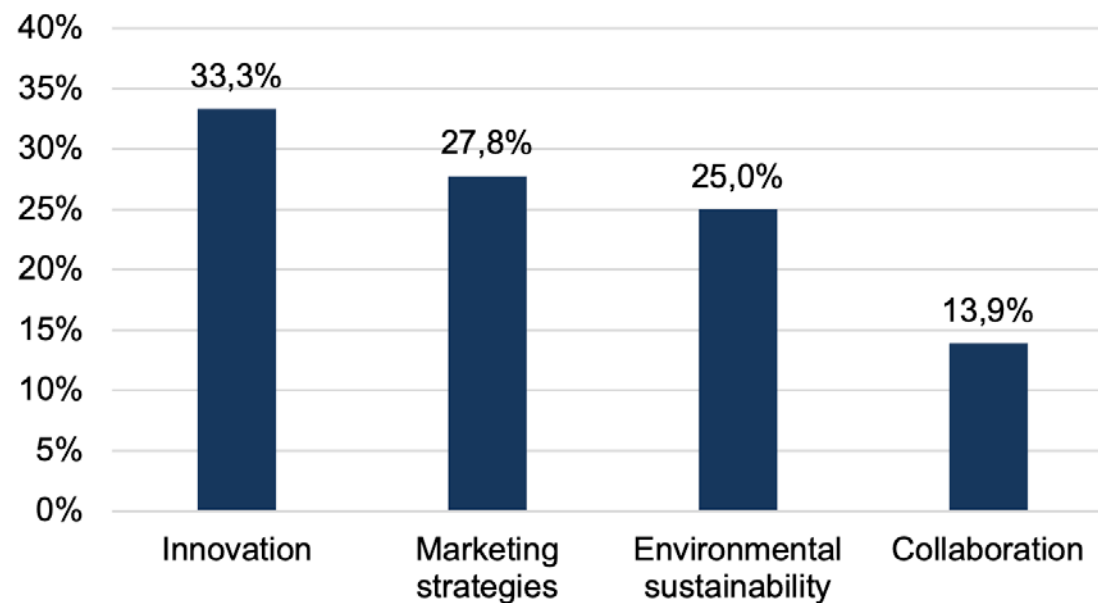
Regard the collaborations, results reported in the figure 4 show that firms collaborate principally with those actors that offer high-intensive knowledge services, in other words the so-called KIBS (knowledge intensive business services) that are Universities/Research centers (39.3%) and the consulting companies in the fields of engineering, ICT and marketing services (21.3%). On the side of the collaboration that firms would like to activate in order to foster the product and process innovation, results show that they would like to collaborate essentially with the other (big) firms (16.2%) (i.e Fincantieri).

Figure 4: Collaborations (have – would like to have) for the innovation processes
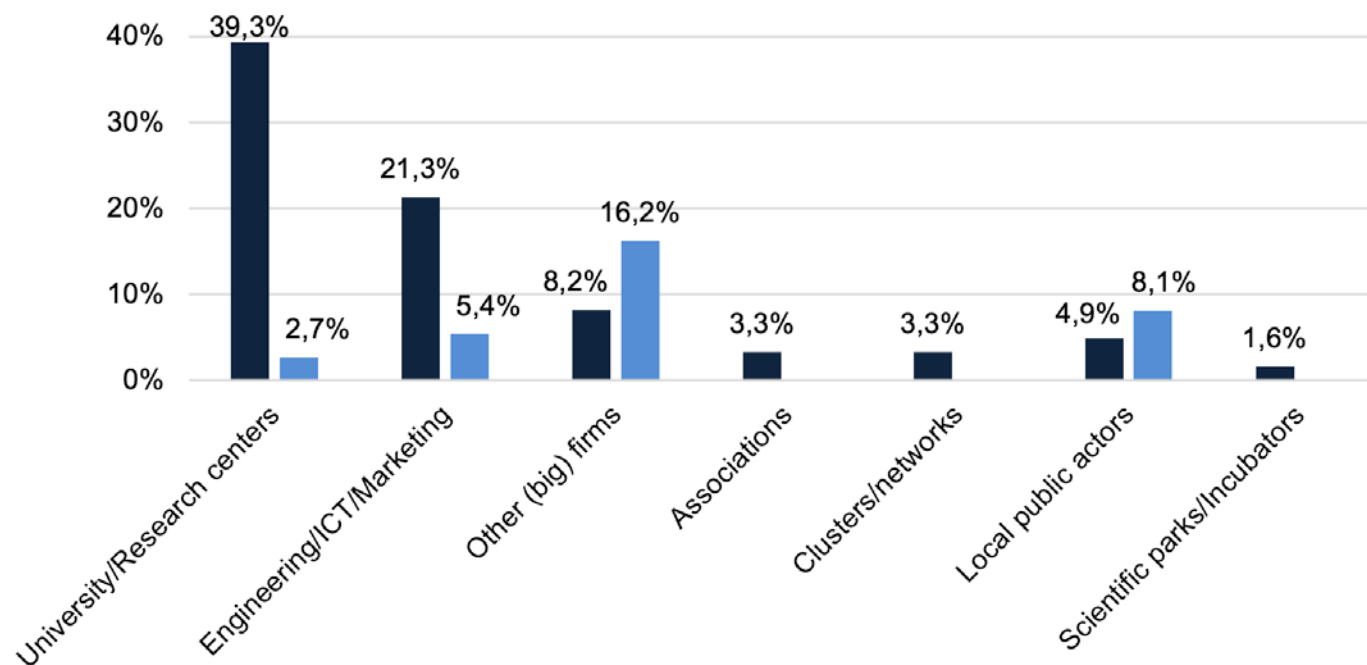
The results highlighted the key role that some types of actors – KIBS – may have in favoring the development of a relational system among the firms of the different Shipbuilding GVC sectors. Other actors, as the local public and associations, should promote the activation of inter-firm relationships, that are centrals for the development of a cluster, as they allow firms to share knowledge that improve their innovativeness capability.

INDUSTRIES OF THE SHIP & BOAT BUILDING GLOBAL VALUE CHAIN (S&B-GVC) IN THE BLUE ECONOMY

PROPULSION & POWER SYSTEM

LEISURE VESSELS - RELATED EQUIPMENT

MATERIALS
(tubes, pipes, hollow profiles, fittings, of steel and other materials useful for the ship)

AUTOMATION, NAVIGATION, & COMMUNICATION SYSTEMS

COMMERCIAL SHIPS - RELATED EQUIPMENT

BOAT & SHIP YARD

LEISURE VESSELS COMMERCIAL SHIPS OTHER BOATS & SHIPS

MAINTENANCE AND REPAIRING

MECHANICAL COMPONENTS
(bearings, gears, propeller, etc)

CONSULTING/TRAINING FIRMS (KIBS)
(engineering, design, certification, etc.)

OTHER BOAT/SHIPS - RELATED EQUIPMENT

OTHER EQUIPMENT/ COMPONENTS
(hull, lifting/handling eq., cordage rope, etc.)

OTHER AUXILIARY PRODUCTS/EQUIPMENT
(sails, nets, distress, segnaling equipment, etc.)

OUTFITTING
(furniture, lighting, air conditioning, etc.)

MOBILITY SERVICES
(renting, transportation, etc.)

TOURISM SERVICES
(accomodation, etc.)

PORT AUTHORITIES

COMMERCIAL BROKERS & OTHER SERVICES
(financial, etc.)

OTHER SERVICES RELATED TO THE BLUE ECONOMY

WHAT ARE THE TECHNOLOGICAL FRONTIERS IN THE S&B-GVC?

TECNOLOGY GROUP	SHARE OF FIRMS THAT AIM TO ADOPT THE TECHNOLOGY	SHARE OF FIRMS THAT HAVE DEVELOPED THE TECHNOLOGY
GREEN & EFFICIENCY TECHNOLOGIES	79,2%	53,3%
DESIGN AND DEVELOPMENT OF NEW PRODUCTS/PROCESSES	39,6%	42,2%
SHIP MANAGEMENT & SECURITY	27,2%	21,1%
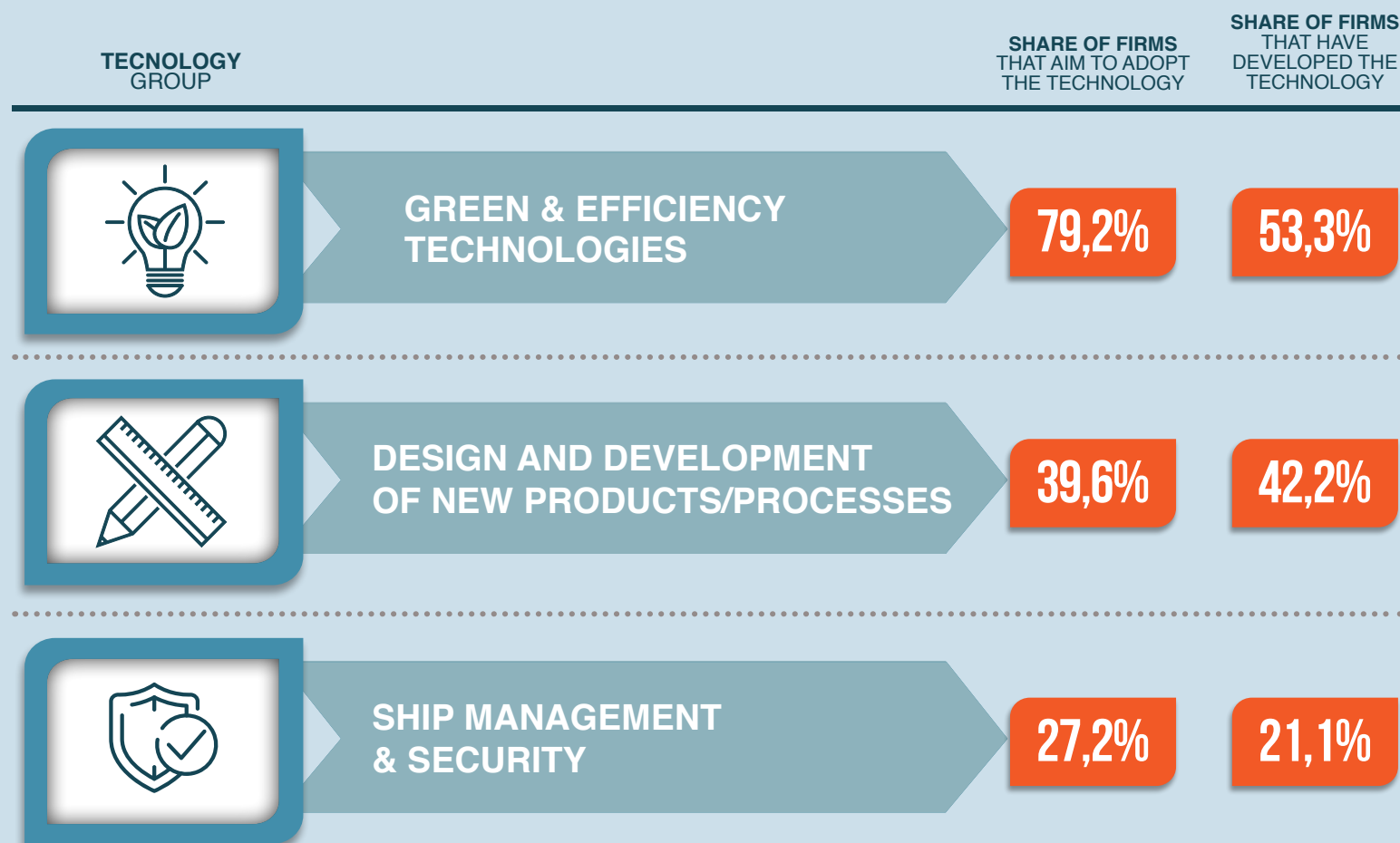
WHAT ARE THE BUSINESS AREAS THAT FIRMS AIM TO DEVELOP/IMPROVE THROUGH COLLABORATIONS?

PRODUCT INNOVATION	55,6%
MARKETING ACTIVITIES	27,8%
PRODUCTION PROCESS	25,0%
DIGITIZATION	19,4%

0%　10%　20%　30%　40%　50%　60%
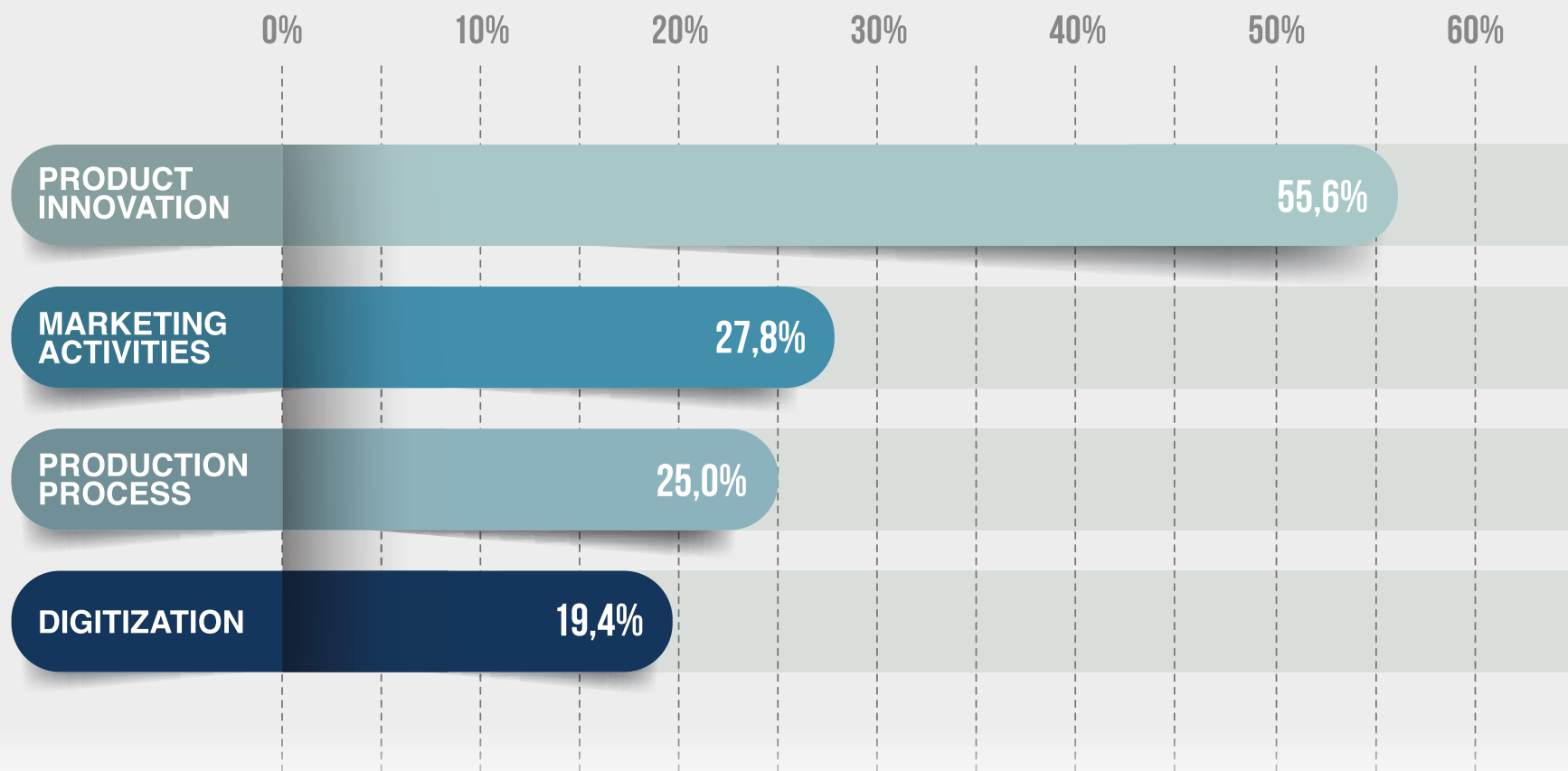
WHAT ARE THE USEFUL COLLABORATIONS FOR THE PROCESSES INNOVATION?

Collaborations that firms already HAVE

Collaborations that firms WOULD LIKE TO HAVE

| | 0% | 10% | 20% | 30% | 40% |

UNIVERSITY/RESEARCH CENTERS
- 39,3%
- 2,7%

ENGINEERING/ICT/ MARKETING
- 21,3%
- 5,4%

OTHER (BIG) FIRMS
- 8,2%
- 16,2%

ASSOCIATIONS
- 3,3%

CLUSTERS/NETWORKS
- 3,3%

LOCAL PUBLIC ACTORS
- 4,9%
- 8,1%

SCIENTIFIC PARKS/ INCUBATORS
- 1,6%
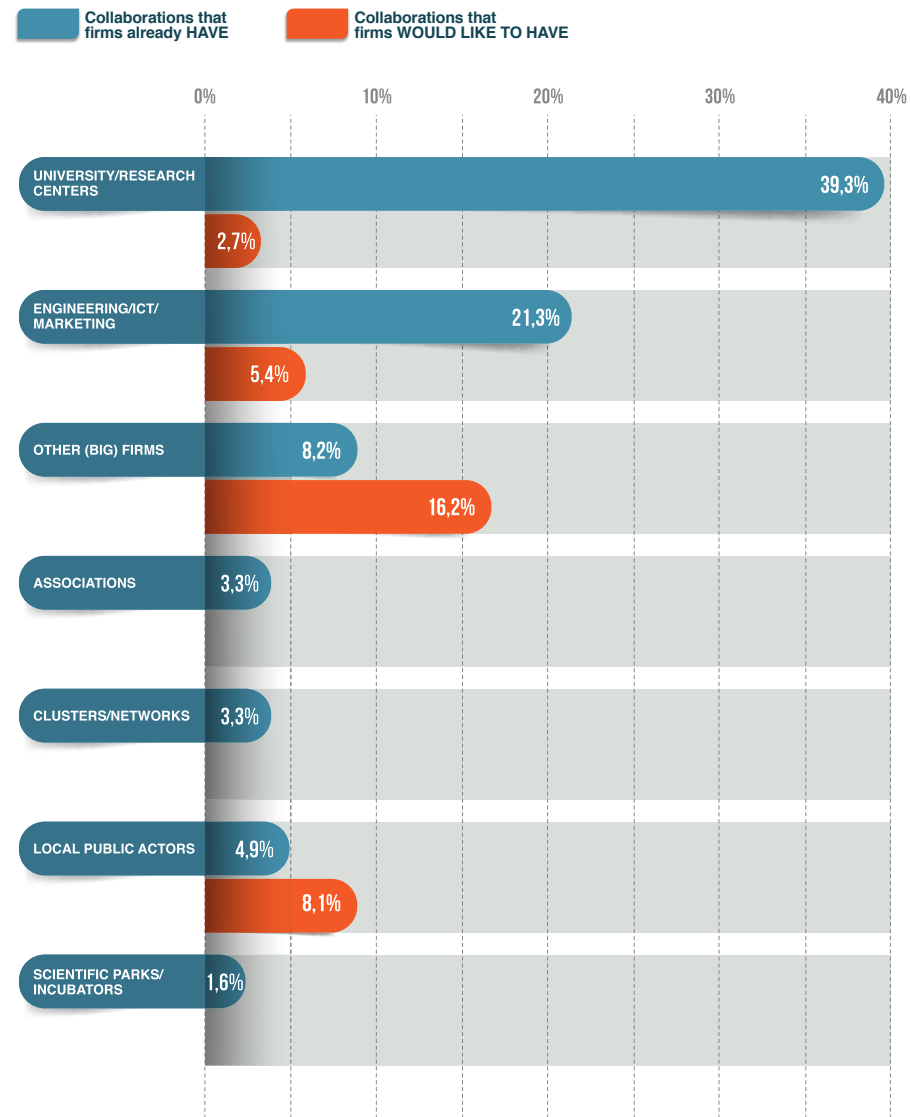
WHAT ARE THE MAIN CHALLENGES OF THE BLUE ECONOMY?
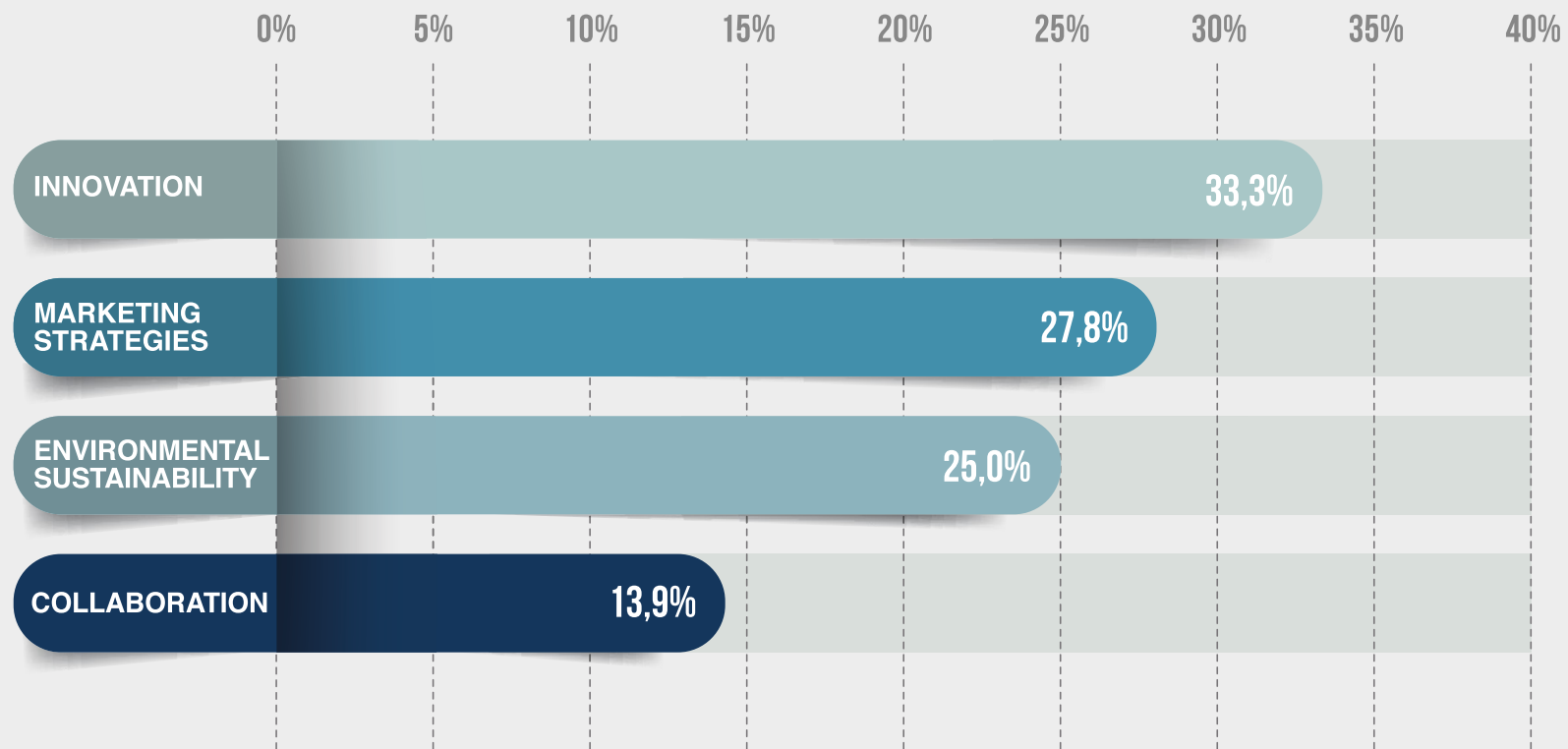
	0%	5%	10%	15%	20%	25%	30%	35%	40%

INNOVATION — 33,3%

MARKETING STRATEGIES — 27,8%

ENVIRONMENTAL SUSTAINABILITY — 25,0%

COLLABORATION — 13,9%

ANALYSIS OF THE INNOVATION CAPABILITIES OF BLUE SMES AND ENHANCEMENT OF THEIR INNOVATION SKILLS

Aim of the WP4 of the BEAT project was to help SMEs operating in blue sector and its related blue value chain to improve their ability to organize and manage their innovation processes by focusing on how the employees' creativity can be raised in a more effective way.

In total, 18 Croatian firms plus 24 Italian organizations (3 bigger firms and 1 technology park included) received at least a benchmarking report.

In the final report we presented some statistics related to all the responses received from firms, and compare trends, means and other statistical information related to Italian and Croatian firms concerning the following characteristics:

- gender distribution
- age distribution
- level of education
- working experience
- **Working years with current supervisor**

Innovation capabilities: some results

A. Defensive pessimism
Defensive pessimism is a strategy which people use when preparing for performance situations. They may feel anxious and out of control and they set low expectations for their performance and extensively think through alternative plans.

B. Creativity
Creativity in the workplace consists in the production of novel and useful ideas or situations. What comes out from the data, is that both Italian and Croatian employees self-assess their creativity contribution in a quite generous way. This is good, since it means that creativity is, in general, not just tolerated, but explicitly encouraged in the sector.

C. Innovation implementation

Innovation implementation is the "other side" of creativity and refers to the implementation of innovations, such as the initiation and intentional introduction of new and useful ideas, processes, products or procedures in an organization. The data reveal one important thing: innovation implementation, in general, scores lower than creativity. Meaning that when it comes to provide tools, resources and time to people to put in action their ideas, all companies tend to be "less generous".

D. Ambidextrous organizational culture

Organizational culture refers to the underlying values, beliefs, and principles that serve as a foundation for an organization's management system. Even in relation to this construct, Croatian firms score significantly higher than Italian firms. Hence a better circulation of information (and mutual respect) characterize companies of the blue-tech sector from the Croatian side.

E. Entrepreneurial passion

Entrepreneurial passion is defined "as consciously accessible, intense positive feelings toward entrepreneurial tasks and activities, associated with roles that are meaningful and salient to one's self-identity". In this specific case, lower levels are preferred since they testify lower levels of exploitative leadership style. Croatian firms act as benchmark for the sample and rank much lower than Italian ones.
After first data collection, firms were re-assessed through an on-line survey. Aim of this second survey had been to understand to what extent firms have benefited from the suggestions provided by the benchmarking, in which ways SMEs improved their organizational and managerial routines to better manage their innovation processes and to what extended.

The benchmarking has helped to show avenues of improvement in the future. In particular, some firms had declared that indeed the benchmarking had helped to understand their employees better. The benchmarking had been so useful that various participating firms have asked for its repetition in the future.

GOVERNANCE MODEL FOR THE DEVELOPMENT OF A BLUE ECONOMY ITALIAN-CROATIAN TRANSNATIONAL CLUSTER

European Cluster Observatory states: "clusters cannot be understood as fitting into the narrow sectoral view that most industrial policies have, but should be considered as regional ecosystems of related industries and competences featuring a broad array of inter-industry interdependencies. They are defined as groups of firms, related economic actors, and institutions that are located near each other and have reached a sufficient scale to develop specialised expertise, services, resources, suppliers and skills.

A Cluster model is based on the three main elements:

1) the concentration in a well-defined area;

2) a number of firms and institutions that could be interconnected;

3) the presence of firms specialised in the production of different intermediary or final goods as well as of services and technologies, related to one specific field.

It is important to notice that this definition of a cluster considers the co-existence of a set of different actors, firms, service and technology providers, but also institutional actors, operating in the main industry and/or in the related ones, as the main feature to achieve the development and competitive purposes.

The cluster model is not a unique framework, but it may have different forms. The classification is based on some cluster features, such as the firm size distribution, the industrial linkages and network within the cluster, the degree of vertical disintegration, the governance structure, the innovative capabilities and the organization of the production. Moreover, other aspects regard the role of the large firms, the way companies were embedded within the cluster's network, nationally and internationally, the major industries' development dynamics, the region potential trajectories and the role of the public institutions as policy-makers, producer and consumer at the local/regional and national level and in assuring innovation.
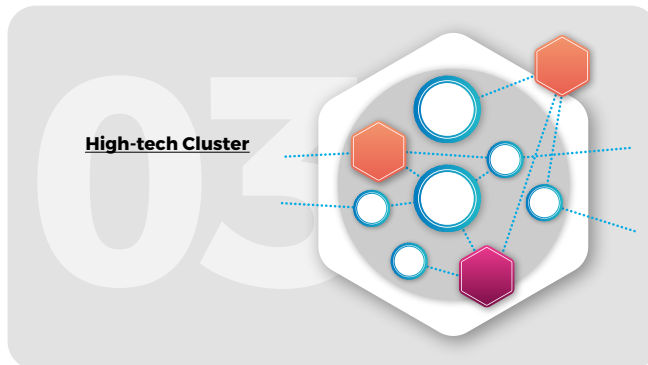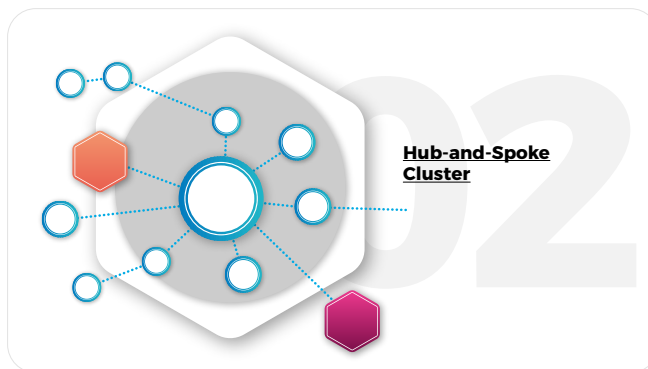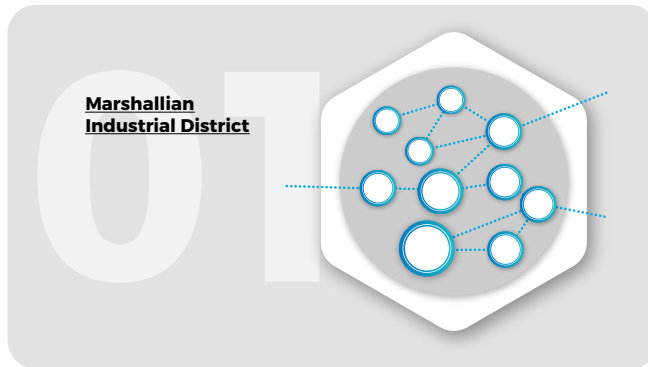
Table 1: Clusters mapped in the Blue Tech Project useful for the BEAT Project

Name of the cluster	Country/Region	Reference industry
Maritime Technology Cluster FVG	Friuli Venezia Giulia – Italy	Maritime technologies
NAVTEC	Sicily – Italy	Maritime Transport and Maritime Technologies
Apulia Nautical District	Apulia – Italy	Nautical
Jadranski pomorski klaster	Croatia	Shipbuilding
MarC	Croatia	Maritime sector
Cluster "Arredo e Sistema Casa"	Friuli Venezia Giulia – Italy	Furniture and home system
CBM - Cluster Smart Health	Friuli Venezia Giulia – Italy	Smart health
COMET	Friuli Venezia Giulia – Italy	Components and thermoelectromechanics
DITEDI	Friuli Venezia Giulia – Italy	Information and communication technologies
Legno Arredo del Trevigiano	Veneto – Italy	Wood furniture
Cluster Marche Manufacturing	Marche – Italy	Manufacturing
Cluster of plastic and tool	Federation Bosnia and Hercegovina – BiH	Plastic and tool
Klaster DRVO	Republika Srpska – BiH	Wood processing and furniture
National Technology Cluster – Cluster Trasporti Italia 2020	Italy	Transport Technologies

In the Blue Tech Project, the key role of collaboration among the Croatian cluster "MarC" and the "Maritime Technology Cluster FVG" for the support the inter-cluster relationships has been highlighted. In a strategy perspective, the Cluster Management Organization (CMO) should take into consideration the development of relationships with these other clusters. The creation of a CMO is essential and instrumental in order to support the development of a cluster as from it depends the Governance of the Cluster.
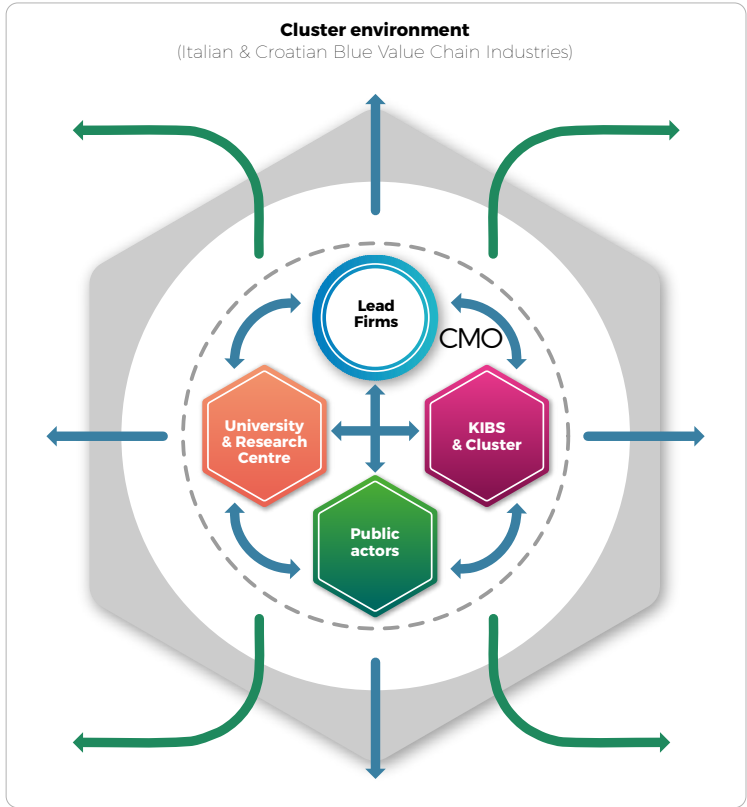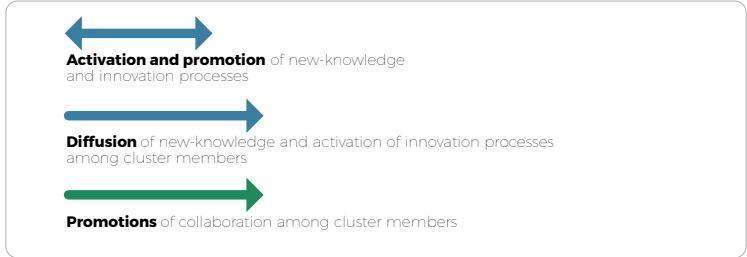
Cluster models

Firms (circle=size) KIBS Universities & Research centres

01

Marshallian Industrial District

02

Hub-and-Spoke Cluster

03

High-tech Cluster

Source: adapted from Püchner et al., 2014

CMO structure for the trans-national cluster in the Blue Economy

Activation and promotion of new-knowledge and innovation processes

Diffusion of new-knowledge and activation of innovation processes among cluster members

Promotions of collaboration among cluster members

Cluster environment
(Italian & Croatian Blue Value Chain Industries)

Lead Firms

CMO

University & Research Centre

KIBS & Cluster

Public actors

PROJECT PARTNERS

Unioncamere Veneto

NORTH ADRIATIC SEA PORT AUTHORITY

ConCentro
AZIENDA SPECIALE
CAMERA DI COMMERCIO
PORDENONE

UNIVERSITÀ
DEGLI STUDI DI TRIESTE

mare Technology Cluster FVG

ida
ISTARSKA RAZVOJNA AGENCIJA

SVEUČILIŠTE U RIJECI

CONTACTS

Unioncamere Veneto
europa@eurosportelloveneto.it
Tel. +39 041 0999411