

BRETAGNE 

Defence & Security

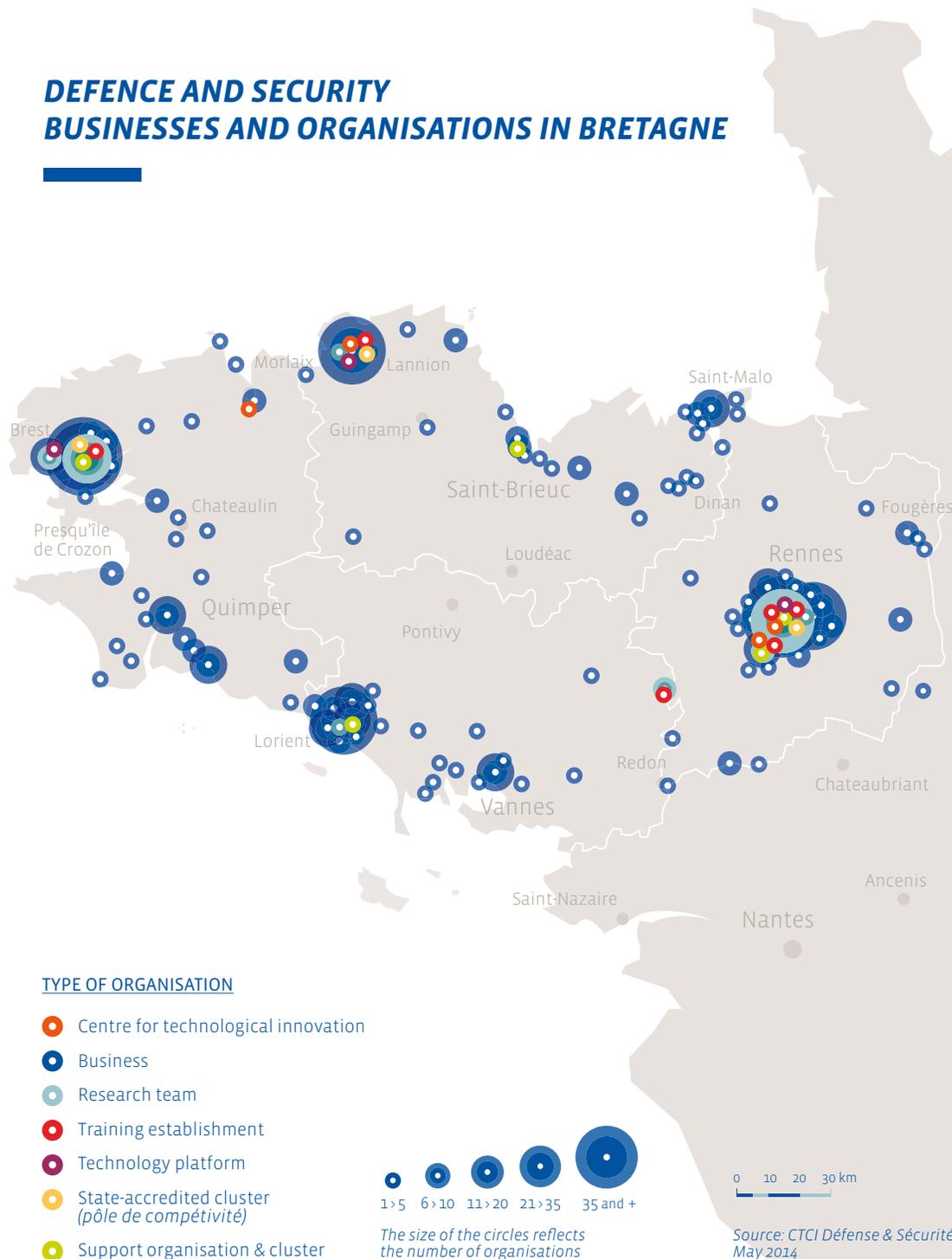
TECHNOLOGICAL INNOVATION

*for defence
and security*



DEFENCE AND SECURITY, Bretagne at the forefront

DEFENCE AND SECURITY BUSINESSES AND ORGANISATIONS IN BRETAGNE

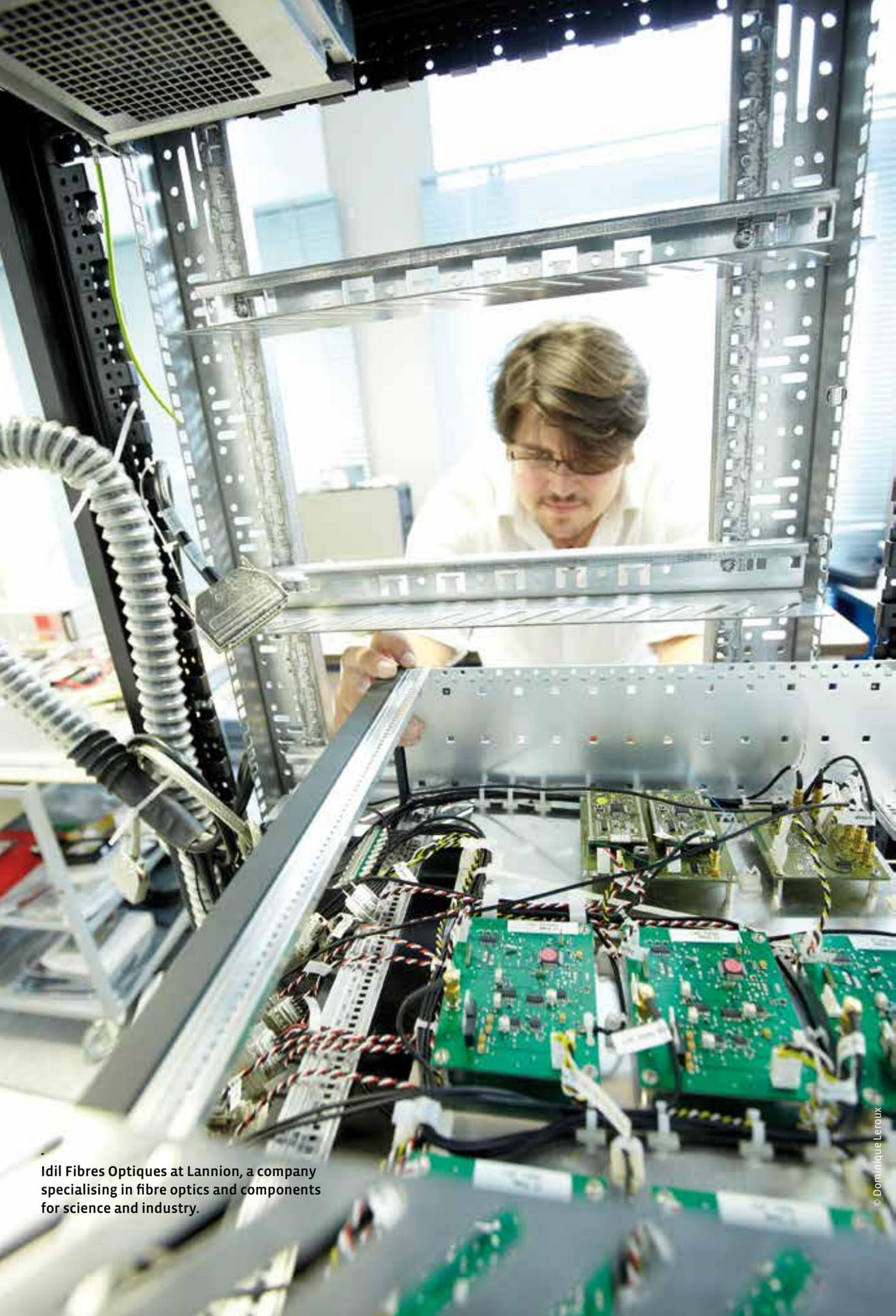


As France's 5th industrial region, Bretagne has always been prominent on the nation's maritime and military scene. This is truer today than ever before since the region is making significant headway in the leading hi-tech sectors, drawing on the businesses that make it a key player in defending France's sovereignty.

DEFENCE AND SECURITY IN BRETAGNE: A COMPREHENSIVE INDUSTRY

- DGA (government defence procurement agency), Marine Nationale (French Navy)
- 2 large groups - Thales and DCNS
- 383 businesses (50% services and research, 50% industry)
- The *Pôle National d'Excellence Cyber* (national cyber area)
- 7 innovation clusters
- 11 grandes écoles and university establishments
- 7 resource centres, platforms and technical centres
- 47 research teams

Source: CTCI Défense & Sécurité – May 2014
 The CTCI Defence & Security is an informal technical consultative body managed by Bretagne Développement Innovation. Its membership includes: IEF AERO, Bretagne Pôle Naval, Direccte Bretagne, Pôle Mer Bretagne Atlantique, Images & Réseaux, Meito, Photonics Bretagne, the Chambre de Commerce et d'Industrie de la région Bretagne, E.D.E.N. Bretagne, Université Européenne de Bretagne, IENSTA Bretagne, Direction Générale de l'Armement, Bretagne Commerce International, Technopole Rennes Atalante and Bretagne Region.



Idil Fibres Optiques at Lannion, a company specialising in fibre optics and components for science and industry.

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A DENSE AND STRUCTURED NETWORK with over 500 organisations

The industry can rely on a wealth of technological and human potential for its future development. Furthermore, a vibrant and structured network is in place ready to take on the strategic challenges facing France.

A NETWORK OF BUSINESSES SERVING DEFENCE REQUIREMENTS

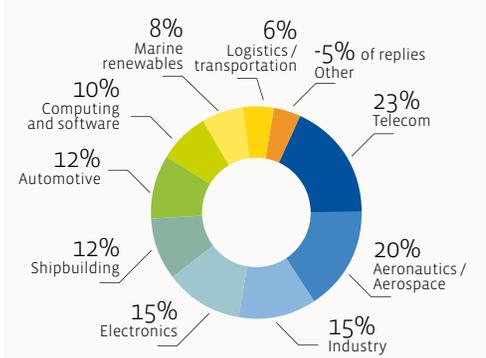
A network of over 383 regional businesses operates in the Defence and Security sectors, with most of these companies covering both civil and military markets.

Among these, two major industrial contractors can be pointed out:

- **DCNS – a leader in naval defence.** The Group is recognised worldwide for its exceptional know-how in designing, building and servicing surface combatants and submarines. It also develops solutions in civil nuclear engineering and marine renewable energy.
- **Thales – a world leader in high-tech solutions** for aerospace, transportation, defence and security markets. With a staff of 65,000 including 2000 based in Bretagne, Thales' unique capabilities allow it to design and deploy equipment, systems, and services to meet even the most complex security requirements.

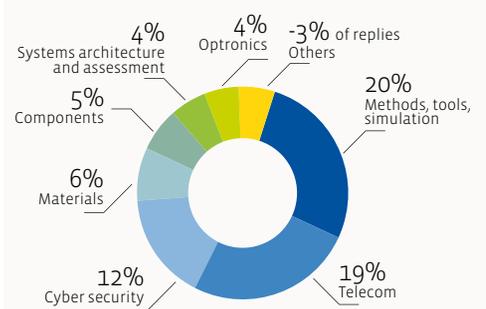
The most prominent customer with regard to the defence technological and industrial base is the French state's defence procurement agency, DGA. Its mission is to oversee major defence programmes, prepare defence systems for the future and to promote arms exports. In Bretagne, DGA has two divisions, one near Rennes specialising in information management, and the other in Brest, focussing on naval capabilities.

HOW REGIONAL DEFENCE BUSINESSES ARE POSITIONED ON OTHER MARKETS (several answers possible)



Most businesses are balanced between civil and military activities, and this is a strong feature in the region. Source: CTCl Défense & Sécurité – May 2014

TRADES PERFORMED BY REGIONAL SMEs IN THE DEFENCE AND SECURITY INDUSTRY



The large number of businesses operating in the Defence and Security industry means that many DGA listed trades are covered (22 out of 27), with the naval sector and electronics being the most represented. Source: CTCl Défense & Sécurité – May 2014

SUPPORT ORGANISATIONS DRIVING THE INDUSTRY FORWARD

- *The regional development and innovation agency, BDI*, works alongside its partner organisations to set out the industry's strategic roadmap. It acts as an important interface between industry, business and regional government, promoting the region's technological, industrial and human capabilities both in France and abroad in partnership with *Bretagne Commerce International*.
- *2 state-accredited clusters: The Pôle Mer Bretagne Atlantique* is a driver for an innovation-led maritime sector and a defender of a committed maritime policy. In conjunction with its fellow cluster, *Pôle Mer PACA*, in the south of France, it represents a real powerhouse on the world stage promoting France's maritime excellence. The second cluster is known as *Images et Réseaux*, and helps to set up collaborative projects in technology and services relating to telecommunications, internet, television, imagery and the digital sector.
- Various partner clusters support businesses operating in defence markets: *Bretagne Pôle Naval* (shipbuilding, marine renewables and Oil and Gas), *E.D.E.N. Bretagne* (European Defence Economic Network, specialising in combined armed forces defence and security issues), *IEF AERO* (aerospace and defence/security), *ACAD* (alliance compétence aéro défense), *MEITO* (a regional skills network specialising in the digital sector and promoting its innovations in the use of electronics, IT and telecommunications), *Photonics Bretagne* cluster.

LEADING MILITARY SITES

Most of Bretagne's prominent military sites are located in three districts: Rennes, Lorient and Brest.

- **Brest:** this military district is the largest in France and covers defence responsibilities between the Mont-Saint-Michel on the north coast, down to the Spanish border. The Port of Brest is France's largest port on the Atlantic coast and home to around a quarter of the country's naval fleet. This naval base serves as both a maintenance port and a port of call for nuclear powered vessels. The FOST (strategic oceanic force), France's main nuclear force component is based in Brest. There is a ballistic submarine base located at Ille Longue, on the Crozon peninsula slightly away from the main port. The naval air station at Lanvéoc-Poulmic is a specialised centre for helicopter over-flight and maritime operations. The Landivisiau naval air station operates in a support capacity for the Charles de Gaulle aircraft carrier and is where the carrier aircraft are stationed.
- **Lorient:** this district includes the Lann-Bihoué naval air station, and Fumaco (marine commandos).
- **Rennes:** this district is home to the 11^e régiment d'artillerie de marine (11th Marine Artillery Regiment) based in St Aubin du Cormier near Rennes, (the most modern artillery and intelligence in the French armed forces), the 2^e régiment du matériel (responsible for maintaining operational capability), DGA information management division, and the DGA combined services infrastructure and information systems division.
- The 3^e régiment d'infanterie de marine, based in **Vannes**, is part of ground forces command. Its missions are mainly focused on overseas territories and central Europe.



NAVAL DEFENCE: BRETAGNE LEADING THE WAY

In shipbuilding and repair, Bretagne is France's foremost region. Its exceptional know-how enables the region to reach out to whole world.

Shipbuilding and repair: **France's top-ranking region** with some 415 establishments and 8000 employees representing 3/4 of the sector's workforce. Defence largely dominates (involving 2/3 of jobs) with the DCNS sites in Brest and Lorient which employ 4,600 workers. It is therefore a driver of the regional economy making Bretagne once again the foremost region in shipbuilding, this time specifically for military purposes.

The industry features a large innovation capacity that draws on a vibrant training and research base. It is this **technological capability** that is used to produce complex and premium modules which are then sold throughout the world. As this activity generates a lot of exports, it comes within Bretagne's strategic innovation areas: *Boats of the Future and Maritime Security and Safety*.

Some of the key businesses among the **137 organisations** listed in Bretagne specifically in this area: DCNS, Chantiers PIRIOU, STX France, Damen Shiprepair, IxBlue, etc.

The multimission frigate FREMM Normandie – DCNS in Lorient.

Bretagne at the cutting-edge of TECHNOLOGICAL INNOVATION

At the intersection of its defence and digital sectors, Bretagne is actively involved in developing the key technologies needed to modernise and diversify the equipment France must rely on if it is to fulfil both its responsibilities and ambitions.

NKE in Hennebont, a company specialising in electronic measuring instruments.



NEW TECHNOLOGIES AND STRATEGIC FIELDS OF INTEREST

Bretagne is France's leading region for European technology patent applications and boasts a vibrant and wide-ranging research base, in both the public and private spheres. The region has around 5000 research staff and engineers working in some 47 research units on strategic topics with defence and security applications: Optronics / Opto-electronics / Cryptography / Sensors / Telecommunications / Data management / Mechatronics / Materials / Cyber security / Operational information systems.

BUSINESSES LEADING THE WAY IN TOMORROW'S KEY TECHNOLOGIES

Many of the region's businesses are involved in developing key technologies of the future: 28% of them work in data transmission (broadband networks, wireless technology, opto-electronics...), 27% in systems (complex systems engineering, M2M, mechatronics), over 8% in materials (composites, nanomaterials), and almost 8% in embedded software.

A partnership between Bretagne Region and the Ministry of Defence was agreed in 2012 for developing dual research activities. The aim is to boost SME's and intermediate-sized companies by sharing information, and coordinating and supporting innovative projects initiated by industry.

An example:
The Photonics Bretagne cluster operates in a key European technology area, considered as the electronics of the 21st century. Photonics came about in Bretagne during the eighties and has made the region one of the internationally renowned centres for special fibre optics and fibre components with applications in many fields (defence, agri-food, health, environment, automotive, etc.)

RESEARCH AND DEVELOPMENT UNITS ROOTED IN REALITY AND SPECIALIST GRANDES ÉCOLES

- *The Université Européenne de Bretagne* is one of 9 umbrella organisations for higher education and research set up by the French government in 2007. It brings together 23 grandes écoles and universities, and promotes Bretagne's higher education and research both in France and abroad.
 - *IRMAR (mathematics research institute, part of Université de Rennes 1)* brings together 230 mathematicians for research on digital modelling and analysis, and probability/statistics, with emphasis on algebra and cryptography interfaces.
 - *The research teams from IETR* specialise in information and communications. They work alongside industry players and contribute to the activities of the state-accredited clusters.
 - *Supélec* is a major engineering college. It is prominent in information science, energy and systems. Research teams work on automation, signals and statistics, IT and networks, telecommunication, electromagnetism, micro-electronics and photonics, and energy.
 - *ENSTA Bretagne* is a top engineering college specialising in mechanical industries, electronics and IT.
 - *Ecole Navale* is a higher educational establishment providing initial training to naval officer cadets for high-level duties.
- *The St-Cyr Coëtquidan military colleges* train officer cadets to become leaders in the Army. They also undertake research into science and defence technologies.
 - *ESAT-Rennes* provides training in information and communications systems, as well as in intelligence and electronic warfare.
 - *ENSSAT-Lannion* is a college specialising in the electronics, IT, and optronics sectors.
 - *ENS Cachan* provides courses in higher education teaching and research with particular interest in IT, telecommunications, mathematics and mechatronics.

There are also more broad-based establishments that form part of Bretagne's excellence in defence and security:

Telecom Bretagne in Brest (multidisciplinary engineering college and international research centre for information sciences and technology), the *Université de Bretagne Occidentale, Lab-STICC in Brest, Lorient and Vannes* (laboratory specialising in science and techniques relating to information, communication and knowledge), *ISEN in Brest and Rennes* (specialising in electronics and digital technology), the *CERV in Brest* (European Centre for Virtual Reality), *IRISA in Rennes* (IT and random systems), the *SHOM in Brest* (hydrography and oceanography division of the French Navy), *INSA, IRT B-COM, IUT de Lannion, Lycée Félix Le Dantec*.

BRETAGNE, A NATIONAL LEADER IN CYBER SECURITY

The Pôle d'excellence cyber (cyber cluster) exemplifies Bretagne's leadership in cyber security which has become a government priority.

The cluster was officially launched at the beginning of February 2014 by defence minister Jean-Yves Le Drian as part of the Government's wider cyber defence strategy. Bretagne Regional Council is also backing the development of a cyber security industry which comes under the Government's economic recovery package for the region. The ability to defend against and counter cyber attacks, and to identify their authors has now become a sovereignty issue beyond the actual defence sector itself.

The cyber cluster's vocation is to draw together the expertise from across the region. This refers to skills from education, research and technology, but also from economic development. The Pôle d'excellence cyber has had its research and technology budget tripled in order to provide greater support to SMEs and research laboratories in this field. In the Rennes area, training establishments Saint-Cyr Coëtquidan and ETRS, along with the DGA information management division are able to support the cluster directly.

The fields of technical expertise relating to cyber security: cryptology, micro-electronics, architecture for security equipment and for IT and industrial systems, analysis of soft and hardware etc...

The MEITO network has identified around **75 businesses** working in cyber security in the region today: leaders such as Thales, Orange Labs, Cap Gemini, Alcatel Lucent, Sopra Group... There are also SMEs delivering technological solutions covering the whole cyber security value chain.

13 academic research teams working in cyber security including 7 in particular that work in cyber defence (IRISA, Lab-STICC, IRMAR, IETR, etc.)

The cluster can draw on the availability of **high-level courses** (Université de Rennes 1, Telecom Bretagne, INSA Rennes, ENSIBS, IUT de Bretagne, ENSSAT, etc.)

The **first Chair in cyber defence and cyber security** Saint-Cyr Sogeti Thales was inaugurated in July 2012. Its ambition is to anticipate cyber threats by combining skills from the military and civil sectors. Two further Chairs have been founded, one at Ecole Navale (naval sector) and the other at Supélec (research on vulnerability)

An **on-line directory** has been introduced which lists the **businesses and organisations** from the digital sector working on defence applications. It is available at: www.meito.com

IN THE SPOTLIGHT...

DGA Maîtrise de l'Information (Defence procurement agency - information management division)

DGA Maîtrise de l'Information is based in Bruz, near Rennes and responsible for providing technical expertise to the Ministry of Defence on information/communications systems, electronic warfare, and tactical/strategic missile systems. It was formed from the CELAR - a centre for weapon electronics set up in 1968 - and from LRBA - a research laboratory in ballistics and aerodynamics set up in 1946.

It has a staff of over 1,250 including 2/3 who are engineers at the site. Some €30m of all its annual procurement expenditure, worth €60m, goes to companies based in the region.

As the Ministry of Defence's agency for cyber security, DGA Maîtrise de l'Information constitutes one of the pillars of Bretagne's cyber cluster: 250 high-level experts are already designated to cyber activities, a figure that is set to rise to at least 400 by the year 2017.

INNOVATION FOR DEFENCE AND SECURITY

A dense and structured network of almost 500 organisations

Marine nationale, DGA-Maîtrise de l'information, DCNS, Thales Group, 383 small sub-contractors, Pôle d'excellence cyber (cyber cluster), 7 clusters including state-accredited clusters (pôles de compétitivité), 11 higher education establishments including grandes écoles, 47 research teams, 7 resource centres, platforms and technical centres.

A region at the cutting-edge of tomorrow's key technologies

Telecommunications, IT, electronics, photonics, robotics, information systems security, opto-electronics, cryptography, mechatronics, materials, cyber security.

Contact :

Frédéric Rode / Managing director
of Bretagne Développement Innovation
f.rode@bdi.fr / +33(0)2 99 84 53 00

Find out more:

www.invest-in-bretagne.org/defence

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Bretagne Développement Innovation
Siège : 1 bis, route de Fougères • 35510 Cesson Sévigné • France • T. +33 (0)2 99 84 53 00
Bureau de Brest : 1, rue Parmentier • 29200 Brest • France • T. +33 (0)2 98 43 81 62