

**APPEL A PROJETS
IDEX
CALL FOR PROPOSALS
IDEX 2 | PRE-SELECTION
PHASE**

**Acronyme du projet / IC
West**

**DOCUMENT DE SOUMISSION /
SUBMISSION FORM**

Acronyme du projet d'Idex / Acronym of the project	IC Ouest
Titre du projet en français	Innovation Campus Ouest
Project title in English	Innovation Campus West (IC West)
Personne responsable de la coordination du projet / Project manager	Nom / Name : Guy Cathelineau, Président du PRES Université Européenne de Bretagne, UEB Coordonnées: Tel. + 33 (0)2 23 23 79 60 - Fax. + 33 (0)2 23 44 84 55, president@ueb.eu
Institution portant le projet (le porteur) / Institution leading the project (Project leader)	Nom / Name : PRES Université européenne de Bretagne au nom de la Fondation IC Ouest (FCS à créer)
Dotation en capital demandée en millions d'€ (a) / Capital grant requested M€ (a)	738,881 millions d'€ / 738.881 million €

(a) Voir le § 4.1 du règlement relatif aux modalités d'attribution des aides au titre de l'appel à projets Initiatives d'excellence. / See the document entitled « règlement relatif aux modalités d'attribution des aides au titre de l'appel à projets Initiatives d'excellence » (§ 4.1).

Structure of the Idex partnership

Etablissements d'enseignement supérieur et de recherche / Higher education and research institutions	Organismes de recherche / Research institutes	Autres / Other¹
PRES UEB	CNRS	
PRES L'UNAM	INRIA	
	IFREMER	
	INSERM	

Pour les dossiers déposés en première vague lors de l'AAP (Idex 1), indiquer les éventuels changements par rapport à la composition figurant dans le dossier déposé en phase 1.

The project is submitted by a consortium composed of the six above mentioned members.

In contrast to its first application with a partnership of 51 members, this second IC West application has reduced its partnerships to 12 core members: 4 research institutes, 3 universities (Rennes 1, Nantes and Brest at UBO), 3 *grandes écoles*, PRES UEB and L'UNAM.

¹ Par exemple : CHU, Pôles de compétitivité, etc. / For instance : CHU, competitiveness clusters, etc.

1.	EXECUTIVE SUMMARY.....	4
1.1.	A reinforced ambition	5
1.2.	Priority action programmes to sustain the triple signature of IC West: Departments of Excellence, innovation, and agile management.....	6
1.3.	The partners of IC West.....	7
1.4.	Governance, monitoring processes and financial aspects of IC West.....	7
2.	DETAILED DESCRIPTION OF THE PROJET – PRÉ-SÉLECTION PHASE	9
2.1.	Ambition and strategy	9
2.1.1	IC West, an experimental decentralized higher education, research and innovation system based on four knowledge domains, addressing major scientific and societal issues 10	10
2.1.2	Departments of Excellence: a structuring mode for the integrated development of excellence in education, research and innovation	11
2.1.3	IC West perimeter of excellence based on a potential of four Departments of Excellence, and scheduled to evolve in the future	13
2.1.4	The strategic priorities of IC West and related actions	14
2.1.5	The governance of IC West: efficiency and agility	15
2.1.6	Towards a transformation of the research and higher education system in western France 16	16
2.2.	Structure and characterisation of the initiative of excellence.....	17
2.2.1	Presentation of the project leader (including legal status)	17
2.2.2	Higher education, research, and innovation in Brittany and Pays de LA Loire	19
2.2.3	Application to the actions of the programme "investissements d'avenir"	22
2.2.4	Excellence perimeter, environment, prospects and added value	29
2.3.	Project and prospects	44
2.3.1	Priority n°1: Create excellence departments with international reputation and attractiveness 45	45
2.3.2	Priority n°2: making innovation the driving force of IC West	50
2.3.3	Priority n°3: ensure the enlargement of the excellence perimeter as well as excellence of infrastructures	55
2.4.	Governance, organization and management.....	59
2.4.1	Efficiency and agility as governance principles	59
2.4.2	Overall organisation of the governance	60
2.4.3	The transformation model of IC West	62
2.4.4	Project organisation 65	65
2.5.	Means	67
2.5.1	Justification of the concentration of the means on the excellence perimeter	67
2.5.2	Justification of the requested means in connection with the strategy, the objectives and the dynamics 67	67
2.5.2	The principles of cofinancing and the mobilisation of the external resources	68
2.6.	Human Resources	68
2.6.1	Human resources within the projects and perspectives	68
3.	KEY DATA AND FINANCIAL PLANNING.....	70

1. EXECUTIVE SUMMARY

During its recent evaluation, IDEX International Jury emphasised the fact that the IC West project should work towards evolving in three specific directions so as to:

- Build a clearer scientific project, based on a limited number of key actions, in order to reinforce the added value and the “impact” of the project,
- Define more precisely and strengthen the excellence perimeter of the project,
- Redefine the internal governance of the IDEX, together with its relationship with a global project for the Western regions research and higher education system (RES).

In parallel, within the framework of the first IC West proposal and other call for proposals from the “*Investissements d’avenir*” programme, Brittany and Pays de la Loire were able to put forward irrefutable merits and highly dynamic collaborations. These aspects go towards providing both regions with numerous assets to becoming, in the near future, one of the most attractive innovation areas in Europe.

This is why the PRES of both regions decided to present a new proposition for the second IDEX call for proposals. The result of the first call recognised the excellence of our regions with:

- 3 Laboratories of Excellence: *Mer* (260 FTE researchers and 169 PhD students), *Comin’Labs* (375 FTE researchers and 450 PhD students) in the domain of information and communication sciences, *Storex* (energy storage) in partnership with *Université de Picardie* and CNRS. It is to be noticed that the size of our Labex is larger than the national average, and this situation results from an exemplary and very fruitful structuration process.
- IRT Jules Verne, already selected in the field of materials and processes, IRT B-Com in information and communication sciences, and IEED energies of the ocean, to be confirmed in a few weeks; the “promising IHU” transplantations and immuno-therapies, one of the 2 industrial demonstrators selected, in partnership with the Evry Genopole. With two IRT and an IEED, the west of France is clearly the leading region for research in partnership with industry.
- Several Equipex and participations to cohorts.

From this standpoint, IC West, in this new proposal, aims at creating an integrated network of tightly focused Departments of Excellence, which focus on research, higher education and innovation, and aim to establish them as world-class institutes of excellence, together with national research institutions. To consolidate this project and serve these ambitions, the consortium has taken the following set of actions. It will:

- Strengthen the coherence of its global strategy, from its original ambitions to the development of IC West priority actions.
- Tighten its excellence perimeter, together with research institutions, and strengthen the coherence and impact of this perimeter.
- Target the resources of IC West on a limited number of actions, implementing clear strategic priorities.
- Strengthen education-related actions.

- Strengthen IC West governance through limiting the number of founding members, simplifying organisation, efficient and agile decision-making processes, funding allocation, and control procedures.
- Clearly outline its human resource policy.
- Clarify the changes on an inter-regional level with regard to the research and higher education system that IC West strives to attain.

The proposal presented here significantly differentiates from the first IC West project submitted in January 2011. Taking into account the outcome of the first call for proposals, it capitalizes on the initial results of the excellence initiative of both regions to build a new, focused, and original project.

1.1. A REINFORCED AMBITION

IC West is an innovative research and higher education network of thematic based Departments of Excellence organised in Brittany and Pays de Loire. The goal of IC West is to support four main excellence domains in research, education and innovation and to establish them as world-class institutes of excellence, highly attractive on the international scene. This precursor project will contribute to the creation of a unique, an original, an outstanding, and an attractive place for education, research and innovation in Western France.

IC West intends to significantly contribute to the current national effort in addressing major scientific and societal issues through the inter-disciplinary research conducted in its four Departments of Excellence. They include:

- The impact of climate change on biodiversity and ocean behaviour.
- The development of personalised medicine.
- The digital environment of the future at the service of the citizen and trans-disciplinary applications.
- Performing co-conception products/processes for a competitive and “0-carbon-emission” industry.

This ambition builds its foundations on two models that inspire our reflections and lie at the core of our project:

- The University system model, as implemented for example by the University of California, Quebec University or University of Maine System. IC West prefigures the emergence of such a research and education system in Western France, based on four fields of excellence. Eventually, this will lead to the creation of a decentralized networked university system in the two regions.
- The Japanese World Premier Institute (WPI) model established in 2007, with the reference of the Advanced Institute for Materials Research Institute at the University of Tohoku. This model inspires the Departments of Excellence that are the core of IC West.

1.2. PRIORITY ACTION PROGRAMMES TO SUSTAIN THE TRIPLE SIGNATURE OF IC WEST: DEPARTMENTS OF EXCELLENCE, INNOVATION, AND AGILE MANAGEMENT

As a priority, IC West naturally aims at boosting established excellence in research, innovation and education so as to reinforce the visibility and attractiveness of the excellence fields and their geographical sites. It will also lead these sites to be in a position to play a major role in research at an international level. It also intends to respond to major national and international scientific, economic and social issues.

The excellence perimeter of our initiative is clearly defined, both initially (T0), and in the mid-term. It concerns about 1,600 to 2,000 academics within 4 main excellence fields: the 21st Century Ocean, Information and Communication Science and Technology, Materials Science and Engineering, Biomarkers and Biotherapies. This perimeter constitutes a significant force at the European level, and at the same time, focuses on the efforts of our research capabilities. This perimeter is built around excellence laboratories and institutes already labelled by the “*Investissements d’avenir*”, and on a few, strategic new Labex submitted to the second call.

IC West organises its perimeter in the form of Departments striving to become excellence institutes at international level in terms of critical mass, scientific production, research capacities and higher education, addressing major scientific, economic and social challenges. These Departments are tightly integrated all the while enjoying a strong autonomy.

To make this project effective, IC West will implement a set of targeted actions and will have a tight but open governance system to support the reinforcement of excellence within the Departments, to boost innovation within the perimeter and outside, and to enlarge the excellence perimeter. IC West will contribute to the creation of new and attractive working environments for researchers based on the following priorities:

1. Strengthening its excellence fields in order to create attractive world-class research captivators, the Departments of Excellence
2. Making innovation a driving force of IC West
3. Ensuring the extension of the excellence perimeter as well as the excellence of infrastructures.

The major axes of action implied to attain those priorities will include: strengthening Departments of Excellence in research and education; developing international partnership research; increasing partnership innovation through experimentation; ensuring the evolution of the excellence perimeter; ensuring the performance of infrastructures. IC West will constitute a highly integrated management device for (i) the standardisation of the main cross-cutting processes or (ii) the creation of shared facilities. This will mainly cover:

- IC West governance and the implementation of a unified governance information system,
- IC West communication and publication policy, which will be standardised and integrated,
- HRM between the different institutions, which will be harmonised and integrated,
- IC West overall financial management to be unified.

Finally, even though integration is not based on an institutional merging scheme, it should result in strong structuring of the fragmented current situation. Given the specificities of IC-West, i.e. (i) a vast territory covering two regions (Brittany and Pays de la Loire), (ii) around 20 higher education establishments (including four research institutes, seven universities, and several *grandes écoles* and major research centres) and (iii) the large number of researchers and students involved, its vision for the next 5- to 10-years is to set up the conditions for the emergence of a federated and networked university system – as per the current North American university system. The aim is to foster the regions scientific development so that it benefits not only local citizens, but also the economic stakeholders involved.

1.3. THE PARTNERS OF IC WEST

IC West is represented by a consortium of institutions that constitute a new step in the arrangement of the research and higher education system (RES) in Western France: the PRES UEB and L'UNAM, and the national research agencies INRIA, IFREMER, CNRS and INSERM.

The creation of the UEB and L'UNAM PRES four years ago was an important step towards the federation of the main higher education institutions and research agencies in Brittany and Pays de Loire. The PRES have, in particular, facilitated the development of relations between universities and *grandes écoles*. IC West is now a unique opportunity to engage towards a new organisation of the RES on the scale of the two regions, a condition to reach a minimal critical size and visibility, by federating the members of both PRES. This approach will eventually lead to a merger of the PRES.

IC West is also an opportunity to strengthen the partnership between higher education institutions and national research agencies. These will bring a decisive power and visibility in research. This is the reason why INRIA, IFREMER, CNRS and INSERM are co-bearers and co-founders of the consortium submitting the IDEX proposal. Finally, even if all members of the PRES are not founders of IC West, the PRES play a key role in carrying/promoting a driving effect to the whole RES of Western France.

1.4. GOVERNANCE, MONITORING PROCESSES AND FINANCIAL ASPECTS OF IC WEST

The governance of IC West aims at reaching maximum efficiency and agility. Firstly, to let actors of IC West concentrate on their real objectives, with the minimum of overhead. Secondly, because IC West will be an “experimental laboratory” for the emergence of a new, decentralized university system, and therefore, its governance has to be as flexible as possible to adapt to the numerous foreseeable changes of the next decade.

Agility is also needed to let the communities of IC West – in the Departments of Excellence, but also beyond these Departments – react as quickly as possible to the emergence of new concepts, new technologies, and new ideas, and be able to mobilise their forces on new issues by reconfiguring cooperation projects unhindered by unnecessary delays. Actually, this will be a

specific challenge of IC West to invent new modes of “scientific governance”, allowing “zero-overhead” for projects: the rapid spread of social networks usage for research is, for example, acknowledged by the *Comin’Labs* excellence laboratory, which proposes to study and create the necessary tools and practices required to reach efficiency in cooperation.

To reach efficiency and agility, IC West will have a strong strategic and operational capacity based upon a simple governance, a strategic road map for the full IDEX, financial resources oriented towards focused actions of the excellence perimeter in priority, a strong autonomy of the Departments, and finally, a strong and agile bottom-up innovation process of the scientific community. More precisely, IC West will have the status of a *Fondation de Coopération Scientifique* (FCS), with a Governing Board (of 20 members) and a Strategic Committee. An executive committee of 10 members will be organised around an executive director, in direct relationship with the Departments of Excellence and with the IC West centres dedicated to specific transverse tasks of IC West. The Governing Board will be assisted by a financing committee and an audit committee.

Departments will be created by decision of the Governing Board, upon presentation of a strategic project that shows how the Department proposes to reach the main missions assigned by IC West. When created, a contract of objectives and means (COM) is signed between the Department of Excellence and IC West. All contributing institutions of the Department sign this COM which defines their contribution in terms of financing, human resources, and more generally, by means of commitment towards the mobilisation and achievement of the Department objectives. In particular, the COM should mention explicitly which institution recruits the personnel needed by the Department.

The excellence perimeter will concentrate 80 % of the total resources, among which 60 % will go to axis 1 of priority 1 "Strengthening the Departments, in an international perspective". Total requested funds amount to 738,881 million euros.

2. DETAILED DESCRIPTION OF THE PROJET – PRÉ-SÉLECTION PHASE

2.1. AMBITION AND STRATEGY

IC West is an innovative research and higher education network of excellence thematic Departments, organised in Brittany and Pays de la Loire. IC West goal is to support four main excellence fields in research, education and innovation and establish them as world-class institutes that will be strong research attractors on the international scene. This precursor project will contribute to creating a unique, original, outstanding, and attractive place for education, research and innovation in the West.

IC West intends to significantly contribute to the national effort in addressing major scientific and societal issues through the inter-disciplinary research conducted in the four excellence departments. They include:

- The impact of climate change on biodiversity and ocean behaviour
- The development of personalised medicine
- Tomorrow's digital environments at the service of the citizen and trans-disciplinary applications
- Performing co-conception products/processes for a competitive and "0-carbon-emission" industry.

This ambition builds upon two models that inspire our reflections and are at the core of our project:

- The University system model, as implemented for example by the University of California, Quebec University, or University of Maine System. IC West prefigures the emergence of such a research and education system in Western France, based on four fields of excellence. Eventually, this will lead to the creation of a decentralized networked university system in the two regions.
- The Japanese World Premier Institute (WPI) model established in 2007, with the reference of the Advanced Institute for Materials Research Institute at the University of Tohoku. This model inspires the Departments of Excellence that are the core of IC West.

The proposal presented here significantly differentiates from the first IC West project submitted in January 2011. Taking into account the outcome of the first call for proposal, it capitalizes on the initial results of the excellence initiative of the two regions to build a new, focused, and original project.

2.1.1 IC WEST, AN EXPERIMENTAL DECENTRALIZED HIGHER EDUCATION, RESEARCH AND INNOVATION SYSTEM BASED ON FOUR KNOWLEDGE DOMAINS, ADDRESSING MAJOR SCIENTIFIC AND SOCIETAL ISSUES

The research and higher education system (RES) in Brittany and Pays de la Loire is characterised by its natural localisation over several places: mainly Rennes, Nantes, Brest, Angers, Le Mans, Vannes, and Lannion. This organisation reflects the historic and the geographic arrangement of our regions. Our higher education system is recent: for its main stream, it dates back to the 1960s; some of its parts are almost “new” (for example, *Université de Bretagne Sud* was created only 15 years ago). In spite of its youth, it is already a very significant element of the French RES, and its contribution, in research, education and innovation is very visible, in France, Europe, and for certain aspects, worldwide.

Brittany and Pays de la Loire together combine numerous assets to become soon one of the most dynamic and attractive areas in Europe, as far as innovation is concerned. The demographic dynamics of Western France is in itself a strong factor of development. In terms of research and higher education, Western France is characterised by a constant increase in scientific achievements. The increase in scientific production has, for example, been acknowledged by the recent evaluation by the AERES of its laboratories and institutions. Moreover, the academies of Brittany and Pays de la Loire have been, for years, among the top 5 French regions in terms of number of students receiving the French *baccalauréat* qualification, and they are very close to reaching the Lisbon objective of 80% students entering higher education.

Among the reasons for such success, two are dominant. The first one is the ability of our institutions – universities, *grandes écoles*, research organizations, companies – to build research and innovation projects organised as networks: by networks, we mean groups of people belonging to different, possibly geographically separated, institutions, who organise themselves to focus on a common research, education, or innovation problem and to cooperate to bring solutions to this problem. The second one is the strong links that exist between the “academic” aspects of the RES and its economic and societal counterparts: this is, for example, reflected by Western France’s very high success rate in terms of the IRT, IHU, IEED and SATT call for proposal of the “*Investissements d’avenir*”, a result placing our region as the leading region in France in this respect.

These are the reasons why all actors of the Western France RES decided, about two years ago, to respond together to the “*Initiative d’Excellence*” call for proposal, which resulted in the first IC West project. This decision led to an unprecedented common effort to put forward the excellence perimeter of our regions, and to define precisely what our differentiating contribution would be.

Bretagne and Pays de la Loire demonstrate excellence in research, higher education, and innovation in numerous fields: Sciences of the Ocean, Information and Communication Sciences, Materials Sciences, Health Sciences, Agronomy, Environmental Sciences and Social

and Human Sciences. These fields have reached various levels of maturity, regarding criteria such as critical mass, international visibility, research structuring, and intensity of relationship between higher education, research, and the business sector. As a priority, IC West naturally aims to boost established excellence in research, innovation and education in order to make these excellence fields and their associated geographical sites visible, attractive, acting as major players in research at an international level. IC West also intends to respond to major national and international scientific, economic and social issues related to the fields in which it excels.

Doing so, IC West will contribute to the emergence of real “university system” over the two regions. Given IC-West’s specificities, i.e. (i) a vast territory covering two regions (Brittany and Pays de la Loire), (ii) around 20 higher education institutions (including four research national institutes, seven universities, several *grandes écoles* and major research centres) and (iii) the large number of researchers and students involved, its vision for the next 5- to 10-years is to set up the conditions for the emergence of a federated and networked university system – as per the current North American university system. The aim is to foster the regions scientific development so that it benefits not only to local citizens, but also to the economic stakeholders involved (through various training programmes led by internationally renowned trainers and research- and innovation-activities, respectively).

The created RES system will take its inspiration from the California University, Quebec University or the University of Maine System. As the unique emblem of all the partners involved, it will be based on shared values, ambitions and resources, with governance tailored to the French higher education system with respect to the specificities of each of the partner establishments.

2.1.2 DEPARTMENTS OF EXCELLENCE: A STRUCTURING MODE FOR THE INTEGRATED DEVELOPMENT OF EXCELLENCE IN EDUCATION, RESEARCH AND INNOVATION

IC West shall build its organisation on the concept of Departments of Excellence. They regroup research teams at the best international level, addressing major scientific and social issues through ambitious scientific projects. They also carry high-level research-based curricula, and invest in close relationships with companies and the socio-economic world. The goals assigned to Department of Excellence are the following:

- Developing research of utmost quality, comparable to the best research centres worldwide
- Becoming “research hubs” capable of attracting some of the best researchers on the topics they consider
- Creating an open innovation space for research, higher education, and science-society relationship development
- Offering international standard best research environments in terms of infrastructures, working and living conditions.

By nature, Departments have an interdisciplinary character, since they aim at answering essential economic and social issues; they have a strongly focused scientific theme; and they

are of limited size (of the order of 500 permanent faculty and researchers). They are placed in excellence niches, and they try to reach critical mass on their target field. Researchers of the Departments of Excellence of IC West will form what we call *IC West Community*.

Departments of Excellence will be the core of the experiment consisting in the establishment of the Western “networked university system”, as they are already experiencing this organisation over the two regions, bringing together research teams that belong to different sites for various projects over the years.

IC West will emphasise the development of the Departments at the international level, by favouring the construction of strong and privileged relationships with a small number of world-level reference institutions. The idea is to constitute, in each chosen domain, a tight network of the best institutions worldwide. The excellence departments will also guarantee preferential access for students, especially those in Master and PhD degrees, as they aim at developing a high level research-based education.

The relationships between Departments of Excellence developed within IC West and the created networked university system could be like those established between Tohoku University and the World Premier International-recognized Advanced Institute for Materials Research (WPI - AIMR), which retains a great deal of autonomy in its governance and scientific policy.

Departments of Excellence will enjoy a strong autonomy both in terms of operational management and objectives definition. They will, however, be linked to IC West through contracts of objectives and means (COM) that will detail their strategic project, their quantitative and qualitative objectives over 4 and 10 years and the way they will use IC West funding to implement these goals. IC West will organise the coordination of the Departments operation through the presence of a delegate direction, in charge of helping the head of Department to concentrate on the Department strategic orientations and freeing him/her from organisational tasks.

More specifically, based on their strategic projects, Department of Excellence will have to report to IC West governance on: their capacity of achieving international visibility (focused critical mass, quota of foreign researchers reached after 4 years, and developing joint projects with world level research teams, etc.); their impact on research (emergence of new research domains and of new paradigms, level of publications), on society (capacity to transfer some knowledge to the economy, answers to new societal challenges), on the evolution of practices (innovation in carrier management); all this by making a good use of the resources offered by IC West.

Although we can foresee what the initial Departments of Excellence of IC West will be, we will define keys for analyzing the maturity of potential fields based on these criteria. These keys will be finalised at the beginning of IC West by its Governing Board and its Strategic Committee, and

they will both play a central role in validating our initial choice, creating new Departments of Excellence and monitoring their successes and evolutions over time.

2.1.3 IC WEST PERIMETER OF EXCELLENCE BASED ON A POTENTIAL OF FOUR DEPARTMENTS OF EXCELLENCE, AND SCHEDULED TO EVOLVE IN THE FUTURE

The excellence perimeter of IC West builds on four thematic fields of which the quality of research, the critical mass, and the organisation are most recognised at the international level. Our rationale in defining the excellence perimeter is twofold. Firstly, the excellence perimeter is based on the identification of core Departments of Excellence, as defined above. Secondly, it is grounded on the presence of “excellence bricks”, i.e. projects that have been selected in the framework of the “*Investissements d’avenir*” programme. More precisely, we consider that a Department of Excellence must be supported by at least one Laboratory of Excellence and one Institute of Excellence (IRT, IEED or IHU).

With these requirements, the excellence perimeter of IC West has today a potential of four Departments of Excellence.

The 21st Century Ocean, with the Labex *Mer* and the *France Energies Marines* IEED. This Department encompasses marine sciences and technologies proper. The science programme addresses key questions as regards the crucial role of the ocean in regulating global warming, the impacts of global change on biogeochemistry, biodiversity and marine resources, the deep ocean and the exploitation of mineral resources, and the challenging role of coastal zones at the interface between land and sea in the perspective of sustainable development.

ICST (Information and Communication Science and Technologies) - Challenges for a citizen digital society, with the *Comin’Labs* Labex, and the *B-Com* IRT under consideration. This department addresses the challenges generated by the growing complexity of communication and information systems, at the heart of so many societal issues. Interdisciplinary approaches, letting researchers from quite different domains cooperate (potentially from the component level up to the user, involving transport as well as networks issues and over-the-top applications) will be privileged. Applications span a large area, but the department intends to focus on few challenges (digital environments, ICT for personalized health, security and privacy in ICT, user centric images and media of the future, Social networks, energy efficiency, "neural" coding).

Materials Science and Engineering, with the *Jules Verne* IRT, the national Labex *Storex* and two Labex projects (*Factory* and *Double Command*) submitted to the second call for proposals. It concerns materials, mechanics and processes, the engineering of molecules, materials and instrument innovation. It addresses issues of clean mobility, production and storage of decarbonated energies, of reliability-security, of management of materials end of life. These subjects have important economic and scientific stakes, in an approach that goes “from the molecule to the object fabrication”, or the product-process co-design.

Biomarkers & Biotherapies, with a “promising” IHU, several cohorts and health platform projects, and two Labex proposals (*IGO and GCV*). This domain addresses major societal stakes such as personalised medicine, or the development of innovating biotherapy methods. In this respect, a main goal of this department will be to accelerate the identification of new biomarkers and new therapeutic targets, through the development of innovating, integrated, standardised screening strategies and of large biomedical applications.

With this initial choice, IC West excellence perimeter will concern about 1,300 academics within 4 excellence fields. Through their research activity and strategic projects in terms of innovation and higher education, IC West intends to address major scientific and societal questions.

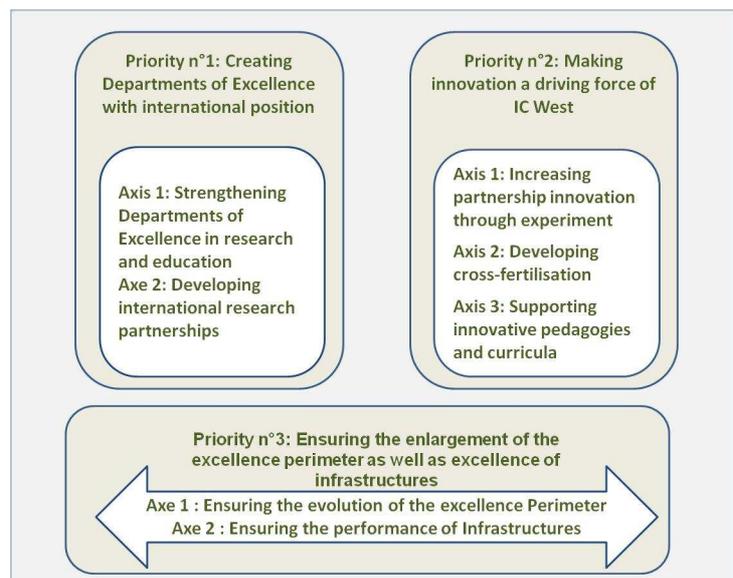
This perimeter constitutes a significant force at the European level, and at the same time, a focused effort of our research capabilities. Results of the pending Labex call for proposals will confirm the inclusion of those domains in IC West excellence perimeter after decision by the Governing Board of IC West. For domains that will not be retained initially, maturation actions will be undertaken (Priority no. 3 of IC West) with the perspective that they enter the excellence perimeter at the end of the first 4 years of IC West.

Other domains such as Agronomy do not fulfil the minimum conditions to constitute Departments of Excellence today. Efforts needed to reach these conditions will be pursued outside IC West, within the L’UNAM and UEB PRES. However, these domains will benefit from IC West actions aiming at creating a driving force for the whole RES. They will possibly enter the excellence perimeter of IC West later on, after the first 4 initial years. Moreover, domains where a Laboratory of Excellence is selected at the end of the second call for proposals will be considered as candidates of choice for the actions of IC West.

2.1.4 THE STRATEGIC PRIORITIES OF IC WEST AND RELATED ACTIONS

IC West has three strategic priorities:

1. Priority n° 1: Creating Departments of Excellence with international position;
2. Priority n° 2: Making innovation a driving force of IC West;
3. Priority n°3: Ensuring the enlargement of the excellence perimeter as well as the excellence of infrastructures.



These priorities are oriented towards two different targets: the excellence departments and the whole RES community of Western France. To reach these goals, IC West has built a portfolio of 12 targeted actions.

A large part of actions, especially those dedicated to the reinforcement of strategic projects and international position of the Departments of Excellence will be implemented through contracts on objectives and means (COM) linking Departments of Excellence and the strategic governance of IC West, thus giving some autonomy to the Departments in the allocation of IC West funds as long as this is done in coherence with the terms of the COM based on their strategic project.

2.1.5 THE GOVERNANCE OF IC WEST: EFFICIENCY AND AGILITY

The governance of IC West is geared towards the maximisation of efficiency and agility: its primary purpose is to allow the scientific community to focus on its main goals, namely, developing research and teaching, and creating innovation.

The governance will be organised around a Governing Board comprising 20 members, in charge of taking the strategic decisions. The members of the Board will be either direct representatives of the main participating institutions, or indirect representatives through the PRES members. One third of the Board will be made up of members external to the institutions belonging to IC West.

A Strategic Committee of 10 external members will provide recommendations on the overall orientations of IC West on an annual basis.

Each of the Departments of Excellence will define its own organisation, approved by the governance Board as part of its strategic project. IC West will hire for each Department of Excellence a delegate director in charge of the operational relationship between the Department and IC West, thus ensuring that all Departments have coordinated administrative support.

IC West will hire an Executive Director, who will organise the operational structure of IC West together with the delegate directors of the Departments of Excellence.

Among its tasks, the operational part of IC West will have to organise the evaluation of the submitted projects by a pool of external experts (IC West has chosen not to have a scientific committee, in order to increase the agility of the whole decision process). This evaluation will follow specific ethic rules approved by the Governing Board.

In addition to these structures, transverse activities (such as digital development, teaching mission, international mission) will be organised using a classical project approach, under the responsibility of the operational committee.

2.1.6 TOWARDS A TRANSFORMATION OF THE RESEARCH AND HIGHER EDUCATION SYSTEM IN WESTERN FRANCE

IC West will contribute to the accelerated integration of institutions into the IDEX. This integration process relies, first, on how the institutions will be structured into Departments of Excellence in relation to the missions core pillars of research, training and innovation. Then it depends on the development of a highly integrated management device for (i) standardisation of the main cross-cutting processes or (ii) the creation of shared facilities. This will mainly cover:

- IDEX governance and the implementation of a unified governance information system,
- IDEX communication and publication policy, which will be standardised and integrated,
- HRM between the different institutions, which will need to be harmonised and integrated,
- IDEX overall financial management to be unified.

Finally, even though integration is not based on an institution merging scheme, it should result in strong effects compared to the current situation, which is too fragmented.

Through this integration process, IC West pursues the long-term goal of setting up the conditions for the emergence of a decentralised, networked university system in Western France. This process will be based on a pragmatic approach of convergence among the two PRES, L'UNAM and UEB, which constitute the natural place of elaboration of such a project. This convergence will progressively increase the integration of the higher education systems of both regions through the sharing of best practices and through a progressive integration of their activities. Taking into account the actual status of our regions RES, this project constitutes therefore a road map towards the achievement of this goal, rather than an artificial description of the structure of such a hypothetical "University of the West".

Our pragmatic approach considers three main aspects:

- The emergence of Thematic Poles organising research, education and innovation based on the experiments of the Departments of Excellence
- The organisation of common doctoral schools
- The organisation of a numeric campus for both regions.

As a result, we will organise the convergence of the structure of both PRES. This process will lead to a merger of both PRES and to the creation of a new organisation covering the Western region within the first 4 year period.

2.2. STRUCTURE AND CHARACTERISATION OF THE INITIATIVE OF EXCELLENCE

2.2.1 PRESENTATION OF THE PROJECT LEADER (INCLUDING LEGAL STATUS)

IC West is presented by a consortium made of the following institutions: UEB and L'UNAM PRES, and national research agencies INRIA, IFREMER, CNRS and INSERM. This constitutes a new step in the organisation of the research and higher education system in Western France.

The creation of UEB and L'UNAM PRES, four years ago, was an important step towards the federation of the main higher education institutions and research organisations in Brittany and Pays de Loire. PRES have, in particular, made possible the development of relations between universities and *grandes écoles*.

IC West is now a unique opportunity to engage towards a new organisation of RES at the scale of the two regions, a prerequisite to reach a minimal critical size and visibility, by federating the members of both PRES. This approach will soon lead to a merger of the PRES. IC West is also an opportunity to strengthen the partnership between higher education institutions and national research agencies, that will bring a decisive power and visibility in research. This is the reason why INRIA, IFREMER, CNRS and INSERM are co-bearers of the consortium submitting IC West proposal, and co-founder of it.

Finally, even if all members of the PRES are not founders of IC West, the PRES play a key role in carrying a driving effect to the whole RES of Western France.

Presentation of PRES UEB

The *Université européenne de Bretagne*, or European University of Brittany (UEB), was created in March 2007. It is an *Etablissement public de coopération scientifique* (EPCS – Public Scientific Cooperation Institution).



UNIVERSITÉ
EUROPÉENNE
DE BRETAGNE

Combining 23 higher education and research institutions all over Brittany (universities, *grandes écoles*, research structures and hospitals), the UEB is the result of a long partnership between different structures of Brittany higher education network. The creation of UEB, and its certification by the French government, demonstrates the wish of its members to pursue collaborations between the higher education structures of Brittany. It comprises 9 founding members: the 4 universities located in Brittany and 5 *grandes écoles* (Agrocampus Ouest, *École nationale supérieure de chimie de Rennes*, *École normale supérieure de Cachan* - antenne de Bretagne, *Institut national des sciences appliquées* (Insa) in Rennes, and TELECOM Bretagne).

UEB offers a wide range of skills such as research, doctoral training and studies, technology transfer and innovation (in Europe and internationally), organization of observatories to monitor student integration into working life, digital activities, life-long learning, etc.

**APPEL A PROJETS
IDEX
CALL FOR PROPOSALS
IDEX 2 | PRE-SELECTION
PHASE**

**Acronyme du projet / IC
West**

**DOCUMENT DE SOUMISSION /
SUBMISSION FORM**

The aims of UEB are to build a framework for higher education, keeping in mind growing international competition, to develop a shared research strategy and to bring together human and material means in order to develop projects which will enjoy European, and/or international prestige. UEB coordinates the UEB-C@mpus (digital campus programme).

Presentation of PRES L'UNAM



L'UNAM was formed in 2009 as a public institution of scientific cooperation and has 11 founding members – the three universities of Nantes, Angers and Le Mans, *École Centrale de Nantes, École des Mines de Nantes, Agrocampus Ouest, Oniris, CHU de Nantes, CHU d'Angers, Groupe ESA, Audencia Nantes* – and 18 associated members. L'UNAM aims to bring together the regional entities, to establish a common research strategic plan, to identify the scientific productions under the same label, to promote the quality of doctoral training and doctoral students integration into employment, to conduct international projects jointly.

Presentation of INRIA

INRIA was founded in 1967. With a resolutely international outlook, INRIA contributes to the global profile of computational sciences. Convinced that the future of our societies lies in digital technology, INRIA tackles research subjects crucial to the social issues of today. INRIA helps to bolster the competitiveness of the economy in a sector that creates a large number of jobs. Its policy of partnerships with industry and SMEs illustrates its proactive approach to technology transfer. INRIA is also committed to opening access and sharing data. The Institute is also involved in the field of freeware. INRIA is an important contributor to IC West through its Rennes Bretagne Atlantic centre which includes 82 researchers. It is also an important support to the *Comin'Labs* Labex.

Presentation of IFREMER

Created in 1984, IFREMER is a public institute of industrial and commercial nature. It is placed under the joint supervision of the ministry for Higher Education and Research, the ministry of Ecology, Sustainable Development, Transports and Housing, and of the ministry of Agriculture, Food, Fisheries, rurality and of town and country Planning. IFREMER contributes to knowledge about the oceans and their resources, the monitoring of marine and coastal zones and the sustainable development of maritime activities. It designs and operates observational, experimental and monitoring tools and facilities and manages the French ocean research fleet for the whole of the scientific community. 16 research departments are located in the geographic area of IC West project. 2/3 of IFREMER staff (for a total of 1,600 staff) is located at Brest, Nantes and attached littoral stations. IFREMER is an important partner of the Labex *Mer* and coordinator of Equipex *NAOS* and IEED *France Energies Marines*.

Presentation of CNRS

Founded in 1939, the *Centre National de la Recherche Scientifique* (National Center for Scientific Research), CNRS, is a government-funded research organisation, under the

administrative authority of France's Ministry of Research. As the largest fundamental research organisation in Europe, CNRS carries out research in all fields of knowledge, through its seven institutes (Biological Sciences, Chemistry, Ecology and Environment, Humanities and Social Sciences, Information Sciences and Technologies, Engineering and Systems Sciences and Physics) and three national institutes (Mathematical Sciences, Nuclear and Particle Physics, Earth Sciences and Astronomy). Currently, 35 laboratories are recognized by CNRS in the field activities of IC West.

Presentation of INSERM

Founded in 1964, the French National Institute of Health and Medical Research (INSERM) is the only public scientific and technological institute that operates under the joint authority of the French Ministry of Health and the French Ministry of Research. In 2008, INSERM took on the responsibility for the national strategic, scientific and operational coordination of biomedical research. From the outset, the Institute has forged close partnerships with other public and private research establishments as well as hospitals to fulfil its missions. 80% of INSERM's 318 research units are currently set up in university hospitals or cancer research centres. INSERM plays a leading role in creating the European Research Area and boosts its standing abroad through close partnerships (teams and partner laboratories abroad). Currently 22 research units are recognized by INSERM in the field activities of IC West.

2.2.2 HIGHER EDUCATION, RESEARCH, AND INNOVATION IN BRITTANY AND PAYS DE LA LOIRE

The demography of Brittany and the Pays de la Loire is changing rapidly. The two regions combine metropolitan areas on a human scale with an attractive habitat which respects the environment. They have two key advantages for setting up an ambitious and realistic IDEX.

Firstly, both are among the top 5 regions in France based on a variety of indicators. With their alliance, these two regions tap a potential of more than 4,000 researchers and research professors in A and A+ laboratories, as illustrated below, over 6 main thematic fields.

Brittany and Pays de la Loire represent all together² :

- 224,000 students, which makes them the third largest regional concentration in France,
- 27,380 full time people in research in 2008 in both regions (3rd position), 7,000 in the public sector (4th position). 2,430 faculty members and researchers are publishing researchers, of which 3,320 are in research units ranked A+ or A (AERES 2007),
- 8,136 Master graduates in 2009 (4th position),
- 967 Doctoral graduates in 2009 (3rd position).

Secondly, both regions have a long-standing tradition for co-operation in both scientific research and innovation. They know how to combine their potential to obtain optimal impacts.

² Figures quoted in the report "OVERVIEW of the sites where "IDEX" applications are taking place", MESR, February 2011.

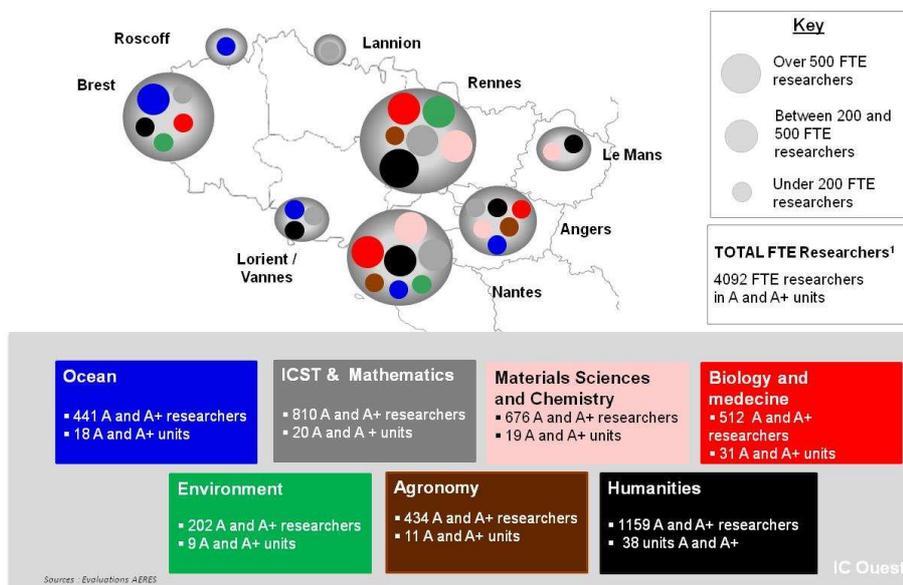
**APPEL A PROJETS
IDEX
CALL FOR PROPOSALS
IDEX 2 | PRE-SELECTION
PHASE**

**Acronyme du projet / IC
West**

**DOCUMENT DE SOUMISSION /
SUBMISSION FORM**

This potential of excellence, combined with close inter-regional co-operation, provides a sound foundation for the Brittany-Pays de la Loire IDEX. This momentum is one of the driving factors behind the regions strong national growth in scientific publications across all disciplines (up 12% between 2001 and 2007, 6,400 publications in 2008). Overall, the potential of excellence is estimated at 2,571 researchers and research professors working on Labex projects, and a potential of 4,092 researchers and research professors within A and A+ laboratories, as illustrated by the following map. The scope of excellence in research and higher education demonstrates a very strong scientific potential, and it constitutes an equally strong basis for the emergence of integrated Departments of Excellence. In fact, such a potential has already been acknowledged by the success of our two regions in the various projects of the “*Investissements d’avenir*” calls for proposals.

A and A+ Laboratories and researchers in Brittany and the Pays de la Loire



7 competitive clusters are also located across both regions: Mer, Images & Réseaux, EMC², ID4CAR, Valorial, Atlanpole, Biothérapies and Végépolys. They cover the whole scope of the Departments of Excellence. Biogeneouest, a network of platforms for the life sciences, associates five *grandes écoles* and universities, hospitals, and 8 major organisations (ANSES, CNRS, IFREMER, INRA, IRD, INRIA, INSERM, IRD).

Since socio-economic actors consider that too many interface structures exist, and since they stress the difficulty for the partnership policy to be read, IC West governance must improve the existing situation and offer an interface that acts as a centralized single economic stakeholder.

IC West will then contribute to defining a comprehensive strategy for relations with the socio-economic sphere and the dissemination of knowledge, and improve technology transfer, based on the services offered by the SATT West Valorisation, the company for accelerated technology transfer from public research, common to Brittany and Pays de la Loire. In IC West, a direction

**APPEL A PROJETS
IDEX
CALL FOR PROPOSALS
IDEX 2 | PRE-SELECTION
PHASE**

**Acronyme du projet / IC
West**

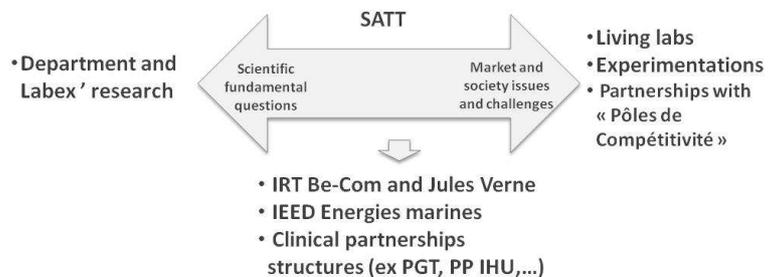
**DOCUMENT DE SOUMISSION /
SUBMISSION FORM**

of the partnerships will operate this strategy by leaning on services offered by the SATT West Valorisation.

With strong expertise and substantial resources, West Valorisation combines proximity and responsiveness, necessary to transform the innovation potential of public research into economic value. It manages the intellectual property of researchers work, the maturation of innovative projects, technology transfer and research partnerships with companies to address societal challenges while ensuring profitability to its shareholders. It now includes Western institutions represented by the UEB and L'UNAM PRES, as well as three national research organizations (CNRS, INSERM, IRD) around a tight governance, which may be expanded in the future.

IC West will help sustain excellence in R&D in particular for SMEs. For too many of these, innovation is still very limited (only 15% carry out R&D although the number of patents filed has increased by almost 40% in 10 years). In 2021, the business plan includes an annual flow of 71 projects maturation from 180 invention disclosures, the signing of 29 licenses and the negotiation of more than 1,000 research contracts per year (pre-tax profit of € 4.8 million for a turnover of € 32.7 million).

The link between public science and the economic and societal sphere is supported by a double approach based on “techno pushed” and “market pulled” innovations



IC West will also enable the development of interdisciplinary programs. The interface between different fields is often where breakthrough innovation appears, often when laboratories and companies work together. Thus a large budget will be allocated to fund projects conducted with companies in order to double the number of stock CIFRE PhDs under the Priority n°2 of IC West “To make innovation a driving force of IC West”.

Moreover, collaboration with clusters and technology parks will be favoured to facilitate exchanges between actors and promote the vocational integration and recognition of the Masters and Doctorates by companies. Incubators backed by technological parks will have a special role to play in supporting the creation of new SM from research programs and from innovative technologies of the IDEX.

IC West will fund international chairs for foreign scientists developing R&D in or with companies as well as support the mobility of researchers of the IDEX to industrial centres of excellence abroad. The IDEX will support partnerships with some companies that are considered strategic for its presence on the international stage, in its perimeter of excellence.

**APPEL A PROJETS
IDEX
CALL FOR PROPOSALS
IDEX 2 | PRE-SELECTION
PHASE**

**Acronyme du projet / IC
West**

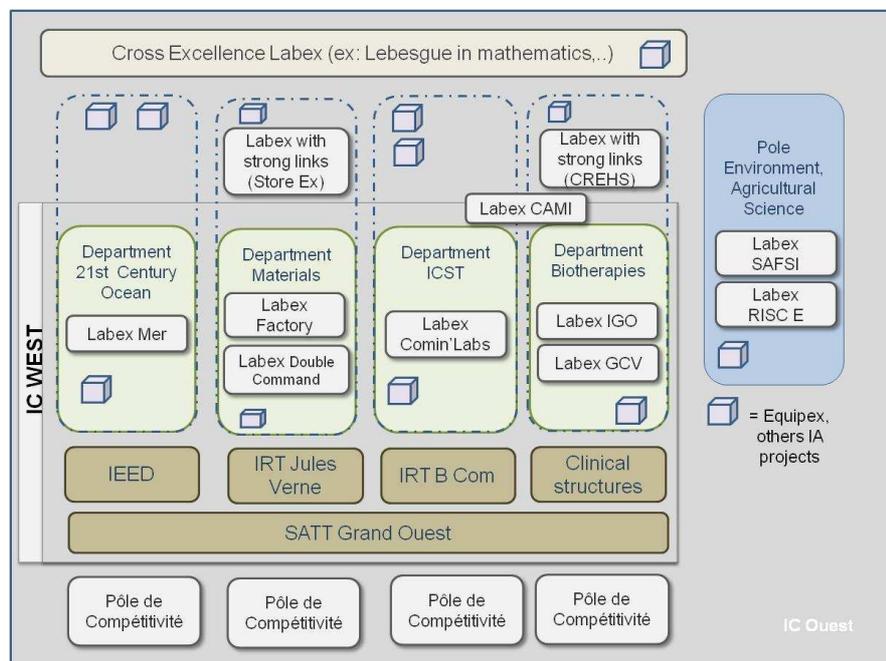
**DOCUMENT DE SOUMISSION /
SUBMISSION FORM**

2.2.3 APPLICATION TO THE ACTIONS OF THE PROGRAMME "INVESTISSEMENTS D'AVENIR"

Both PRES, UEB and L'UNAM, jointly coordinate the actions carried out within the "Investissements d'avenir" programme. They set guidelines, prioritise projects and support the project carriers. In most cases, one of the two PRES registers the project on behalf of the regional institutions involved. This set-up enables the projects to be linked together and then to be integrated into the IC West excellence initiative as a whole.

The overall picture is based on several large scientific domains that share the following characteristics:

- They are multidisciplinary, dealing with scientific challenges to address major societal issues
- These domains are built and managed in close cooperation with the economic community through close relationships with the institutes of excellence (IRT, IEED, IHU) and the competitiveness clusters
- These domains are the location of an integrated approach to research, training and innovation.



As far as IC West is concerned, this organisation, as shown in the figure hereunder, highlights the reasons behind IC West choice to focus on specific topics:

- Some fields, such as the agronomy, are not part of the original IDEX excellence perimeter because, at present, they lack structuring and have little international presence
- Some Labex projects, such as *Storex* or *Santé et nucléaire* are not part of the IDEX excellence perimeter even though the field itself is included in the IDEX. This is because this Labex research line is too far from the IDEX's core issue, or because the Labex is part of a national network that does not fall under the West region governance.

The Labex proposed in this second call for tender (as well as other "Investissements d'avenir" projects such as Equipex or Demonstrators) have been designed as strategic elements to structure higher education and research within the UEB-L'UNAM inter-regional area. In the long run, this should mobilise most of the researchers within the major research fields (e.g., Ocean,

**APPEL A PROJETS
IDEX
CALL FOR PROPOSALS
IDEX 2 | PRE-SELECTION
PHASE**

**Acronyme du projet / IC
West**

**DOCUMENT DE SOUMISSION /
SUBMISSION FORM**

Information and Communication Science and Technology (ICST), Materials, Health, Agronomy, Environment, etc.) and cross-cutting research topics (e.g., Humanities), all with an indisputable visibility on research, education and relationships with the business community.

Our strategic choices mean that, among these fields, only four are will be eligible to be, on T₀, as founding members of the Departments of Excellence. They are in strong synergy with the stakeholders from the business community, such as (i) Institutes (those already selected, i.e. the *Jules Verne* IRT and the promising *TSI-IHU*³ new project; those under the assessment procedure, i.e. *B-Com* IRT and *France Energies Marines* IEED), (ii) the SATT West Valorisation (under the assessment procedure), (iii) the competitiveness clusters (*Images and Networks*, *Mer*, *EMC2*, and *Atlanpole Biothérapies*). Departments of Excellence will have, in the long run, the authority to integrate new “bricks of excellence” out of the IDEX framework.

The four Departments of Excellence proposed have, thus, been narrowed down to the following research fields: the 21st century Ocean, Information and Communication Science and Technology (ICST), Materials Science and Engineering, and Biomarkers and Biotherapies. They address the main scientific and societal challenges under study within the 6 Labex (*Mer and Comin'Labs* - already selected - ; *Fabric*, *Double Command*, *IGO* and *GCV* - submitted to the second call for proposals) and involve A- or A⁺-ranked laboratories together with a small number of researchers.

Projects submitted to “*Investissements d’avenir*” for the 4 Departments of Excellence of IC West are displayed on the following pages.

³TSI-IHU: The University Hospital Institute (the “European Centre for Transplantation Sciences and Immunotherapy”)

**APPEL A PROJETS
IDEX
CALL FOR PROPOSALS
IDEX 2 | PRE-SELECTION
PHASE**

**Acronyme du projet / IC
West**

**DOCUMENT DE SOUMISSION /
SUBMISSION FORM**

21st Century Ocean Department of Excellence

New projects submitted :

- Equipex GOLD (carrier UBO / UEB, participation of Universities/CNRS)...: deep drilling project in the Mediterranean Sea (technological development)
- Equipex Bathytron (carrier UBO / UEB, participation CNRS / INEE, UMPC, ...): mechanism for growth of bacteria under high pressure and temperature
- Equipex EM3OCAN (carrier IFREMER, participation other universities...): development of sensors for ocean monitoring satellite
- Equipex EVOLUTION (carrier ECN / L'UNAM): extension and improvement of capabilities of the basin swell of ECN for the study of naval hydrodynamics and marine energy
- Pre-industrial demonstrator DéfiμALG (carrier Atlanpole / L'UNAM, participation U. Clermont, CEA): process optimization for the production of fuels from microalgae

Participation in projects whose carriers are out UEB and UNAM:

- Equipex EMSO Ligure (carrier U. Mediterranean): development of a seafloor observatory in the Ligurian Sea
- Equipex SISDAV (carrier Ifremer Fleet National UMS) : development of the future science in seismic
- Equipex Mineral Resources Department Funds (carrier Ifremer Fleet National UMS): high-resolution exploration
- Equipex RIMA (carrier CNRS / INSU) : national network of platforms for marine type mesocosms
- Equipex CRITEX (carrier IPGP) : innovative fleet of innovative equipments for the study of spatial and temporal Critical Watershed Zone
- Equipex SETHI-NG (carrier ONERA): development of measures for remote sensing radar and optronics

Projects under evaluation

- IEED France Energies Marines (coordination Ifremer, participation of UEB, L'UNAM and others) : project pre-selected that aims to pool the efforts of research centers, public and private companies, to work on the major technological challenges, in particular the technological chain of marine renewable energy: offshore wind, ocean currents, waves and ocean thermal energy

Information and Communication Science and Technology Department of Excellence

New projects submitted

Equipex VERTEX (UEB coordination, with other partners) to build a high end virtual reality equipment essential to address a single scientific question: how to better provide a natural and immersive multimodal interaction within virtual worlds?

Project with strong links with this department

Labex LEBESGUE (Carried on by UR1/UEB, partner UN / L'UNAM, CNRS) : research in geometry, analysis, statistics & probabilities

Projects under evaluation

IRT-B COM (portage Orange and UEB): project pre-selected at the intersection of technology and networks, content, practices and services that aims to position itself as a world leader in the "digital future" by dedicated to technology immersion and hyper connexion, fixed networks and mobile ultra high-speed images of the future (ultra-high definition, augmented and virtual reality).

Materials Science and Engineering Department of Excellence

New projects submitted

- Labex DOUBLE COMMAND (carrier UEB, participation L'UNAM): involves researchers in physics and chemistry of matter and materials (IMN evaluated A, SCR evaluated A + and IPR evaluated A, Moltech Anjou evaluated A) to control the response of matter at ultra-fast and ultra-small scales, with the objectives of innovation and technological applications for innovative materials, the manipulation and understanding of controlled advanced

**APPEL A PROJETS
IDEX
CALL FOR PROPOSALS
IDEX 2 | PRE-SELECTION
PHASE**

**Acronyme du projet / IC
West**

**DOCUMENT DE SOUMISSION /
SUBMISSION FORM**

properties (high speed / electronic / optical) and strategies for shaping materials.

- Labex FACTORY (carrier L'UNAM, participation UEB): brings together specialists in mechanics, acoustics, processes, robotics, cognitive psychology and signal processing of Laum (A +), Larmaur Glass (A), IRCCYN (A +) and GEM (A +) with the challenge to drive process / processes based on knowledge of the material or structure at multiple scales through the development of numerical methods in rupture with conventional methods and new robots or sensors.
- Equipex STURDY (carrier UR1/UEB) for Advanced Studies of Structure and Dynamics of molecules and materials
- Equipex DURSI (carrier EMC2 / L'UNAM) for experimental and numerical simulation of high-performance structural materials.
- Equipex AUDIBLE (carrier U. Maine / L'UNAM) to study the production, propagation, perception of sound and reduce noise pollution

Participation in projects whose holders are out UEB and L'UNAM:

- Equipex PROOF (carrier CNRS-bearer INSIS, participation UR1/UEB) for optics studies
- Equipex Semple (carrier CNRS, participation UEB, L'UNAM) to build a specialized electron microscope platform for electrical energy production and storage studies

Biomarkers and Biotherapies Department of Excellence

New projects submitted

- Labex IGO (carrier L'UNAM, participation UEB): in immunology and oncology, it covers all components of the human immune system in terms basic and clinical, with an original interface with teams in leading oncology and nuclear oncogenesis
- Labex GCV (carrier L'UNAM, participation UEB, Univ. Angers) : in cardiovascular genetics : combine clinical research and basic biology, genetics, physiology; proposes to apply the successful strategy of research in rare diseases (of the patient, to the bench, to the patient) to chronic cardiovascular disease
- Equipex Cryo-EM (carrier UR1/UEB): aims at imaging frozen hydrated biological macromolecules with high spatial resolution
- Equipex ArronaxPlus (carrier GIP ARRONAX/L'UNAM) to develop diagnostics, molecular imaging and therapy with vectorized radionuclides.
- Infrastructure ECCP (European Centre for Stem Cell Production): therapeutic innovation to develop pre-clinical (primates) and clinic.

Projects outside IDEX but closely integrated with the Department "Biomarkers and biotherapy"

- Labex IRON (carrier L'UNAM, Univ. Angers and other universities, national project): to constitute a French cyclotron network for innovation in oncology and radiopharmaceuticals neurology
- Labex CAMI (carrier U. Grenoble, participation U. Strasbourg, U. Paris, U. Montpellier, UBO-UR1/UEB and 6 CHU,: to develop robotic-assisted surgery
- Labex CRESH (carrier UEB) to study environment and health relationships
- Equipex MIHN (carrier INRA- Oniris /L'UNAM, participation UR1/UEB and others universities) to manage endemic infectious animal diseases and veterinary public health risks.
- Infrastructure NUTRIPOLE (carrier INRA / CRNH-Lyon, participation CRNH Nantes/L'UNAM, Clermont and Ile de France) to constitute a network of the four French centers of research for human nutrition (CRHN).

Projects outside IC-West perimeter carried on by UEB or L'UNAM

Agronomy

- Labex SAFSI (carrier INRA/UEB/LUNAM, partners :U. Angers, U. Brest, U. Nantes, U. Rennes 1, AGROCAMPUS OUEST, ONIRIS, ESA, AUDENCIA, EMN, NRA centre d'Angers-Nantes et de Rennes, Ifremer, Cemagref, Anses, CNRS) to study agri-food systems
- Equipex EVE (carrier INRA Bordeaux, participation L'UNAM) to study vineyard ecosystem and environment
- Equipex FOOD-FOCUS (carrier Oniris/L'UNAM, participation UEB) for metabolomic studies
- Infrastructure CRB Anim (carrier Inra, with participation of many institutes among them Oniris/L'UNAM) to

**APPEL A PROJETS
IDEX
CALL FOR PROPOSALS
IDEX 2 | PRE-SELECTION
PHASE**

**Acronyme du projet / IC
West**

**DOCUMENT DE SOUMISSION /
SUBMISSION FORM**

constitute a biobank network for domestic animals

Environment

- Labex RISC-E (carrier UEB) : for multi-scale modeling of risks
- Equipex INTOXICATING (carrier L'UNAM) : national platform analysis

Humanities

- Labex CAMPER (carrier UR2/UEB, participation L'UNAM, U. Caen): to develop a research network campaigns : dynamics of environmental and human issues of rural areas
- Labex IDA (carrier UEB): to develop the Institute of the Americas
- Labex IEA-RFI (carrier IEA Nantes/L'UNAM) : to constitute a world IEA network

Selected Laboratories of excellence

<i>Acronyme du projet / Project acronym</i>	<i>Champ disciplinaire / Field (SIMI,SVSE, SHS)⁴</i>	<i>Nom du coordinateur / Name of the project manager</i>	<i>Partenaire coordinateur / Project leader</i>	<i>Consortium /partenariat impliqué Consortium/ implicated partnership</i>
LabexMER	SVSE	Yves-Marie PAULET	PRES UEB	CNRS - IRD – IFREMER- UBO – Univ. Nantes – Ecole Cent. Nantes – UBS
Comin'Labs	SIMI	Albert BEVENISTE	PRES UEB	CNRS – INRIA – INSERM – UR1 – UR2 – UBO – Inst. Télécom – UBS - INSA Rennes
STORE EX	SIMI	JM TARASCON	CNRS	CNRS, Université de Picardie, Université de Bordeaux, Université de Nantes
MabImprove	SVSE	H WATIER		Université de Tours, Université de Nantes, Université de Montpellier
LaSIPS	SIMI	Philippe BOMPARD	Paris Saclay	Spelec, , ECP, ENS Cachan, U Paris 11, Polytech, EPSCI, Mines Paris, ENSTA Paris Tech, EDF, CEA, Onera

Other Laboratories of excellence presented in the IDEX project, to be submitted to the second Labex call

<i>Acronyme du projet / Project acronym</i>	<i>Champ disciplinaire / Field (SIMI,SVSE, SHS)</i>	<i>Nom du coordinateur / Name of the project manager</i>	<i>Partenaire coordinateur / Project leader</i>	<i>Consortium /partenariat impliqué Consortium/ implicated partnership</i>
Double Command	SIMI	Marc FOURMIGUE	PRES UEB	CNRS – UR1 – Insa Rennes – ENSCR – Univ. Nantes – Univ. Angers -
Factory	SIMI	Francisco CHINESTA	PRES L'UNAM	CNRS – Ecole Centrale de Nantes – Univ. Nantes
IEA - RFIEA	SIMI	Samuel JUBE	PRES L'UNAM	IEA Nantes, IEA Paris, IEA Lyon, IEA Marseille
RISC E	SVSE	Philippe DAVY	PRES UEB	CNRS Univ. Rennes 1, INRA
CREHS	SVSE	Bernard JEGOU	PRES UEB	CNRS – INRA – INSERM – INRIA – ANSES – U1 – UR2 – EHESP – Agrocampus Ouest
IRON	SVSE	François BODERE	PRES L'UNAM	CNRS -Univ. Nantes, Oniris
IGO	SVSE	Marc BONNEVILLE	PRES L'UNAM	INSERM, CNRS, Univ. Nantes, Univ. Angers, Univ. Rennes 1, UBO, Oniris
GCV	SVSE	Hervé LE MAREC	PRES L'UNAM	INSERM, Univ. Nantes, Rennes 1, UBO
SAFSI	SVSE	Patrick HERPIN	INRA	Universities and research centers from UEB and L'UNAM

⁴ SIMI : Sciences de l'information, de la matière et de l'ingénierie / Information, matter and engineering sciences
SVSE : Sciences de la vie, de la santé et des écosystèmes / Life, health and ecosystems sciences
SHS : Sciences humaines et sociales / Humanities

**APPEL A PROJETS
IDEX
CALL FOR PROPOSALS
IDEX 2 | PRE-SELECTION
PHASE**

**Acronyme du projet / IC
West**

**DOCUMENT DE SOUMISSION /
SUBMISSION FORM**

CAMI	SVSE	Eric STINDEL	National ou IHU Strasbourg	Univ. Rennes 1/UEB
Lebesgue center		San Vu Ngoc	PRES UEB	Univ. Rennes 1, ENS Cachan, Univ. Nantes

*Selected Investissements d'avenir projects related to the perimeter of Excellence
(apart from Labex)*

<i>AAP concerné / Call for proposal</i>	<i>Acronyme du projet / Project acronym</i>	<i>Nom du coordinateur / Name of the project manager</i>	<i>Partenaire coordinateur / Project leader</i>	<i>Consortium /partenariat impliqué / Consortium/ implicated partnership</i>
IRT	Jules Vernes	Patrick CHEDMAIL	PRES L'UNAM	ECN, EMN, Univ. Nantes, Univ. Le Mans
PP-IHU	Sciences de la transplantation	Jean-Paul SOULILOU	PRES L'UNAM	Univ. Nantes , CHU Nantes + other public and private partners
EQUIPEX	NAOS	Pierre-Yves Le Traon	IFREMER	UMPC – UEB – CNRS – SHOM – sociétés CLS et NKE - UBO
EQUIPEX	IAOOS		Centre Paul Emile Victor	UBO, U. Lille, U. Paris ...
EQUIPEX	Robotex		CNRS	Consortium national including ECN, Univ. Rennes 1, Univ. Nates
EQUIPEX	Xyloforest		INRA Bordeaux	Consortium including ESM Nantes
Bioressources et biotechnologies	IDEALG	Philippe POTIN	PRES UEB	Univ. Nantes – UPMC – CNRS – ENSCR – INRA – UBS – UBO – IFREMER – C-Weed – France Haloties – Bezhin Rosko – Agrocampus - Danisco
Infrastructure nationale	Biobanque		INSERM	Consortium national
Infrastructure nationale	EMBRC France		Univ Paris VI	Consortium national
Infrastructure nationale	F-CRIN		INSERM	Consortium national
Institut Carnot	CALYM		13 partenaires	Consortium
Institut Carnot	INRIA-ICI		INRIA	
Institut Carnot	Télécom et sté numérique		Institut Télécom	
Institut Carnot	Ifremer - Edrome		IFREMER	
Institut Carnot	ART		ENSAM – Paris Tech	
Institut Carnot	MINES		Ecole des Mines	
Institut Carnot	CSTB		CSTB	
Institut Carnot	CETIM		CETIM	
Démonstrateurs	PGN	Philippe MOULLIER	Genethon Evry	Genethone Evry, INSERM, Université de Nantes

Investissements d'avenir projects related to the perimeter of excellence (apart from Labex) submitted or likely to be submitted

<i>AAP concerné / Call for proposal</i>	<i>Acronyme du projet / Project acronym</i>	<i>Nom du coordinateur / Name of the project manager</i>	<i>Partenaire coordinateur / Project leader</i>	<i>Consortium /partenariat impliqué / Consortium/ implicated partnership</i>
IRT	B-COM	Vincent MARCATTE	PRES UEB	
IEED	France Energies marines	Yannick-Hervé DE ROECK	IFREMER	UBO – ENSTA – ENIB – CNRS – IFREMER – U. Nantes – Ecole Cenrale nantes -
SATT	Ouest Valorisation	Elisabeth LAGENTE	PRES UEB	UEB – UNAM – CNRS – IFREMER – INSERM - IRD
EQUIPEX	GOLD	Marina RABINEAU	UBO	UBO –CNRS - IFREMER – UPMC – BRGM – IFP - Total
EQUIPEX	EM3OCAN	Bertrand Chapron	IFREMER	IFREMER – Telecom Bretagne – UBO -
EQUIPEX	VERTEX	Georges DUMONT	PRES UEB	UR2 – INRIA -
EQUIPEX	FONS		IFREMER	

**APPEL A PROJETS
IDEX
CALL FOR PROPOSALS
IDEX 2 | PRE-SELECTION
PHASE**

**Acronyme du projet / IC
West**

**DOCUMENT DE SOUMISSION /
SUBMISSION FORM**

EQUIPEX	FT-ICR			Ec. Polytech. - UR1 – UPMC – Univ. Provence – UPV Metz – Univ. Lille 1 – Innova Proteomics – Imabiotech SAS
EQUIPEX	GRID 5000		INRIA	
EQUIPEX	STURDY	Eric COLLET	PRES UEB	UR1 - CNRS
EQUIPEX	PROTON	Jean-Clause SIMON	PRES UEB	UR1
EQUIPEX	PROOF	Philippe GRAVEY Jean Claude SIMON	PRES UEB	UR1 – Télécom Bretagne – ENIB - Orange
EQUIPEX	SEMPLS	Guy OUVREARD	National CNRS	Univ. Nantes, UR1
EQUIPEX	AUDIBLE	Yves AUREGAN	National CNRS	Univ. Le Mans
EQUIPEX	DURSI-EMC2	Monsséf Drissi-Habti	PRES L'UNAM	ECN, EMN, Univ. Nantes....
EQUIPEX	CGB	Michael PRIMIG	PRES UEB	CNRS – UR1 – INRA - INSERM
EQUIPEX	CAPTIMAD	Dimitri VISVIKIS	PRES UEB	UBO - Télécom Bretagne – INSERM – UR1 – INRIA – Philips Healthcare
EQUIPEX	ARRONAX-PLUS	Bernd GRAMBOW BARBET	PRES LUNAM	Gip Arronax, EMN, Univ Nantes, CHU Nantes....
EQUIPEX	OSCO	Martine HAUSBERGER	PRES UEB	
EQUIPEX	Cryo-EM	Reynald GILLET	PRES UEB	CNRS – Univ. Rennes 1 -
EQUIPEX	Condate	Marc JOLIVET	PRES UEB	
EQUIPEX	ZA2020	Yvan LAGADEUC	PRES UEB	
EQUIPEX	ENIVRA	Bernd Grambow	PRES LUNAM	EMN, Univ. Nantes, CEREGE..
EQUIPEX	EMOCEAN	Bertrand CHAPRON	IFREMER	
EQUIPEX	CRITEX		IPGP	UBO-UR1/UEB
EQUIPEX	RIMA	Antoine Grémare	CNRS-INSU	CNRS - UBO – IFREMER – Univ. Lille 1 – Univ. Caen - Université de la Méditerranée – U ; Montpellier 2 – U. Bordeaux
EQUIPEX	BATHYTRON	Mohamed JEBBAR	UBO	UBO – IFREMER – CNRS - UPMC – Université de la Méditerranée – Sorbonne Univ. - MNHN
EQUIPEX	EMSO	C Vallée	U. Méditerranée	Ensta – UBO - université de Méditerranée
EQUIPEX	SISDAV	Louis GELI	IFREMER	IFREMER – CNRS – UBO - IPGP
EQUIPEX	IMERSE	Yves FOUQUET	IFREMER	UBO
EQUIPEX	GEOLITO			
EQUIPEX	SETI-NG		ONERA	
EQUIPEX	EVOLUTION	Bertrand ALESSANDRINI	PRES L'UNAM	ECN
EQUIPEX	FOOD-FOQUS	Bruno LE BIZEC	PRES LUNAM / Oniris	Oniris, Anses, STLO
EQUIPEX	Resif-Core	Bruno GOFFE	CNRS-INSU	QNES; OSU Grenoble, IPGP, Osu Midi-Pyrénées, Osu Oôte d'Azur, Osu Nantes, OSU Montpellier, PPG Clermont
Infra SB	"CEPCS"			

2.2.4 EXCELLENCE PERIMETER, ENVIRONMENT, PROSPECTS AND ADDED VALUE

Departments of Excellence, drivers of scientific and education excellence, attractiveness and talent-promoting environments

As described in section 2.1, the structure of IC West excellence perimeter depends on the innovative and structuring concept of Department of Excellence, whose main features are recalled below:

- A Department of Excellence brings together the Western regions best research teams around a specific, targeted, ambitious and original scientific project lying in a given and well-targeted field
- This scientific project is structured around major societal and economic issues
- A Department of Excellence is a place where the process of enhanced cooperation as well as integration of research, education and innovation–targeted activities between IC West members take place
- An international focus is central to a Department strategy, with the ultimate aim of becoming sufficiently visible and attractive to the international community of the scientific field of concern so as to become a major “international magnet”.

This structure is a way of not only reaching new heights in terms of excellence and scientific visibility, but also of going beyond the usual compartmentalisation brought about by the sheer number of institutions and by the fact that research, training and innovation activities are decoupled. Since Departments are focused on making significant scientific contributions to the major economic and societal issues, they are interdisciplinary in nature, have very clearly-defined research topics, and encompass a limited number of permanent staff of around 500 academics. They are placed in niches of excellence and try to develop a critical intensity in their target field.

The excellence perimeter is therefore focused, narrow and based on high level research and training. It is characterized by:

- 44 units classified as A and A +,
- 1,281 FTE researchers A and A +, representing less than 20% of the total number of researchers in the two regions,
- 1,054 publications for subjects whose impact is two times the global impact,
- 63 A and A+ Masters, counting together 1,983 students. These Masters are also international and include 291 foreign students (over 14% of the total of students),
- 20 A and A+ graduate with 1,090 training doctoral students and 370 foreign students.

**APPEL A PROJETS
IDEX
CALL FOR PROPOSALS
IDEX 2 | PRE-SELECTION
PHASE**

**Acronyme du projet / IC
West**

**DOCUMENT DE SOUMISSION /
SUBMISSION FORM**

These four Departments are based on areas of high impact international publications. They contribute uniformly to the perimeter.



Since international positioning and attractiveness of the Departments of Excellence is a priority, IC West will seek to build up strong and special relationships with a small number of world-level reference institutions, with the idea to constitute, in each chosen domain, a tight network of the best institutions worldwide, on the EIT⁵ organisational model.

Departments of Excellence are a drive to the development of international training excellence

The excellence perimeter for training is based on the same Departments of Excellence. Although training is the responsibility of higher education institutions, Departments of Excellence will help develop integrated international curricula, to accelerate the international opening of the best teaching teams, to accelerate the development of the use of

⁵ EIT: Institut Européen de Technologie et d'Innovation (European Institute of Technology and Innovation)

innovative teaching methods, and to launch new training-based approaches. The excellence perimeter for graduate courses is very focused:

- It concerns mainly high-level training, Master or PhD
- It brings in targeted areas of the Departments of Excellence, the best graduate courses evaluated A or A+ by the AERES
- It focuses on training that is highly open to international: foreign students, courses that take place partly abroad, especially multi-country course built with other international institutions, and particular curricula of excellence recognized as Erasmus Mundus.

The structural organisation of these curricula within each Department will enable the overall higher education offer to be widened, and its coherence and visibility to be reinforced. International development will take place quicker, in particular through the reinforcement of promotional activities abroad. Through the mutualisation of curricula and resources, the overall quality of the higher education offer will be enhanced; new training courses will be developed as well as new teaching approaches. The ultimate aim, here also, is the emergence of fully internationalised training packages in the excellence perimeter - with more than 35% of foreign students and, for all students, completion of a part of their studies abroad - and with an overall strong international visibility.

Departments' projects in terms of excellence in education

Materials Science and Engineering

The development of excellence in graduate courses is at the heart of the Materials Science and Engineering Department of Excellence at the PhD level, but also at the Master level. This can be seen with 5 existing Erasmus Mundus Master and Master recognised as pioneers in the framework of NanoInnov: Computational Mechanics (Nantes, Swansea, Munich, Barcelona), Robotics (Nantes), Acoustics (Le Mans) – under creation, Composites (Nantes, Munich, Madrid, Seville) – under creation, Master Nano (Rennes, Nantes, Lorient).

The 21st Century Ocean

Graduate Courses in Marine sciences and technology has now a well structured base and a very high national visibility. The education field "Marine Sciences and Coastal", which currently has a 6 mention Master and a graduate school (MDHS), aims to expand in IC West. Its international development, whose activation is a central objective of the Labex *Mer*, will be extended and amplified within the Department of Excellence of IC West.

ICST

In 2020, benefiting from the opportunities offered by advances in information technology and communication, a new higher education style will begin to appear, as an alternative to the traditional year-centralized large-groups current approach. IC West will be precursor in this field. Prepared by the obligation to share their way between the various places of IC West, students will have access to open curricula, in European countries as well as in other parts of the world. This approach will be for example, experimented in the ICT EIT master's degree created in 2011 as part of the KIC ICT labs, and to the "*magistère informatique et télécommunication*" organised jointly by ENS Cachan in Rennes and University of Rennes 1.

Biomarkers and Biotherapies

IC West will consolidate and contribute to the opening of international curricula in coordination with the inter-structural projects: *PP-IHU*, *Sirica*, Labex *GCV* and *IGO*. Will be strengthened and expanded joint training, experienced for 4 years between Rennes and Nantes (M2 in oncology, immunology, metabolism, genetics, biostatistics, bioinformatics and translational research), European networks such as ITN in STROMA in the field of

**APPEL A PROJETS
IDEX
CALL FOR PROPOSALS
IDEX 2 | PRE-SELECTION
PHASE**

**Acronyme du projet / IC
West**

**DOCUMENT DE SOUMISSION /
SUBMISSION FORM**

immune-cancerology or Nanofar associating several European universities (St Jacques de Compostèle, Liège, Louvain la Neuve and Nottingham) and teams from the Universities of Nantes and Angers (U646) dedicated to the training of doctoral candidates in the field of nano-medicine and pharmaceutical innovation. Is also envisaged the creation of a department of biology education and research health for the Master, with the objective of increasing the employability of students. This department will integrate research units, the Faculty concerned, business sector partners, and the Hospitals.

In the long term, this structuring process should lead to the emergence of true “graduate schools” or international and themed doctoral schools. Finally, in line with the Departments of Excellence mission, which is to bring together research, training and innovation, these graduate courses will be organised according to two complementary lines:

- A research-targeted line aimed at leading to the highest level of academic excellence graduate courses. Emphasis will be placed on strengthened and very high-level supervision of graduate courses with the involvement of highly reputed national and international participants
- A vocational line aimed at educating students on subjects such as innovation and the setting-up of companies. Emphasis here will be placed on the participation in graduate courses of professionals, working in the field of innovation, and on a great amount of hands-on experience.

The excellence perimeter of IC West

The excellence perimeter of IC West rests on four Departments of Excellence described hereafter.

Information and Communications Technologies and Science (ICST) Department of Excellence - *Digital environments for the citizen*



The ICST Department of Excellence is based on a core of 375 CNRS / INSERM-recognised research laboratories ranked either A+ or, at least, A at the last AERES assessment campaign (FTE Researchers). It relies on the *Comin'Labs* Labex, selected in March 2010, with a staff of 540 scientists from these laboratories. The reputation earned by these teams rests on the high degree of expertise displayed by all the members involved.

The applications developed within the ICST Department of Excellence are by nature multi-disciplinary. Among the challenges of the 21st century addressed by this Department, let us cite:

- Digital environments for the citizen
- User centric images and media for the future
- ICT for personal healthcare

Critical mass and assets:

- 7 IUF members, 1 CNRS silver medal, IEEE Fellows (7 in 2011), a Marconi Prize, member of the French Academy of Sciences
- 2nd French cluster for academic and industrial R&D centres in ICT
- Ranked 2nd in France for the number of ICT patents taken out
- Numerous contributions to ICT international standards (MPEG, DVB, 3DTV, ...)
- European co-ordination of networks of Excellence and IP projects
- Major support from INRIA

Major projects:

- *Comin'Labs* Labex and IRT *B-Com*
- *ICT Labs* within the scope of European Institute of Technology
- Equipex *Robotex* (Robotics & Vision), FIT Internet), *MATRIX*

**APPEL A PROJETS
IDEX
CALL FOR PROPOSALS
IDEX 2 | PRE-SELECTION
PHASE**

**Acronyme du projet / IC
West**

**DOCUMENT DE SOUMISSION /
SUBMISSION FORM**

- Cross-disciplinary researches: Neural coding, Energy and resource awareness in ICT, Social networks, Security and privacy in ICT.

This Department relies on a concentration of skills unique at the national scale, with a notable implication in the research national Alliance “Allistène”. It is worth noting, among them, universities with a strong Maths/ICST component, units from major institutes (INRIA, CNRS and INSERM) and several *grandes écoles* well known for their involvement in the ICST domain (Télécom Bretagne, ENS Cachan, Ecoles des Mines de Nantes (EMN), Insa, Supelec, Ecole Centrale, ENSTA Bretagne, etc.).

The ICST Department has set up a scientific committee composed of about twenty highly reputed researchers working in various fields, from electromagnetism to human sciences through computer science and information theory. The department has also developed close ties (in the form of joint laboratories) with the main industrial groups (e.g., ALU, Orange, THALES, etc.), and it sets up an active network of partnerships with the best academic institutions of the field. Let us cite, for example, the institutions of which members are sitting on the international scientific committee: University of Maryland (ISR laboratory), the Massachusetts Institute of Technology (MIT), Purdue University, VTT, and Kungliga Tekniska Högskolan (KTH).

The ICST Department of Excellence has decided to focus its investigations on two main research directions that constitute two of its excellence areas:

- The “low level layers” (electronics, waves, digital communications and encoding) and the “over-the-top” applications and infrastructures (Web, clouds, services, social networks). Investigations will particularly focus on communicating objects and digital personal assistance, since this field is expected to gain momentum with special issues on security and protection of privacy.
- The materialisation of knowledge as well as its transport and interaction have blurred the frontiers between the oral and written languages especially since the Smartphone revolution. The change in nature and the growing availability of either new or under development media have amplified, far more quickly than expected, the requirements in communication capacity. Even though the interaction facilities have been drastically improved, ability to handle automatically this information has not followed the same progress. The ICST department has selected this research topic as one of its fundamental challenges. A point of convergence with the “Ocean of the 21st century” Department will deal with the techniques applicable to analysis and study of the marine environment.

To sustain these efforts, while keeping a non directed effort toward the search for excellence, the ICST Department of Excellence will concentrate on a limited number of research-targeted actions along the above mentioned lines, through PhD- and Postdoctoral-grants, and endowed chairs with staff.

Thanks to the dynamism of its funding research units, the international ecosystem of the ICTS Department of Excellence is particularly rich. At the European level, besides participation to several networks of excellence, the contribution to the ICT Labs KIC is worth being mentioned. Born with the EIT (European Institute of Innovation and Technology), this initiative federates major European actors on a joint innovation-research-education programme. Moreover, inside the ICST Department, the *Comin'Labs* Labx has set up an international advisory council composed of professors and private research members chosen for their expertise and the excellence of the laboratories. This council, chaired by the ISR funder (Institute for Systems Research, a laboratory of the University of Maryland), will gather members of the MIT, KTH, VTT, other foreign universities and large international companies (IBM, Alcatel-Lucent). Giving to this structure an active role in its strategic search of excellence, the ICST Department will comfort its position at the best level of international research in ICST field.

The 21st Century Ocean Department of excellence



Truly outstanding cluster for the Brittany and Pays de la Loire regions whose excellence is recognised across France and abroad (contribution to the creation and development of the European Research Area, seat at the Marine Board of the European Science Foundation, more than 30 international awards in 2009 – 2010, seat of IMBER programme, 2005-2012), the 21st Century Ocean Department is ranked in the top 10 international clusters in its field. It rests on a critical mass of 203 FTE researchers and academic staff that work within laboratories ranked A or A+.

The 21st Century Ocean Department relies on strong trans-disciplinary scientific expertise, enabling it to address the following societal issues: What is the contribution of the ocean (through the physical, chemical and biological processes that take place within it) to the regulation of climate change? How does this change generate feedback loops in its regulation activity? Which are underlying processes governing the impact of global change upon the biodiversity and the biological resources of the ocean? How can one prepare a viable future for the coastal zones subjected to a dual global change: (i) the concentration of the world population and the development of new activities such as energetic exploitation on a narrow coastal band and (ii) the inexorable rise of sea level?

To address these issues, the strategic project developed within the 21st century Ocean Department is built around five main research programmes:

1. Ocean-climate interactions and vulnerability. This theme relies heavily on the Labex *Mer*, comprising four of its main scientific axis on issues ranging from the global ocean

Critical mass and assets:

One of the world's top 10 excellence centres

- More than 2/3 of the French potential
- Major role in the building of the European Research Area
- Major support from Ifremer

Major projects

- 3 infrastructures selected
- Equipex *NAOS*
- *IDEALG* (Biotech)
- *EMBRC*
- Labex *Mer*
- *IEED France Energies Marines*

- to the coastal areas: (i) the "ocean engine" at high-resolution, (ii) the complexity and efficiency of the biological carbon pump, (iii) the observation, modeling and scripting of the coastal areas, (iv) the functioning of marine habitats and population adaptations: retrospective and predictive modeling approaches.
2. The deep ocean: geo-biological interactions, material fluxes and mineral resources. The exploration and study of the deep ocean are major challenges because of active geological processes which they undergo, of their resource potential, and of their biodiversity. This is to ensure better control of operations of mineral and energy resources, while preserving unique ecosystems of major interest. This field of research is also closely linked with Labex *Mer* deep ocean axis.
 3. Biodiversity: from exploration to exploitation. Biological resources represent a unique potential in high added-value biomolecules with applications in many fields (health, agriculture, bio-fuels, etc.). To isolate new species and marine biomolecules, it is necessary (i) to further study biological models and to report on biodiversity with high-throughput genomics and environmental meta-genomics approaches, (ii) to maintain inventories of chemo-diversity and to automate bioactivity testing of macromolecules and secondary metabolites, (iii) to develop new extraction and separation techniques for the needs of biotechnology and bioprocess engineering.
 4. Sustainable exploitation of marine resources and areas: change, hazards and governance. This research programme, extending Labex *Mer* axis 5 and 6, is oriented towards: (i) the study of the ecosystemic approach of living resources, (ii) the society facing hazards and marine, natural and human risks.
 5. Observation systems, hydrodynamics, marine structures and energies. This theme, expanding to European and global level, is based on the dynamics of engineering sciences coupled with marine science in the broad sense. It interfaces with the work in the IRT Jules Verne in Nantes, including its platform Technocampus Ocean and with the IEED *France Energies Marines*. It focuses on observation of structure behaviour in marine environment and on hydrodynamics.

This Department of Excellence is supported by the "Investissements d'avenir" programmes: Labex *Mer*, Equipex NAOS, the biological programmes EMBRC-France, iDEALG, EDROME Carnot Institute, IRT *Jules Verne* and IEED *France Energies Marines*.

Since 2004, academic and research institutions of Bretagne (UBO, UPMC, UBS, Ifremer, CNRS, IRD, MNHN, IPEV, Telecom Bretagne, ENSTA Bretagne, Ecole Navale, ENIB and ISEN) have been united under the "Europôle Mer" cluster, a GIS established in 2007 recognised and funded by MESR and national research organisations (CNRS, Ifremer, IRD, etc.). It was precursor of the 21st century Ocean Department of Excellence. Its attractiveness has been strengthened by the inclusion of international chairs initially within the "Pays de la Loire" cluster called "Pôle Mer et Littoral", composed of Nantes University and actions targeted to scientific hotspots. Its members are significant contributors to the development of a hierarchical structure within the European Research Area (Networks of Excellence, Integrated programmes, ESFRIs, I3,...). Since 2009, the 21st century Ocean Department has integrated, Ifremer, CNRS and Ecole Centrale de Nantes (ECN). Among the 4 "Observatoires des Sciences de l'Univers" (OSU) supported by this

Department, 2 are exclusively devoted to marine sciences (IUEM at Brest and the Biological station at Roscoff). The sustained and organised presence of CNRS and IRD institutes gives evidence of a national research structuring process already in progress around universities of West France offering, through OSU interactions, a unique framework for an academic development of excellence.

The Department relies on a shared resource centre between UBO, IFREMER and IRD (Library La Perouse, Brest).

From now to T0+4, the goal of the “Ocean of the 21st century” Department will be to exert a significant and decisive effect upon the Joint Programming Initiative Oceans, JPI-Oceans (“Healthy and Productive Seas and Oceans”), which unites the efforts made by 15 countries including France.

To address the major scientific issues of the Ocean of the 21st century, the scientific community will rely on the privileged relationships established with others through international programmes (e.g. IMBER(IGBP/SCOR), InterRidge, IODP/MI, etc.), co-operation actions with institutes from the countries of reference, i.e. San Diego (USA), Japan, as well as the new driving forces of the 21st century world oceanography (the leading emerging countries within BRICS: Brazil, Russia, India, China and South Africa). By favouring the creation of European/international joint laboratories throughout the next decade, the ultimate goal is that the Department position be strengthened at T0+10 in comparison with its main competitors at the world scale, i.e. WHOI in USA, JAMSTEC in Japan.

Materials Science and Engineering Department of Excellence



The Materials Science and Engineering Department of Excellence is built up around fields of excellence in materials, mechanics and processes, molecule engineering, materials and innovative instrument development. Numerous institutes (IMN, IRCCYN, GeM and IEAC in Pays de la Loire, IPR and SCR in Brittany) and BRESMAT GIS (Brittany) have given these topics international visibility.

Today, Materials are intended to address the societal issues associated to clean mobility, production (storage) of carbon-free energy, reliability-security, end-of-life management of materials. The economic and scientific issues falling under the scope of the “from molecule to object” approach or in the product-process co-design are of

Critical mass and indicators of excellence

- 10 IUF, 1 silver and 3 bronze CNRS medals,
- Ranked 3rd in scientific production (with Ile de France and Rhône-Alpes)
- Ranked 1st in Europe (4th worldwide) for the number of papers in acoustics.
- Major support from CNRS

A tradition of research partnerships:

- Techno-Campus EMC2, which encompasses, on a single site, 300 academic and industrial researchers,
- “Centre de transfert de technologie du Mans » (CTTM), 2nd French technology resource centre

Major projects:

- *IRT Jules Verne* (production technology)
- *Equipex Rock*
- Labex: *Factory, Double Command*

key-importance.

To address these issues, the Materials Science and Engineering Department of Excellence has developed, at an exceptionally fast pace, a dynamics focused on, at least, 3 levels: (i) chemistry and physics fields with amplifications of the already close ties woven, in particular, between IPR, SCR (Rennes) and IMN (Nantes) in relation to functional materials, (ii) engineering fields with emergence of an Engineer Sciences reference cluster built in relation with GeM (Nantes), LIMATB (Lorient), ENS Cachan (Rennes), a spin-off of ENS Cachan (Paris), together with the reorganisation of ENSTA-Bretagne (Brest) and INSA-Rennes with IRCCYN (Nantes) and Laum (Le Mans) (within this cluster and in support to IRT Jules Verne, mechanics, cybernetics and acoustics are interconnected by a cross-cutting research axis), (iii) the frontier between chemistry, physics, and structures & systems engineering. This result in the emergence of a cluster, which cannot be ignored at the international level, including the whole chain of processes from the design of structures to their manufacturing in order to deal with major industrial issues in relation with the industrialisation of novel functional materials (energy-saving, for example).

The “molecule to object manufacturing” project developed within the Materials Science and Engineering Department of Excellence relies on three research lines presented hereafter and organised within the framework of two new Labex projects in addition to the (previous) Labex STORE-EX and four interdisciplinary research topics, which enable the development of cooperation between the driving forces:

- Axis 1 – “Double Command”; This Labex federates several research units from Brittany and Pays de Loire, and among them, the project carriers are IMN, SCR and IPR. The structuring challenge is targeted to the “Control of matter response to application of an electric or photonic at ultra-fast AND ultra-small scales”.
- Axis 2 – “*Factory*”. This research line will rely on the Labex that unites Laum, Larmaur Glass, IRCCYN and GeM to meet the ultimate goal of addressing a scientific and general challenge, *i.e.* directing a procedure or a process through either control of a production tool or active monitoring of a given structure. To meet this challenge, from a deep knowledge, at several scales, of the material or structure under study, unconventional numerical methods will be developed as well as new robots and sensors.
- Axis 3 – Materials and Energy. This research line is devoted to the development of materials dedicated to energy. One of the aims is the development of connections with the current materials used for structures (marine energy, wind farms, offshore) and original physical tools by resting on fields of competence available in Brittany and Pays de la Loire.

At the interface between these three axes, four cross-cutting research lines will be also developed: they deal with materials for information and communication, composite structures, structure determination and virtual materials. Beyond the creation of the two Labex projects mentioned hereabove, the ultimate goal of IDEX is: (i) strengthening two highly-visible fields, which are in constant evolution and (ii) developing novel education actions such as:

1. Creation of a Glass-dedicated research centre so as to cover the whole scope of glass science from molecule to device.

2. Set up of a composite-material dedicated research centre so as to unite the researchers working in this field, mainly on the three topics mentioned above: (i) composite formulation (GeM, IRCCYN, LAUM, LTN, IMN), (ii) biosourced composites (LIMATB, IRIM2F, GEPEA, GeM) and (iii) calculation of structures (GeM, LIMATB, LBMS).
3. Creation of a Material library called “*Matériauthèque*”, which will be a showcase of the academic and industrial know-how about Materials and Processes (e.g. experiment from Polytech Nantes). It is expected to constitute a knowledge transfer centre dedicated to the different academic partners.
4. Development of educative schemes available to distant sites through the IC West *Campus Numérique* facilities.

Regarding the priorities of international development, the Department’s aim is to reinforce international collaboration with several sites meeting (i) academic excellence at the highest international level and (ii) an integrated approach, including research, training and innovation. They include:

- Tohoku University (Sendaïe, Japan) which is the 1st world universities in materials science and engineering (24th Shanghai ranking and third in the field of Materials Thomson Reuters ISI ESI). It hosts one of five World Premier Institutes set up by Japan in 2007, the WPI-AIMR (Advanced Institute for Materials Research). The University is linked in recent years in the field of materials in Rennes and the IMN recently became a partner.
- University of Delaware (United States) is the largest university of Delaware. The main campus is in Newark. It is medium in size with approximately 16,000 undergraduate and 3,500 graduate students. In 2009, UD ranked No. 22 in the category list status Kiplinger Personal Finance magazine's 100 Best Values in Public Colleges. In 2010, UD is ranked 159 in the Shanghai ranking. The University has links with the party engineering pole and there it is important to link the upstream most basic research. We focused on three departments: Center for Composite Materials (Historical Connections with Nantes) Center for Catalytic Science & Technology Center for Energy and Environmental Policy, Center for Spintronics and Biodetection.
- M2I (Netherlands): This public-private partnership combines the best Dutch universities (Delft, Eindhoven, Utrecht) and builds stronger partnerships with the best European universities of the area (Cambridge, Oxford, Chalmers, EPFL, etc.). Topics include: materials for energy (photovoltaic and batteries), structural materials (aeronautics, wind).

"Biomarkers and biotherapies" Department of Excellence



A strong feature of the health-targeted research activities carried out in Brittany and Pays de la Loire is the major development of translational research from the patient to fundamental knowledge and then back to the patient. It relies on a strong integration of A and A+ ranked INSERM Clinical Investigation Centres from the University hospitals of Nantes, Rennes and Brest, a critical mass of fundamental and clinical research teams of international reputation (ranked either A+ or A) supported by the main institutional bodies (INSERM and CNRS) and located at Nantes, Angers, Rennes and Brest. Health-targeted research is also supported by shared platforms, favouring a hierarchically-organised research policy, strengthened by the strong implication of one of the four French veterinary schools (ONIRIS), and the availability of a platform investment coordination structure (BiogenOuest). Finally, the department will rely on one of four veterinary schools French (ONIRIS) to ensure a high level of education in comparative pathology, most commonly in animal models in biotechnology and health (veterinary sector and industry engineers biotech-health).

IC West research teams enjoy a strong international reputation. In Cardiovascular Genetics (7 % of publications in cardiology are in the top 1 % worldwide and 30 % in the top 10 % ; the transatlantic network "sudden cardiac death Alliance Against", is "core member" for genetics in the transatlantic network mitral ; in immuno-oncology / restorative and regenerative medicine, the teams of the UMR892 and their clinical partners (which include more than 20 researchers with H index > 25) are involved in over 15 European networks and play a major role in several cooperative groups and clinical networks national (French Institute for Myeloma, GOELAMS, SFM,...); the unit headed by D. Valmori (H index > 40), rated A +, is the only french antenna of the prestigious network of the Ludwig Institute for Cancer Research (LICR), and is strongly supported by the Cancer Research Institute (NY, United States)...

The "Biomarkers and biotherapies" Department of Excellence addresses major societal issues: to implement personalized medicine and the development of innovative biotherapeutic approaches. One of its main goals will be to boost the identification of therapeutic targets through the development, integration and standardisation of innovative screening strategies and wide biomedical applications. These data will directly result from technological innovations and physioopathology studies. In order to address these issues the Department of Excellence will conduct its research within two key fields:

Critical mass and indicators of excellence

- 2 IUF members, 1 silver medal CNRS, 1 RTRS on organ transplantation,
- More than 50 researchers with H-index > 25
- 1st leading kidney grafting centre in Europe
- 3rd research cluster in France in terms of University Hospitals
- 1st worldwide in calcium phosphate biomaterials
- Support of international training
- Major supports from INSERM, CNRS and INRA

Major projects

- PGT project, a unique european consortium for viral vectorisation
- 3 clinical research Centres in F-CRIN* and participations to 4 Bio-banks*
- 3 participations in Cohorts*
- 2 Labex projects : *GCV et IGO*
- *PP-IHU CESTI*

1. Cardiovascular genetics⁶ (CVG) : twenty teams spread over 6 units are concerned by this research line, which aims at developing a translational research from the patient to gene, and then to function and finally back to the patient thanks to their broad field of expertise, i.e. in epidemiology and genetics as well as physiology and physiopathology. This research line is hinged around the *AMP3* Labex project, which federates 21 teams. By extending to IC West perimeter the experience acquired by the staff of the thorax institute⁷, Labex *AMP3* aim is to apply the successful research approach developed for rare diseases (i.e. from the patient to the lab bench and vice-versa) to the chronic cardiovascular diseases.
2. Immuno-oncology and regenerative medicine (transplantation / gene therapy / tissue engineering) (IOMRR): twenty-four teams from 9 INSERM units highly reputed in the fields of oncology, immunology, transplantation and regenerative medicine, gene therapy, tissue engineering and particle vectorisation. This research line is structured around several established collaboration programmes or under development or scheduled. In particular : (i) a Labex (Immunotherapy Graft Oncology, *IGO*) uniting 15 teams from the IOMRR research line, to be submitted within the framework of 2011 call for proposals, (ii) a “promising project”-recognized network (*PP-IHU CESTI*⁸) and (iii) a project of development of a comprehensive cancer research center (SIRIC). Several teams of the IOMRR research line are also jointly implicated in European networks such as Reborne and Nanofar, which fall under the scope of “Tissue engineering and nanomedicine”.

The "Biomarkers and biotherapies" Department teams are granted access to several technological platforms, which have been usually given seal under the scope of national or international call for proposals (IBiSa and F-CRIN, respectively) permitting the development of transdisciplinary programmes in fundamental, transnational and clinical research. Let us cite two cell and gene therapy units devoted to the production of therapy-targeted cells for academic and industrial partners (Nantes), several IBiSA-sealed high throughput screening platforms for studies in genomics and proteomics (Nantes, Rennes), several platforms for the production of either viral vectors (Nantes) or synthetic ones (SynNanoVect, under the IBiSA seal) (Rennes / Brest), iv) an IBiSA-sealed platform for screening on cells (ImpACcell) (Rennes), IBiSA-sealed platforms dedicated to microscopy and imaging (Nantes, Rennes, Angers), several IBiSA-sealed animal model platforms at Nantes, i.e. mouse (*Cardiex*), rat transgenesis *plus* the primate platform within IFR26 (Nantes), transgenic *Xenopus*-generating platform (Rennes). With regard to large animal, the department will rely on the platform of biotherapy and animal pathophysiology as well as the CRIP: the Centre for preclinical research and investigation (accommodation capacity, experimental surgery, *in vitro* and *in vivo* functional exploration as the medical imaging, pathology expertise and models of spontaneous pathologies recruited through the veterinary University Hospital) of ONIRIS (Nantes). Several biological resource centres (biobanks and cohorts) are recognised by either institutional bodies (INSERM, INCa...) or European institutions (BBMRI). It is also worth citing 5 A+-ranked clinical investigation centres at Nantes, Rennes and Brest; among them 4 fall under the scope of F-CRIN network and a high-energy/high-intensity cyclotron (Arronax, Nantes) dedicated to the large-scale

⁶ Genetique CardioVasculaire (GCV) [CardioVascular Genetics (CVG)]

⁷ Institut du Thorax (Thorax Institute)

⁸ Projet prometteur Instituts Hospitalo-universitaires (PP-IHU) [University Hospital Promising Project]

**APPEL A PROJETS
IDEX
CALL FOR PROPOSALS
IDEX 2 | PRE-SELECTION
PHASE**

**Acronyme du projet / IC
West**

**DOCUMENT DE SOUMISSION /
SUBMISSION FORM**

production of radionuclides of key-interest for nuclear oncology applications (this tool is unique in Europe).

The set up of a structure in charge of co-ordinating the investments made on platforms (BioGenOuest) has enabled a technological development hierarchised policy to be organised over the whole Brittany/Pays de la Loire region. IC West project is aimed at enhancing the Department's visibility and the consistency of its two main research lines by setting bridges between the ongoing or scheduled IC-West-specific research projects and those done in collaboration with others. Beyond the research priorities, other actions will be aimed at: (i) consolidating the ongoing projects that fall under the scope of INCa programmes (SIRIC) and "Investments d'avenir" projects, and (ii) opening them to other teams within the CVG and IOMRR research lines that are involved in distinct but complementary projects. Cross-cutting technological actions will tend to promote technological developments targeted to the showing of differences and the structural organisation of tools and platforms made available to the Department teams. Among the Department's priority actions, let us cite: the "genetic epidemiology" project targeted to the development and availability to the University hospital community of the Brittany- Pays de la Loire region of methods and algorithms in sequencing of the whole genome, of exomes and transcriptomes, integrated functional genomics, genome-wide association studies (GWAS) ; the "Engineering, genetics, vectorology, transgenesis" technological project; the "Molecular imaging and vectorised radiotherapy" technological project; the "Regenerative medicines" technological project.

The Department's international policy priorities are to (i) strengthen the European student-exchange networks for PhD-student exchanges with international teams (in oncology the "Marie Curie ITN programme" for exchanges mainly with York university (UK), Erasmus University (Rotterdam), Institute of Science and Technology (Austria) (U917) ; Erasmus Mundus Nanofar programme (nanomedicines) (U646 - U892 - U917)), (ii) support the emergence of new exchange programmes under the scope of large international networks where the Department teams have a major contribution : the "alliance against sudden cardiac death", the "mitral" transatlantic network, the "Ecole Européenne des Sciences de la Transplantation" in partnership with the Imperial College (London, UK), ...; (iii) strengthen the main exchange programmes (PhD student, postdoctoral scientists and posted scientists) with major foreign institutes In immunology-Transplantation (Impérial College London), in Genetics (University of LAVAL Quebec, Canada), Oncology (NIHS Division of Pharmacology, Biological Safety Research Center, Tokyo Japan and KNIH Center for Genome Science and National Biobank of Korea, Séoul).

IC Ouest will bring major added value in concentrating its funding on the excellence perimeter and make a priority of strengthening the Departments of Excellence

The first benefit of the IDEX is the positive impact that it will have on structuring the RES in Brittany and Pays de Loire. In particular, it will make possible the move from the current "brick" system (where the "bricks" are the different projects selected in the "Investissements d'avenir"

calls for proposal) to an overall project system. The main structuring effects are expected to be as follows:

- The creation of Departments of Excellence will give birth to large, very high-level laboratories having the means to compete, in their niche field, with the best institutions in the world.
- These Departments of Excellence will adopt an integrated research – training – innovation approach. This will nicely avoid the “compartmentalisation” that is currently at play so as to better meet the contemporary economic and societal needs, which requires to consider simultaneously these three aspects.
- Through its highly integrated, inter-establishment approach, the IDEX will naturally bring about closer collaborations between the member institutions and facilitate any mergers that may be necessary.

The second main impact of IC West will be in the subsequent increase in the amount and concentration of funding to be invested in a limited number of priorities. Internationalisation of the Departments of Excellence will reap the maximum benefits in this respect; it is IC West first priority and it has been allocated 60% of IC West funding. Besides receiving a significant portion of the funding, the international policy has been very concentrated geographically and it favours an “in-depth” partnership approach that combines research, training and innovation. Its aim is to develop the Departments of Excellence into world-recognized leaders in their well-defined fields. Furthermore, in each of these fields, it aims to build a very tight network of the best laboratories in the world; one that fosters strong and long-lasting relationships, and which takes its inspiration from the current developments that are currently taking place within the European Institute of Innovation and Technology.

From this perspective, the Departments of Excellence will have a very significant average funding, amounting to 16 million euros annually (including the budget of the Labex). Among the quantitative impacts expected:

- Increasing the number of foreign researchers in the Departments of around 15% at 4 years and 50% at 10 years,
- Increasing the impact factor of publications by field of 15% at 4 years and 50% at 10 years,
- Increasing the % of students undertaking a period of training abroad that about 50% at 4 years and 100% at 10 years,
- Increasing the volume of research (15% at 4 years) and the number of chairs partnership (10% in years 30 to 10%), etc.

Perimeter dynamics: specific evolution and maturation processes

IC West places at the heart of its project, to control the dynamics of its perimeter of excellence. The major priorities pursued are:

- To create a sound model of cooperation, both within IDEX and externally
- To make decisions on the basis of objective criteria, that is independently evaluated assessed on the results
- To remain focused and to ensure that funding is concentrated on the leading projects and actors.

In general, the different processes of evolution will be set out explicitly and will be submitted to the Strategic Committee, which is composed of non-IDEX scientific experts, before approval by the Governing Board. Independent international experts will also participate in the evaluations carried out on the application of these evolution processes.

Evolutions could be made internally in a Department by the arrival or the exit of teams. The decisions are taken after an external evaluation, as described above. They will be taken by the Department if they do not lead to increasing the size of the department. In the opposite case, they will be taken by the Governing Board, inside a ten percent limit. If a more significant change is envisaged, the Department's strategic draft must be updated and must be previously agreed. The teams that apply to enter into a Department must in particular demonstrate their involvement and their results on the major projects led with the Department teams.

As far as the Departments are concerned, a "maturation grid" will be defined and implemented. This grid aims to position each Department on a scale ranging from "new department" to "department of an international repute". The aim of the grid is as follows:

- Provide for the transparency in the positioning of a Department on an international scale of comparison,
- Stimulate the progression of each Department within the IDEX,
- Adjust the type of support of the IDEX to the Departments. Some actions or tools will therefore be dedicated to some levels of maturity of the Departments, or can be deployed in a manner more or less important according to the situations.

The grid, the initial positioning of the Departments, changing the position of Departments on the grid, will be submitted to the prior advice of the Strategic Committee, as described above. The grid will be multi-criteria and will cover in an equal fashion the three lines of research, education, and innovation. New Departments may be created over time. The processes of preparation and rigorous evaluation will be defined and implemented, with the support of the Strategic Committee. The maturation phase will be managed under the aegis of the Inter PRES, therefore external to IDEX. Before this phase of maturation, a structure in the form of a research, training and innovation centre should have been put in place. Before being able to request entry into the IDEX, an observation period of four years will be put in place. During this phase, regular reporting to the IDEX will be ensured. Finally, in order to maintain the intensity of financial intervention of the IDEX on its perimeter of excellence, the creation of a new department must be accompanied by an additional funding plan.

The final decision will be taken in view of the results of the current call for proposals, especially for the Labex. If these results show that one of these Departments is not sufficiently robust, then it will be removed from the initial perimeter of the IDEX and placed in a phase of maturation, with the perspective of resubmitting a candidacy to enter the IDEX four years later. In addition, if the Labex projects that do not figure in the current IC West perimeter are selected by the second Labex call for proposal, they will be prioritised to enter into a maturation phase and to request their integration into the IDEX at T0+4. This is in particular the

case in the agronomy domain, a strategic sector of the West, that is in the structuring phase and which carries a wide range Labex project.

2.3. PROJECT AND PROSPECTS

Three priorities – Departments of Excellence, innovation, dynamic evolution – and an efficient and focused portfolio of actions

To reach its ambition, IC West has three strategic priorities:

1. Priority n°1: Creating Departments of Excellence with international position
2. Priority n°2: Making innovation a driving force of IC West
3. Priority n°3: Ensuring enlargement of the excellence perimeter as well as excellence of infrastructures

These priorities are stated in a coherent and tight portfolio of 12 actions, organised in 7 axis, and targeted either to IC West community and the Departments of Excellence (the excellence perimeter of IC West) or to the full western RES.

Portfolio of actions	Inside the excellence perimeter	Outside the perimeter
Priority n°1: Creating Departments of excellence with international position		
Axis 1: Strengthening Departments of Excellence in research and education	Action 1 – Fund Labex	
	Action 2 – Strengthen strategic projects of the Departments of Excellence at the international level	
	Action 3 – Support mission for international reputation	
Axis 2: Developing international research partnerships	Action 4 – Industrial chairs and joint public-private laboratories	
Priority n°2: Making innovation a driving force of IC West		
Axis 1: Increasing partnership innovation through experiment	Action 5 – Support new innovation approaches	
Axis 2: Developing cross-fertilisation	Action 6 – Support inter-department research projects	
Axis 3: Supporting innovative pedagogies and curricula	Action 7 – Support mission for innovation and experimentation in higher education pedagogy	
Priority n°3: Ensuring the enlargement of the excellence perimeter as well as excellence of infrastructures		
Axis 1 : Ensuring the Evolution of the Excellence Perimeter		Action 8 – Support convergence of research programmes
		Action 9 – International coaching for Thematic Poles under maturation
		Action 10 – Support to talents
Axis 2 : Ensuring the performance of Infrastructures	Action 11 – IC West cooperation and communication digital infrastructure programme	
	Action 12 - « Performing Campus » Programme	

Allocation of means

Actions are deployed and controlled by three different mechanisms:

- Punctual calls for proposals (CP) targeted on both IC West Community and the whole western RES community
- Open call for proposals (OCP) targeted on both IC West Community and the whole western RES community
- Contracts on objectives and means (COM) signed between the strategic governance of IC West and excellence departments. IC West will tend to favour COM types of mechanisms towards IC West community, since they are more flexible than CPs and, in the end, they will comfort the autonomy of departments. Actions devoted to the whole RES community will be implemented through CPs.

A large part of actions, especially those dedicated to the reinforcement of strategic projects and international position of Departments of excellence will be implemented through contracts on objectives and means (COM) linking excellence departments and the strategic governance of IC West. COM will be flexible and agile, and will support the autonomy of the departments in the allocation of IC West funds as long as this is done in coherence with the terms of the COM based on their strategic projects. Besides those mechanisms, permanent transversal tools such as specific support missions for international reputation, or for innovation and experimentation in higher education pedagogy will be implemented.

2.3.1 PRIORITY N°1: CREATE EXCELLENCE DEPARTMENTS WITH INTERNATIONAL REPUTATION AND ATTRACTIVENESS

Portfolio of actions	Inside the excellence perimeter	Outside the perimeter
Priority n°1: Creating Departments of excellence with international position		
Axis 1: Strengthening Departments of Excellence in research and education	Action 1 – Fund Labex	
	Action 2 – Strengthen strategic projects of the Departments of Excellence at the international level	
	Action 3 – Support mission for international reputation	
Axis 2: Developing international research partnerships	Action 4 – Industrial chairs and joint public-private laboratories	

Context and stakes

To answer challenges that higher education in western France has to face, IC West proposes:

- To focus its action on excellence niches where western France has already a strong international position.
- To develop synergies between research, education and innovation, considered as “pillar of the knowledge society”, in order to answer major societal questions.
- To regroup inside a fully integrated structure, the best research and education teams of the western institutions, so as to reach a critical mass at the international level.

**APPEL A PROJETS
IDEX
CALL FOR PROPOSALS
IDEX 2 | PRE-SELECTION
PHASE**

**Acronyme du projet / IC
West**

**DOCUMENT DE SOUMISSION /
SUBMISSION FORM**

Departments of Excellence are therefore at the heart of IC West; they constitute real institutes for research, education, and innovation, with an international visibility. Taking into account the highly concurrent context, the stake is to help these departments to become “international magnet for talents”.

The key objectives are to:

- Recruit and welcome best talents, in a totally international perspective,
- Help departments become more present at the international level,
- Develop international excellence courses, in particular, multi-countries curricula,
- Develop international partnership in research,
- Set up an integrated management in the departments, associating the international scientific community.

Strategic axes - To reach these objectives, IC West will put forward two axes:

1. Strengthen the departments in research and education, in an international perspective including : international collaborations in research, international recruitment and attraction of researchers with strong international experience, mobility in excellence courses, international degrees such as Erasmus Mundus programmes.
2. Strengthen cooperative research with international companies, capitalising on international partnerships developed by “poles de competitivité” and “excellence institutes” (IRT, IEED, IHU) in our fields.

These actions will be geographically focused and will have a full approach associating research, education and innovation. They put the emphasis on the management of the most promising talents and will, therefore, help Departments of Excellence to quickly reach a first class international visibility and attractiveness.

Axis 1: Strengthening Departments of Excellence in Research and Education

Goals and indicators			
The aim of the first axis is to establish a minimum of 4 Departments of Excellence recognised amongst the top 5 European research centres in their field. They should become points of attraction for both global and PhD students as the best international researchers.			
Domain	Indicator	T4	T10
Research	Number of high level researchers recruited (price, distinctness) (Foreigners)	4 (3)	12 (10)
	Increased Number of foreign researchers	+ 15%	+ 50%
	Increase the impact factor of publications by key field	+ 15%	+ 50%
	Increased international co-publications	+50%	+100%
	Increase in inward and outward mobility for teachers and researchers	+50%	+100%
Education	Increased Number of foreign students in education	+ 15%	+ 50%
	Increased% of students undertaking a period of training abroad	50%	100%
	Increased Number of multi-path graduate courses	+ 30%	+ 100%
	Part of the Departments with international PhDs	2	4
	Proportion of doctoral students enrolled in international PhDs	25%	50%

**APPEL A PROJETS
IDEX
CALL FOR PROPOSALS
IDEX 2 | PRE-SELECTION
PHASE**

Acronyme du projet / IC West

**DOCUMENT DE SOUMISSION /
SUBMISSION FORM**

Action 1: Fund Labex

Inside excellence perimeter			Outside perimeter	
<u>COM</u>	CP	Transverse tool	CP	Transverse tool

Objectives and principles

The goal of this action is to support the projects proposed by the excellence laboratories (Labex) elected by the “*Investissements d’avenir*” programme, belonging to the excellence perimeter of IC West. At the time of this submission, two Labex are in this case: *Mer* Labex, and the *Comin’Labs* Labex. Four other projects, included in the excellence perimeter, will be submitted to the second Labex call: *Double Command*, and *Factory* in the fields of Material Sciences, and *IGO* and *GCV* in the field of Immuno- and Bio-therapies.

Each Labex will be funded at least at the level obtained at its selection. Labex will develop their project with a large autonomy. However, IC West will help Labex to operate in a very efficient manner, by spreading best practices in terms of management, evaluation, recruitment, etc. A thorough evaluation of Labex will be conducted after a period of 4 years to assess its results and revise its overall roadmap.

Means and implementation

For the *Mer* and the *Comin’Labs* Labex, financial means will amount to 4.93 M € / year completed by contributions of funding partners. For the other Labex belonging to the excellence perimeter of IC West, financial means amount to 3.07 M € / year, corresponding to one or more Labex with approximately 500 teachers and researchers with an endowment comparable to the average Labex already selected. The management mode of this funding will be through COM.

Action 2: Strengthen strategic projects of the departments at the international level
--

Inside excellence perimeter			Outside perimeter	
<u>COM</u>	CP	Transverse tool	CP	Transverse tool

Objectives and principles

The goal of this action is to strengthen the strategic project of each Department, concerning its international dimension in particular. Each department will build an overall road map describing its priorities of development in relation with its scientific programme. Their project will be supported through three main levers: the attraction of foreign researchers, the creation of international curricula and degree and the increase in the mobility to and from the department.

The three main levers in practice:

Lever 1: attract foreign researchers

Each excellence department of IC West will have to identify the best teams world-wide and propose to the researchers and lecturers of these teams an attractive scientific package including top equipments, PhD and PostDoc positions, a significant funding. In addition, when hired, he/she will have the possibility to hire for a limited duration any person of his/her former laboratory and to organise administrative support (specific secretariat), etc. The funding necessary for this lever will be delegated to departments and re-evaluated on an annual basis. We estimate at 500K€/year this type of incentive package. IC West will commit to the allocation of 8 packages over 4 year for the whole excellence perimeter (2 per Department of Excellence)

Lever 2: open international curricula
It is essential for IC West to be in position to propose in situ master degrees in the English language as well as in a distant learning mode or open in foreign locations. Each Department of Excellence will be encouraged and supported to be able to offer one third of its master courses in English, as well as to provide for 200 hours of distant learning courses. To reach these objectives, funding will be provided for the lecturers that will engage in this process, as well as for covering the cost of creating material to this end.

Lever 3: input and output mobility
Departments will be funded to set up instruments for the mobility of masters and PhD students, researchers and lecturers; the choice of these instruments will be tailored to the configuration and the specific field of the department. Mobility here means either international mobility or mobility between the academic and the business worlds. Special care will be taken to the reactivity of such instruments (e.g., advance payment of expenses). IC West founding members will commit themselves to take into account the mobility in the career evolution of lecturers and researchers. Departments will be assigned a minimum objective (e.g. 200 person-month of input mobility, and 100 person-month of output mobility per year). The result of this lever will be assessed every two years.

Means and implementation

This action will use significant funding (i.e., about 20% of IDEX means) delegated to the Departments through the COM mode. Some of these levers are already present as part of the priorities of elected Labex. IC West will sustain and amplify this effort.

Each department will commit itself on precise objectives. It will benefit from a strong autonomy to implement these three levers, results of which will be evaluated *a posteriori*. In practice, these three levers will apply to all Departments, but they will be adapted to the particular situation of each Department, according to its priorities, taking into consideration actions already engaged in the field of international visibility and attractiveness for example.

Additional levers could be mobilised – equipment funding, network organisation, etc. – provided they are in coherence with the strategic project of the Departments and they contribute to their international visibility. As an illustration, one can cite the “European observatory of the change” and the “European centre for the development of See Biotech” actions of the 21st century Ocean Department, that could be supported by IC West.

Action 3: Support mission for international reputation	Inside excellence perimeter			Outside perimeter	
	COM	CP	<u>Transverse tool</u>	CP	Transverse tool

Objectives & principles

The goal of this mission is to bring to IC West the expertise needed to build and expand its international strategy, to help departments in the deployment of their key international actions and to benchmark and capitalise on best practices in international matters.

A support mission for international reputation will be set up and concentrate its action on transversal activities with important added value in close link with research teams, Labex, and Departments. Its missions will include:

- To coordinate discussions on the international strategy of IC West, with the funding partners, Labex and Departments of Excellence. The mission will identify a small number of international leaders in excellence domains as targets, help create international teams, laboratories, doctoral schools or international curricula, support the establishment of a concentrated network of actors of international reputation (say, 5 actors for each Department). This scheme will take advantage of the results of the KIC (Knowledge and Innovation Communities) of the EIT (European Institute of Innovation and Technology).
- To ensure the management and coordination of international agreements and networks and to support the management of complex international operations such as international laboratories and teams.
- To provide research teams with a financial engineering expertise so that they can take advantage of already existing funding programmes (e.g. European programmes).
- To ensure with departments, a watch and prospection to detect and attract in the Western region worldwide-best talents and monitor the best practices at international levels.

Means and implementation

This will consist in operational funds to support mobility (logistic packages for example) and in human resources with an established team of a dozen people. This transverse support mission for international reputation will be based on a single site, in relation with the international teams in place. The mission will build on the expertise of existing mobility centres and international services in place in the founding institutions of IC West.

Centre for International Mobility

Rennes Center for International Mobility provides services to students, PhD students and scholars involved in international mobility on the site of Rennes. It is attached to UEB as part of a European network of over 200 centers EURAXESS Services in 35 countries with a mission of assistance to the mobility of researchers. The center is funded by local authorities of Brittany. A similar service is active in Brest as well as in Nantes (EURAXESS Centre Loire Valley is coordinated by the University of Nantes).

Axis 2: Developing international research partnerships

Goals and indicators			
The goal is to make of IC West a reference in its fields of excellence for major companies at the international level. This can be achieved by creating international consortia associating research institutions and companies of several countries or by creating thematic networks, based on the model of the EIT (European institute of innovation and technology) KICs (knowledge and innovation communities).			
Domaine	Indicateurs	T4	T10
Public-private research	Volume of public-private research projects	+15%	+ 50%
	Number of industrial chairs	+ 10	+ 30
	Share of research partnerships with foreign companies	5%	20%
	Share of reference companies (Top 25 per field) working with IC West	5%	25%
International networks	Number of scientific international networks	2	4
	Notoriety of international networks	qualitative	
	Increased number of links within networks	qualitative	

**APPEL A PROJETS
IDEX
CALL FOR PROPOSALS
IDEX 2 | PRE-SELECTION
PHASE**

Acronyme du projet / IC West

**DOCUMENT DE SOUMISSION /
SUBMISSION FORM**

Action 4: Industrial chairs and joint public-private laboratories	Inside excellence perimeter			Outside perimeter	
	COM	<u>CP</u>	Transverse tool	CP	Transverse tool

Objectives & principles

The goal of this action is to fund research partnership projects with a strong international dimension through the implementation of industrial chairs and joint academic – company laboratories. Ideally, they will have to associate institutions of two different countries as well as companies of two different countries. Support will be given for the “engineering” phase of such projects and also for co-funding the institutions involved in such a project.

Means and Implementation

This action is a major challenge for IC West position and visibility. Opportunities within Departments of Excellence will be examined by the executive committee of IC West, that will also prepare propositions submitted to the Governance Board of IC West for approval.

2.3.2 PRIORITY N°2: MAKING INNOVATION THE DRIVING FORCE OF IC WEST

Portfolio of actions	Inside the excellence perimeter	Outside the perimeter
Priority n°2: Making innovation a driving force of IC West		
Axis 1: Increasing partnership innovation through experiment	Action 5 – Support new innovation approaches	
Axis 2: Developing cross-fertilisation	Action 6 – Support inter-department research projects	
Axis 3: Supporting innovative pedagogies and curricula	Action 7 – Support mission for innovation and experimentation in higher education pedagogy	

Context and stakes

In a world where resources are limited and in a rapidly changing society, innovation is at the heart of the stakes at all levels. Innovation does not only concern technology, even if technology has a place of choice in our society dominated by the impact of knowledge. This is why innovation has to be placed at the heart of IC West, as an economic challenge, but also as a culture and a natural working mode within IC West. Innovation will therefore be encouraged in various way:

- In science, to favour the emergence of new ideas and new research projects.
- In teaching, to renovate pedagogy and to better take into account the expectations of new generations of students, while using the potential of available new tools, especially in the numeric world.
- In business, to accompany the development of new markets as well as start-up creation.
- In management, governance and evaluation of projects: IC West will experiment new practices and spread them.

The key objectives are:

- To be recognised by our communities as innovative in our research projects and themes.
- To become one of the top 3 poles in France, in terms of start-up creation.
- To become one of the first European cluster in terms of company creation in niche fields such as see Biotechnologies or ICST.
- To become a leading actor at the international level in terms of pedagogical education and especially through the use of new technologies for teaching.

Strategic axes are:

- To innovation business oriented innovation, in particular through company creation.
- To develop innovation at the cross-road of various fields, so as to propose new research tracks as well as new curricula.
- To develop innovation in pedagogy, aiming at improving the efficiency of know-how acquisition for students.

Axis 1: Increasing partnership innovation through experiment

Goals and indicators			
New ways of stimulating innovation and implementation of R & D programmes appear regularly. They include think tanks for breakthrough projects, living labs, open innovation, etc. Some of these approaches are particularly relevant in certain areas (ICT for example), but all have the advantage of being an amplification factor of collaborative innovation and a continuous questioning for practices. The commitment of IC West is to support innovative approaches proposed by the scientific community in relation with competitiveness clusters and IRT, IEED, IHU institutes. This axis is based on a generic action entitle Support new innovation approaches.			
Domain	Indicators	T4	T10
Innovation	Number of « breakthrough » projects	8	40
	Number of projects leading to socio economic development	15	40
	Number of partners involved	30	100
	Number of projects supported by this call for proposals valued by the SATT	10	25
	Increase in number of start-ups	+50%	+100%

Action 5: Support new innovation approaches

Inside excellence perimeter			Outside perimeter	
COM	<u>CP</u>	Transverse tool	<u>CP</u>	Transverse tool

Objectives & principles

The main objective is to boost the emergence of numerous emerging ideas at the cross-road of excellence fields of IC West and potential business application, to test these ideas in real situations and to support the emergence of “breakthrough projects” with sometimes strong risk but also strong potential.

New ideas and think tanks will emerge, taking as a starting point existing French or foreign models, such as the “*cantines numériques*” in the field of information and communication technologies (such projects exist in Nantes and in Rennes as part of the *Images et Réseaux* competitiveness cluster). These think tanks are based on the organisation of meetings between actors coming from various fields and activities (business, academic world, designers, actors of

the cultural domain, architects, etc.). Informal exchanges are encouraged through open activities such as debating conferences, testimonies and visits, prospective seminars, etc.

IC West will also set up innovation and experimentation platforms in order to assess the use of new technologies. These platforms will be open and flexible, first of all to allow new ideas to be quickly tested, but also to put users in new situations in order to understand how they experiment new uses for objects and services at their disposal. Such platforms already exist for the IC technologies (Loustic for example). They will be extended to other excellence fields of IC West.

Finally, IC West will support the emergence and the maturation of strong potential projects in terms of technological transfer, especially when projects need new researches to be carried out in relation with businesses. The follow-up phase of such projects will be taken in charge by the Ouest valorisation SATT.

Means and implementation

This action will be mainly based on operating funds but equipment may be, in some cases, funded when it supports experimentation. This will be done on the basis of CP. When it is relevant, project should favour international approaches.

Axis 2: Developing cross-fertilisation

Goals and indicators			
From the perspective of scientific challenges and emerging niches but also technological breakthroughs, it seems appropriate to promote trans-disciplinary approaches. The objective of this axis is to enable these jumps and these breakthroughs approaches involving teams of excellence from distinct thematic backgrounds. Departments have been constructed on the basis of responses to societal challenges. There is already a strong multidisciplinary dimension in them. Projects supported through an annual CP will have a high degree of originality.			
Domaine	Indicateurs	T4	T10
Interdisciplinary Research	Number of research projects at the intersection of disciplines	8	40
	Emerging research areas at the crossroads of disciplines ranked at a national level	1	3
	Number of thesis in collaboration between 2 Departments	10	30
	Number of publications involving teams of 2 Departments	20	50
	A number of A+ teams outside the scope of Excellence supported	10	15

Action 6: Support inter-department research projects

Inside excellence perimeter			Outside perimeter	
COM	CP	Transverse tool	CP	Transverse tool

Goals & principles

The objective here is to support inter-Departments research projects, or also projects elaborated between Departments and other research teams outside the Departments of Excellence. About 10 projects will be selected each year. They should involve only AERES A or A+ research teams, or equivalent.

Means and implementation

This action will be implemented through an annual CP whose evaluation will be conducted by the Strategic Committee with a support from scientific experts.

Axis 3: Supporting Innovative pedagogies and curricula

Goals and indicators			
IC West is an opportunity to develop new curricula in the excellence perimeter, but also to develop new teaching approaches and practices. The objective of this axis is to strengthen the capacity for innovation and experimentation in the field of Education. It provides organizational support to the new courses offered by the departments of excellence, and support the effort on training throughout life. It brings together the goals of educational innovation and technical training of new and major challenges within IC West.			
Domaine	Indicateurs	T4	T10
Education	Number of innovative modules developed	20	100
	Increase in the use of innovative modules	+ 10%	+ 100%
	Increase in the use of innovative methods	15%	30%
	Number of courses using innovative methods	2	10
	Number of courses adapted to life long training	10	25

Action 7: Support a mission for innovation and experimentation in higher education pedagogy

Inside excellence perimeter			Outside perimeter	
COM	CP	<u>Transverse tool</u>	CP	<u>Transverse tool</u>

Goals & principles

Brittany and Pays de Loire have already a noticeable number of international curricula (Erasmus mundus masters for example). Both regions have also multidisciplinary curricula that IC West will promote at an international level. The role of IC West will be to support the visibility of such graduate courses as well as to encourage new learning processes, and to provide the teachers with the appropriate support to get acquainted with these new processes.

To fulfil these goals, we propose to create a mission for the innovation in pedagogy and the management of new curricula (IC West education mission) with several main objectives:

- To provide support for the training programmes of the excellence departments under the heading “Certification and internationalisation of training programmes in excellence departments”. This action shall be accompanied by an international communication.
- To provide support for (i) assisting lecturers to meet international teaching standards and facilitate course organisation, (ii) supporting joint training projects and joint certification, (iii) encouraging the creation of international summer schools, (iv) applying an active policy of support for courses abroad, (v) and broadening the scope of language training. The current figure of 35% of foreign students in our international Master’s degree courses could thus be considerably increased
- To reinforce research-based education through upgraded PhD programmes

Attractiveness of PhD

Particular emphasis will be placed on PhD programmes. Training doctoral students who are aware of their place in society is a priority in order to make the PhD more attractive and to help doctoral students to fit into a career, whether academic or corporate. The first requirement is to support the doctoral training. In general, and IC West will promote the provision of training and monitoring by the PRESs' services and promote access for e-learning based on the doctoral schools. IC West will also aim at strengthening access to business through contacts with the IRT, IEED and competitiveness clusters. Double the number of doctoral allowance by company to train research managers will be a target with emphasis on the value of the thesis internationally. Other objectives will include: hold places of exchange with businesses, encourage training for doctoral students; open a label "IC West - PhD" for companies that value doctors, etc.

- To create new courses and new teaching approaches. IC Ouest shall propose the creation of new courses and encourage new teaching methods, particularly by strengthening its position in e-learning. Both our regions are doing very well in this domain. IC Ouest should be able to demonstrate in the short term that it is possible to study in institutions that are geographically separated without encountering any difficulties
- To develop distance learning techniques for both students and teachers. Distance learning is already an important development priority of PRES UEB and L'UNAM, and the expansion of courses in the two Regions means that this project will be strengthened in order to reach its full capacity. UEB C@mpus (<http://www.numerique.ueb.eu/>) was considered a "promising campus" in the 2009 project tender. From this point of view it is an essential facility, making courses available to all the institutions. One of IC West priorities shall be to constitute a single distance learning platform, with the concrete objective of making all the material for the excellence initiative and 20% of the material for all the other courses available in electronic form. This means that all students in our two Regions shall have access to a single Digital Work Environment which shall be operational 24/7 in the IDEX area. This objective requires considerable investments
- To provide support for life-long training. The key challenge facing us is that of attracting a wider range of students into higher education. IC West proposes setting up a platform of resources and services geographically spread across the two Regions, certified for quality-process and meeting international standards. This platform shall supply all participants with the tools required to identify needs, construct the appropriate courses and provide methodological support
- To coordinate and support research on learning techniques, in relation with the above goals. It is to be noted that two research units exist in Brittany (the CREAD, *Université Rennes2* and UBO, A+), and in Pays de Loire (the CREN, *Université de Nantes* and *Université du Maine*), which could contribute to such a mission. Moreover, the creation of ENS Rennes should also be a contribution to the training of future academics and researchers.

Means & implementation

As for the support mission for international reputation, the mission for Innovation and Experimentation in Education will spend approximately two thirds of its budget to fund projects selected following a CP, the last third being devoted to cross-cutting

programs support (e.g., analysis of best practices, educational seminars, evaluation of educational innovations, etc.).

The mission for innovation and experimentation in Education is based on a small but dedicated team, with a strong experience.

2.3.3 PRIORITY N°3: ENSURE THE ENLARGEMENT OF THE EXCELLENCE PERIMETER AS WELL AS EXCELLENCE OF INFRASTRUCTURES

Portfolio of actions	Inside the excellence perimeter	Outside the perimeter
Priority n°3: Ensuring the enlargement of the excellence perimeter as well as excellence of infrastructures		
Axis 1 : Ensure the Evolution of the Excellence Perimeter		Action 8 – Support convergence of research programmes
		Action 9 – International coaching for Thematic Poles under maturation
		Action 10 – Support to promising talents
Axis 2: Ensure the Performance of Infrastructures	Action 11 – IC West cooperation and communication digital infrastructure programme	
	Action 12 - « Performing Campus » Programme	

Context and stakes

This priority has two axes: firstly, to ensure the maturation of the Thematic Poles of the RES towards the status of Departments of Excellence, and thus to enlarge the excellence perimeter; secondly, to bring attractive conditions for everyone through excellent infrastructures.

One of the main characteristics of the potential of the RES of the Western regions is its rapid evolution, quantitatively and qualitatively. In addition, the process of building excellence is more recent than in other national sites and more complex as well. Those three factors - changing, new and complex process - justify why IC West will establish a structured evolution process applied to the excellence perimeter aiming at maintaining a high density of scientific excellence in the perimeter.

Some Thematic Poles have high potential for research and advanced training but have not necessarily reached a sufficient level of maturity for the development of a coordinated roadmap including all scientific stakeholders, covering the 3 critical components: Research / Education / Innovation. The maturation process is designed to provide appropriate support (e.g. convergence programmes) to Thematic Poles in their development and structuring. A second priority is the provision of attractive environments and infrastructures for students, researchers and lecturers involved in the perimeter of excellence.

The key objectives are:

- To support the Thematic Poles under maturation,
- To provide the Thematic Poles with international coaching,

- To identify and support promising talents to ensure the development and renewal of the human potential of IC West,
- To provide excellent physical and communication infrastructures to the entire scientific community.

Strategic axes are:

- Ensuring the evolution of the excellence perimeter
- Ensuring the performance of infrastructures

Axis 1: Ensuring the evolution of the excellence perimeter

Action 8: Support convergence of research programmes	Inside excellence perimeter			Outside perimeter	
	COM	CP	Transverse tool	<u>CP</u>	Transverse tool

Objectives & principles

The objective of this action is to ensure the convergence of research programmes, in order to maintain a high level of emulation between the teams and enlarge the excellence perimeter. A higher level in the quality of research outside the excellence perimeter on T0, as well as a greater impact of research will be sought.

Means & implementation

Funding will be allocated through CP aiming at the convergence of IC West Community research programmes associating researchers of Departments of Excellence and the rest of the community. They should build common research programmes on topics associated to the core research programme of Departments of Excellence. Those topics will be set by the Executive Committee with the support of the Directors Departments of Excellence.

Action 9: International coaching for Thematic Poles under maturation	Inside excellence perimeter			Outside perimeter	
	COM	CP	Transverse tool	<u>CP</u>	Transverse tool

Goals & principles

This action will involve modest financial means. It will aim to challenge and support Thematic Poles, outside the excellence perimeters, in international actions supporting their visibility and attractiveness.

Means and implementation

As in action n°3, it will consist in operational funds to support mobility (logistic packages for example) and in dedicated human resources from the support mission for international reputation. This actions and corresponding funding will be managed directly by the Executive Committee.

Amongst operations encouraged at an international level we can cite: research partnerships and collaborations, participations in seminars, joint articles and publications, participation in FP programmes of the European Commission, etc.

Action 10: Support to promising talents

Inside excellence perimeter			Outside perimeter	
COM	CP	Transverse tool	<u>CP</u>	Transverse tool

Goals & principles

The goal of this action is to enable researchers outside the excellence perimeter but identified as promising talents (either junior or senior) to concentrate on research activities on a given project for a certain period of time (about 2 years). Amongst the expected results of this measure are: a higher level of publication both in volume and quality, breakthroughs leading possibly to new patents and developments, establishment of international key partnerships on the research topic, etc. Those elements shall contribute to a strong development of the research unit to which the researcher will be associated and, in the midterm, to a possible inclusion of this unit in the excellence perimeter based on excellence criteria and based on the convergence of research programmes.

Means and implementation

Several means will contribute to those impacts, including in priority:

- The adaptation of the teaching workload (with a ceiling of 42 hours of courses per year) of the researcher. This will be offset by the hiring of auxiliary staff.
- The provision of dedicated resources to the research unit to conduct strategic research projects: recruitment of doctoral students, administrative support, etc.

Researchers and their immediate teams benefiting from those measures will be selected upon CP. They should present a structured project detailing their scientific programme, international perspectives, activities carried in relation with companies and economic impacts, etc. They should also detail the expected impacts of such a programme on their research and unit in terms of excellence, international visibility, etc.

Axis 2: Ensuring performance of infrastructures

Action 11: IC West cooperation and communication digital infrastructure programme

Inside excellence perimeter			Outside perimeter	
COM	CP	<u>Transverse tool</u>	CP	<u>Transverse tool</u>

Goals & principles

This project builds upon the UEB C@mpus project. We propose to extend this project to both regions. The UEB C@mpus project aims to fund new facilities for distant research, education and innovation activities. These facilities will not only be created on existing sites, which will be adapted or extended, but also in 4 new buildings (2 in Brest and 2 in Rennes). These new buildings, which are aimed to be of innovative architectural design as well as being certified as being of high environmental quality, will house a concentration of high-technology facilities and services. They will also be places where all those involved in higher education and research, from both the public and private sectors, can meet and discuss. The Ministry of Higher Education and Research is giving funding of 30 million euros to finance these 4 buildings, the

construction of which will be the subject of a public- and private-sector partnership. The Brittany Regional Council and other local authorities are also giving up to 30 million euros to finance the purchase of facilities and services.

The project is expected to have a major and wide-ranging impact. Its effects will be felt in economic and environmental (the post-carbon age: reduction in the number of work-related journeys without adversely affecting work efficiency) terms as well as in the structuring of information systems, and innovations in teaching tools and methods for both initial training and for life-long learning by a combination of synchronous and asynchronous methods. Finally, it will strengthen the international brand image of the UEB member establishments and the brand image of “Brittany, the ICT (information and communication technologies) region”. The first phases of facility and service installation have taken place since late 2009. Subsequent phases will then be spread out over a period of about 5 years.

Closing the “numeric distance” between the disseminated research and education sites of Western France will allow the main following goals to be reached:

- Strengthen synergies between laboratories, research platforms, researchers of the academic world, but also between the academic world and the economic and social work
- Offer better cooperation and coordination links between the graduate courses proposed by founders of IC West, between the students of these courses and between students and teaching staffs
- Offer a set of numeric documents, available for all actors of the academic world
- Sharing at the region scale job insertion initiatives for graduate of all education institutions
- Make cooperations between doctoral schools easier, as they all are multi-institutions and often multi-sites; this would enlarge the doctoral studies, and facilitate job insertion for PhD students
- Develop and value international visibility of our establishments, by increasing distant work and by broadcasting interactive conference happening in our regions
- Put our projects in a sustainable development perspective by being able to increase our activities and visibility while reducing travel of students and teachers.

In summary, this project is paramount for the long-term objective of IC West, the advent of a unique, decentralised, networking university system in Western Europe.

Means & implementation

Research and Higher Education institutions in Brittany have already have access to a substantial infrastructure regularly cited as an example (e.g. for its immersive rooms). Most of the funding dedicated to this action will be brought by partners from Pays de la Loire, including a significant portion by the local authorities of this region. A budget of € 10 million over 4 years will be mobilised for the deployment for this infrastructures across the whole of West.

**APPEL A PROJETS
IDEX
CALL FOR PROPOSALS
IDEX 2 | PRE-SELECTION
PHASE**

Acronyme du projet / IC West

**DOCUMENT DE SOUMISSION /
SUBMISSION FORM**

An evaluation of existing needs will be completed in 2012 and priorities will be established for the period 2012-2015.

Action 12: “Performing campus” programme	Inside excellence perimeter			Outside perimeter	
	COM	AAP	<u>Transverse tool</u>	AAP	<u>Transverse tool</u>

Objectives & principles

Action 12 is oriented towards a very ambitious programme mainly funded by local authorities, aiming at establishing Campus at international standards for major university sites of Western France.

This project will be developed in strong cooperation with local authorities (main metropolis, but also region communities). Therefore, the actual development of such an action will take various forms depending on the sites. In general, the programmes will concern the following topics:

- Developing a very high-level service for welcoming foreign students or researchers
- Develop added value services (learning centres, numerical resources)
- Create “packages” for researchers of exceptional level
- Sharing management infrastructure for the institutions of a same site.

The short-term goal of these actions will be to attain, after 4 years, strongly integrated, highly attractive, and very efficient research and education structures.

Means & implementation

This will be deployed on the basis of an inventory conducted during the second period of implementation of IC West and of the definition of a 3-year programme.

2.4. GOVERNANCE, ORGANIZATION AND MANAGEMENT

2.4.1 EFFICIENCY AND AGILITY AS GOVERNANCE PRINCIPLES

The governance of IC West aims at reaching maximum efficiency and agility. Reasons to do so are firstly, to let actors of IC West (researchers, lecturers, support teams) concentrate on their real objectives, with the minimum of overhead; and secondly, that IC West will be an “experimental laboratory” for the emergence of a new, decentralized university system, and therefore, its governance has to be as flexible as possible in order to adapt to the numerous foreseeable changes that will take place in the next decade.

Agility is also needed to let the communities of IC West – in the Departments of Excellence, but also beyond these Departments – react as quickly as possible to the emergence of new concepts, new technologies, and new ideas, and be able to mobilise their forces on new issues by reconfiguring cooperation projects unhindered by unnecessary delays.

Actually, this will be a specific challenge of IC West to invent new modes of “scientific governance”, allowing “zero-overhead” for projects: the rapid spread of social networks usage

for research is, for example, acknowledged by the *Comin'Labs* Labex, which proposes to study and create the necessary tools and practices required to reach efficiency in cooperation.

To reach efficiency and agility, IC West will have a strong strategic and operational capacity based upon a simple governance, a strategic road map for the full IDEX, financial means oriented towards focused actions of the excellence perimeter in priority, a strong autonomy of the departments, and finally, a strong and agile bottom-up innovation process of the scientific community.

2.4.2 OVERALL ORGANISATION OF THE GOVERNANCE

The governance of IC West is shown in the following picture. IC West will have the status of a “*fondation de coopération scientifique*” (FCS), with a Governing Board and a Strategic Committee. An executive committee will be organised around an executive director, in direct relationship with the Departments of Excellence and with the IC West support missions dedicated to specific transverse tasks of IC West (international reputation, innovation in teaching practices, etc.). The Governing Board will be assisted by a financing committee and an audit committee.

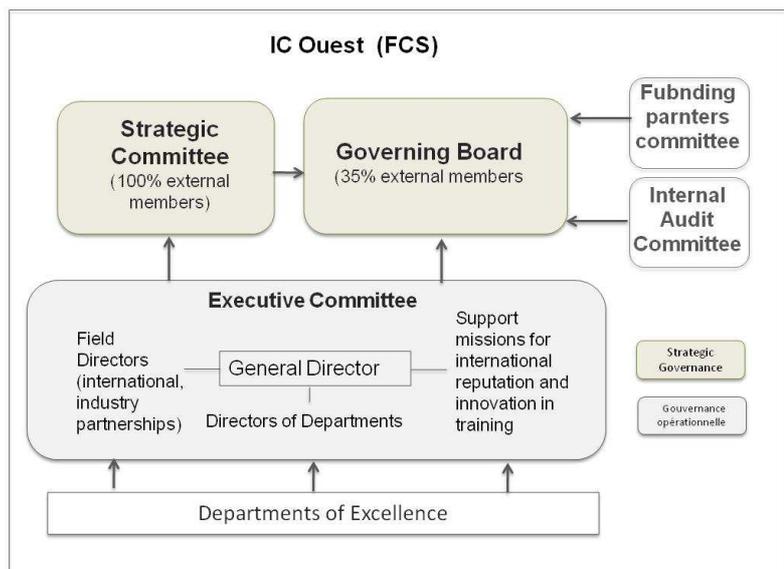
The strategic governance

It relies upon two committees: the Governing Board, and the Strategic Committee.

The Strategic Committee (SC) is composed of 10 external members, proposed by the founding members of IC West, and elected by the Governing Board.

The role of the SC is to evaluate IC West scientific activity: its overall scientific strategy, its main scientific projects, and its strategic road map. The opinion of the SC will be required prior to validating contracts on objectives and means (COMs) necessary for funding the actions of each Department.

The SC will also validate the responses to calls for proposals issued by IC West, after these proposals are evaluated by external experts, under the responsibility of the executive committee.



The SC is therefore the reference for guaranteeing that IC West reaches excellence at the international level. The SC will meet once a year on average, but its opinion may be sought more frequently on specific topics.

The Governing Board comprises 20 members: 13 representatives of the founding members, and 7 external personalities. The proposed composition of the founding members is 3 representatives for the main universities (*Université de Rennes 1, Université de Nantes, Université de Bretagne Occidentale*), 3 for the *grandes écoles* that most contribute to the Departments of Excellence, 4 representatives for research organisms (CNRS, IFREMER, INRIA, INSERM), 1 representative of the scientific community, and 2 representative for UNAM and UEB PRES.

Representatives of local authorities are permanently invited to attend the Governing Board, without power of decision. The *Recteur d'Académie* (regional representative of the French Ministry of Education) of the city, headquarter of the FCS, will also have a permanent seat on the Governing Board. The Governing Board decides IC West budget, guarantees the coherency of its activities, and decides on the global strategy. In practice, this Governing Board will be IC West main decision-making body. It:

- Votes on the creation of the Departments of Excellence,
- Validates the Contracts of Objectives and Means of the Departments of Excellence following a review of their strategic project and recommendations by the Strategic Committee,
- Allocates IDEX funding to the Departments' Contracts of Objectives and Means,
- Allocates IDEX funding to support actions implemented through IC West calls for proposals after (i) certification of projects by the executive committee on eligibility criteria and relevance, and then (ii) scientific evaluation by independent experts.
- Assesses the maturity of the thematic areas of excellence whose maturation is accompanied by IDEX under priority no 3.

It will also build a formal Funding Partners Committee composed of representatives of local authorities (Regional Councils, General Councils, "*pays*" (local districts)) which will be formally mobilised three times a year by the Board to discuss IC West direction and results. In this sense, communities will contribute to the consolidation of IC West strategy, beyond their financial support proper.

An external Audit Committee examines and certifies IC West accounts on the basis of an annual report prepared by the Executive Committee and approved by the Governing Board.

Operational governance

The **executive committee** (EC) comprises less than 10 members: the executive director of IC West, nominated by the Board, the executive director of the Department of Excellences, and functional directors (for each specific activity centre of IC West, such as graduate schools, international affairs etc.).

The EC implements IC West strategy and actions, organises the evaluation of its activity, and coordinates the activity of the Department of Excellences. The role of the departments' directors is specifically to help the departments' scientific directors with administration matters (finances, reporting, human resources, etc.).

Governance of the Departments of Excellence

Departments shall be created by decision of the Governing Board, upon presentation of a strategic project that shows how the Department proposes to reach the main missions assigned by IC West. When created, a contract of objectives and means (COM) is signed between the Department and IC West. All contributing institutions of the Department sign this COM that defines their contribution in terms of financing, human resources, and more generally, of means that they are committed to mobilise to achieve the objectives of the Department. In particular, the COM should mention explicitly which institution recruits the personnel needed by the Department.

The governance of a Department is left to the decision of its scientific director, with the help of the delegate director. However, it must be approved by the Board. Thus, depending on the excellence fields, it is anticipated that each Department of Excellence will discover a method of organisation that most suits its specific objectives. If necessary, guidelines regarding this matter could be defined and validated by the Board upon a proposal by the executive committee, as part of the rules and regulations of the FCS.

Indeed, IC West strategic governance will give a large degree of freedom to the Head of the Department of Excellence, within the framework defined by an ambitious strategic project evaluated and validated by international experts. Freedom will be left for appropriate decisions and actions to be made regarding the detailed allocation of funding. In counterpart, if the objectives of the contract are not reached, funding will be suspended. A great importance will be given to IC West strategic governance to validate and/or orientate the Department's project, as well as to define a general strategy to which all Departments must adhere. This autonomy will also concern the implementation of human resources and career management.

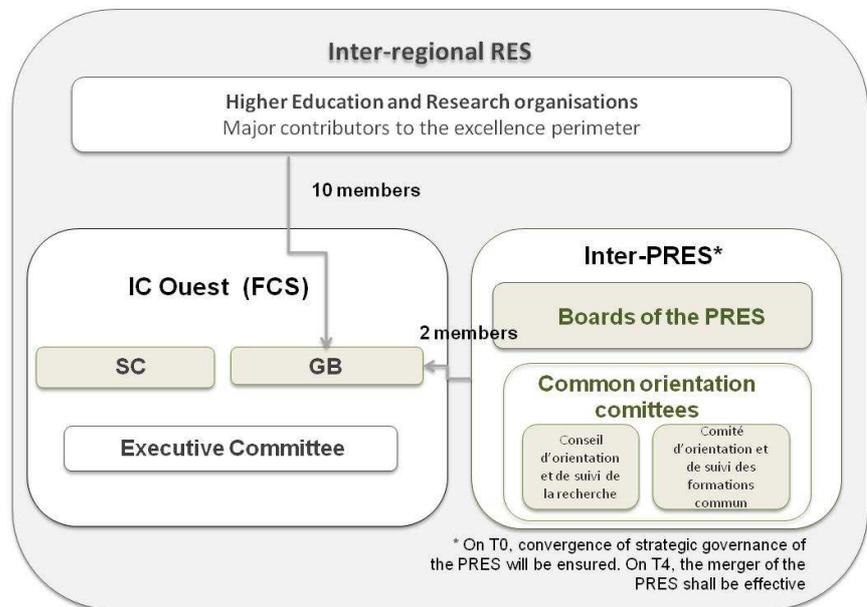
2.4.3 THE TRANSFORMATION MODEL OF IC WEST

The transformation effects of IC West are guaranteed at three levels:

- Maturation of scientific thematic centres until they become Departments of Excellence,
- Internal dynamics of attractiveness of excellence both at the inter-regional and international level,
- Dissemination and spill-over effects through cross levers within and outside the excellence perimeter.

The presence of the founding members and PRES in the Governing Board also ensures both the consistency of and the support for actions in research, education and innovation carried out by the Departments and it also guarantees the dissemination of the spill-over effects.

IC West also encourages the RES dynamics at the inter-regional level, materialised by an intense inter-PRES activity at T0 and by the creation of a joint Strategic Committee. Over the next 4 years, a strong process of coordination in the areas of training, graduate schools, etc., will be set up for an eventual merger of the two PRES at the end of this 4-year period.



Emergence of major Thematic Poles

This concept of Thematic Pole is the key in our strategy to progress towards a networked university system.

In accordance with the notion of Departments of Excellence that is to be found in the IC West project, the actors of the PRES will start a work focused on improving the organisation of Thematic Poles based on the Departments of Excellence of IC West, in order to progressively integrate research, education and innovation in common structures.

The overall goal of these Thematic Poles will be to federate the efforts in research, teaching and economic and societal development over the whole Western area, to have the actors develop a common strategy aimed at international recognition at the highest level, and to carry out actions implementing this strategy.

This dynamic will pursue the following objectives. In research: (i) to coordinate the research of existing laboratories in order to strengthen them and to create new research teams, (ii) to increase the scientific potential of the laboratories by attracting new researchers, and by organising actions to enforce their international visibility, (iii) to facilitate the emergence of transverse and multidisciplinary cooperative research projects, (iv) to provide laboratories with a strong support to answer calls for proposal, especially at the European level, (v) to coordinate the creation and maintenance of scientific platforms and major scientific facilities, and (vi) to organise major scientific conferences and events.

In education: (i) to coordinate the curricula of all institutions in the particular field of the Pole and to contribute to its enlargement and its effectiveness, (ii) to develop a common education offer at the international level, and (iii) to support innovation in teaching methods.

In the economic and societal fields: (i) to develop interactions with the economic world, in particular with competitiveness clusters, IRTs and IEEs where they exist, and (ii) to develop the transfer of knowledge towards the economic sector and society.

Such a panel of actions constitute a true incubation activity for new research teams, new education programs and more generally, new fields for the western RES. Thematic Poles will cover the full extent of scientific fields and *grandes écoles* in Western France, taking into account the existing organisation of our RES, and whilst keeping a strong coherency with IC West.

Doctoral studies

Pays de la Loire has more than 2,300 PhD students, belonging to 9 doctoral schools, and Brittany has more than 2,700 PhD students, belonging to 8 doctoral schools. In 2009, 950 PhD theses were awarded in both regions. Of these 17 doctoral schools, 16 were ranked A or A+ by AERES in 2011. 7 of them are in the field of human and social sciences, 3 in life sciences, 5 in science and technology, and 2 are multidisciplinary.

The coordination of doctoral studies is already a mission of both L'UNAM and UEB, and therefore, synergies and mutualisation can very rapidly start in the framework of a convergence of the PRES. Joint actions to increase the attractiveness of our doctorates could easily be organised, by completing those that already exist inside each PRES. Doctoral studies is indeed one of the strategic fields to organise the convergence of activities in both PRES.

In the short term, priorities are to increase the readability and the attractiveness of doctoral programs that fall specifically under the scope of the Thematic Poles, and to coordinate the doctorate schools that have an intersection with the scientific domain of each Pole.

In the middle term, reorganising the doctoral schools will aim to build thematic doctoral schools at the scale of both regions. Some of these doctoral programmes will be attached to a Department but our choice is not to separate doctorate programmes in or out of IC West in different doctorate schools, so as to maximise the transformation effects of the IDEX. Only those doctoral programmes that are attached to a Department will be funded by the IDEX.

Towards a Digital University

In our approach, building a numerical university is a key lever to organise convergence. Achieving a digital infrastructure for all members of the RES in Pays de la Loire and Brittany is an absolute necessity for the success of IC West, and in the long term, for the success of the "research – education – innovation" logic that underpins the IC West project. Indeed, this step is an answer to the need for exchanges and for cooperation that IC West represents on the

large territory of the two regions. This mission belongs clearly to the PRES. Since the evolution of communication technologies is tremendous, this represents a challenge that UEB, for its part, has put at the heart of its development strategy. It will constitute one big challenge for IC West and for the whole RES of Western France.

Organising the convergence of the L'UNAM and UEB PRES structures

In early 2012, both PRES will revise their internal procedures in order to merge their scientific committees, to create a common committee for doctoral studies, and to organize a participation of all the members of their Strategic Committees. The goal of these new procedures is to allow convergence to happen between the research and the doctoral studies in the two regions. It is to be noted that industrial transfer is already coordinated within the framework of the West valorisation SATT.

Beyond these organisational structure changes, both PRES will harmonise their missions and their modes of operation. This process will lead to the merge of both PRES and to the creation of a new organisation covering the western region within the first 4 years period. This new organisation will be the basis to envision and develop the networked university system.

2.4.4 PROJECT ORGANISATION

Resource allocation system

The strong structuring of IC West in Departments of Excellence induces a logic of empowerment and delegation. That is why actions 1 and 2 will be implemented within the framework of COM with the Departments of Excellence.

Overall, four differentiated modes of resource allocation will be used with a priority for pragmatism and performance. The table below synthesizes this organization:

Allocation modalities	Actions	% IDEX grant (outside governance)
Contracts on Objectives and Means (COM)	Actions 1 and 2	55 %
Calls for proposals (CP)	Actions 5, 6, 8 and 10	20%
Transverse missions	Actions 3 and 7	5%
Others	Actions 4, 9, 11 and 12	20%

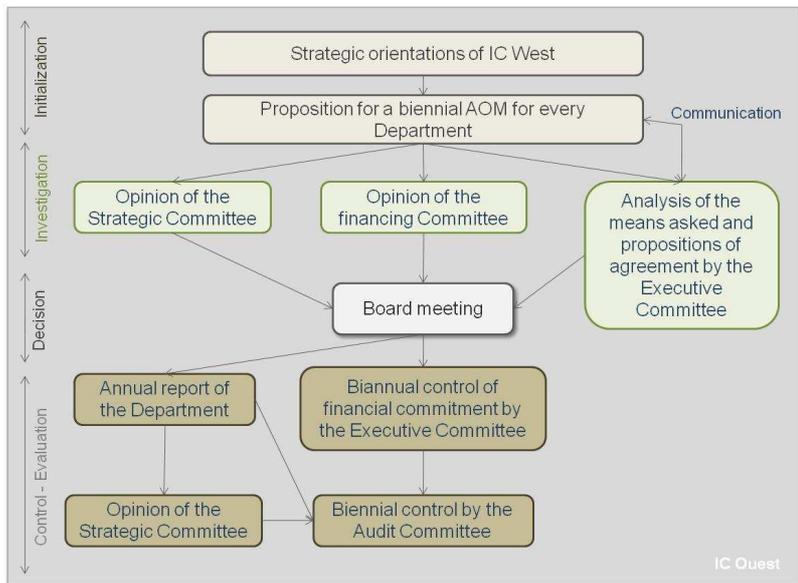
Calls for proposals will be preferred each time competition can be a key factor of success and reactivity is not the absolute priority. Thus, action 4 “Industrial chairs and joint public-private laboratories” will not be managed by a CP, since the ability to seize opportunities, and especially to transform them into sustainable partnerships involving a strong reactivity, are essential here, even if they have to be compatible with a real strategic management. The figure below illustrates the process for elaborating the Agreement on Objectives and Means for Department of Excellence of IC West.

**APPEL A PROJETS
IDEX
CALL FOR PROPOSALS
IDEX 2 | PRE-SELECTION
PHASE**

**Acronyme du projet / IC
West**

**DOCUMENT DE SOUMISSION /
SUBMISSION FORM**

This process, through its biennial timing, allows the Departments to follow a logic of commitment. On the other hand, since it requires the opinions of the Strategic Committee and the financing Committee, it is a transparent process. The schedule of IC West, presented in the table below, is broken down in the schedule for the initial phase, followed by an overall schedule over 10 years with IC West main milestones and commitments.



Schedule of the initial phase:

Half-year 1	Half-year 2	Half-year 3
-implementation of the FCS + Governance + Transverse missions -strategic Committee Meeting -creation of the Departments -Labex fund (Action 1)	-implementation of the Departments and 12 month budget allocation -implement of the Agreements on Objectives and Means -preparation of the CP for Actions 5, 8 and 10 and for the CP managed by the transverse missions -“performing campus” program for 3 years -implementation of all the actions	- realization of key international partnership agreements

Global schedule over 10 years is:

Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10
Initial phase (cf. detailed schedule)									
Validation of the strategic road map of the Departments for 4 years									
Development and Departments validated at T1									
Deployment of all of the actions									
External audit of the actions (except COM)									
Dialogue on the potential of evolution of the excellence perimeter									
Evaluation on: - mid-term assessment of Departments validated at T1 - examination of the propositions of the excellence perimeter - revision of the portfolio of actions									
Commitment of the 2nd phase of IDEX									

Overall, the deployment of IC West will take place in 3 phases and 1 key step: (i) an initial phase of implementation and structuring, (ii) a phase of deployment of the actions and development of Departments validated at T1, (iii) a key step evaluation for a possible revision of the portfolio of actions and an evolution of the perimeter of actions, (iv) a phase of stabilization.

2.5. MEANS

2.5.1 JUSTIFICATION OF THE CONCENTRATION OF THE MEANS ON THE EXCELLENCE PERIMETER

IC West builds on very large Labex. These Labex are at the heart of the dynamic evolution of the Departments, and spearhead IC West attractiveness and reputation. Institution partners of IC West have thus decided to commit a significant part of their financial contribution (approximately 60%) to funding the Labex. The assigned means reflect this strategic choice. IDEX resources will be split as follows:

- Contributions of the partners from their own budget : 85 % on the excellence perimeter, of which 60 % for Labex,
- IDEX grant: 85% on the excellence perimeter, of which 30% for Labex,
- Resources from local authorities: 56% on the perimeter of excellence.

Finally, the perimeter will concentrate 80% of the total resources, of which 60% will be on axis 1 of Priority n°1 "Creating Departments of Excellence with international position".

2.5.2 JUSTIFICATION OF THE REQUESTED MEANS IN CONNECTION WITH THE STRATEGY, THE OBJECTIVES AND THE DYNAMICS

IC West objectives are two-fold:

- On the one hand, to make Departments of Excellence international magnet for talents that are comparable with the best institutes worldwide.
- On the other hand, to favour innovation in all its forms.

The first objective is supported by axis 1 of Priority n°1, receiving 60 % of the planned means, a significant part of which is ensured by contributions of IC West funding partners. Axis 2 of Priority n°1 "Developing international research partnerships" will contribute to the attractiveness of Departments through the development of research partnerships. Nevertheless, the initial budget planned for this axis is limited (4 M€ a year) because it is an incentive budget for the implementation of international industrial chairs and joint laboratories completed by budgets from partners, including companies. The number of annual new projects related to this action should be of the order of 2 or 3.

The second priority "Making innovation a driving force of IC West" receives almost 20% of the IDEX grant. This second priority is based on three specific actions targeted on innovation and experimentation in education, new approaches for innovation (e.g. living labs), etc. As for the international industrial chairs, funding of these actions must be understood as incentives for experimentation, educational entrepreneurship, etc.

Funding assigned to the 3rd Priority is significant - almost 22 M€ a year - but only 14% from the IDEX grant is mobilised, because local authorities will bring a strong support (60% of funding on this priority) specifically for the development and the performance of infrastructures. Funding

for Action 8 "Supporting the convergence of the research programs" of this 3rd priority (outside will be completed by local authorities in a perspective of maturation towards the excellence.

2.5.2 THE PRINCIPLES OF COFINANCING AND THE MOBILISATION OF THE EXTERNAL RESOURCES

All of the universities and *grandes écoles*, research institutes, PRES and the local authorities have agreed on the necessity of a balanced support for the whole portfolio of actions, with a distribution of 1/3, 1/3 and 1/3 between funds resulting from the IDEX funding, partners' contributions from their own budgets, and external resources from the local authorities.

Some actions make an exception to this principle:

- Action 1 *Fund Labex* for which contributions of participating universities, *grandes écoles* and research institutes represent 80% of the funding,
- Action 4 *Industrial chairs and joint public-private laboratories* for which external resources will be constituted from contributions of both the industrial partners and local authorities,
- Action 12 "*Performing Campus*" Programme, to which local authorities will contribute at the level of 60%.

With the exception of action 12, a large majority of the funding will be managed by the IC West FCS in charge of mobilising the necessary co-funding, in particular with local authorities. Regarding actions involving companies, such as actions 2 or 3, an agreement including financial commitments will systematically be concluded.

2.6. HUMAN RESOURCES

2.6.1 HUMAN RESOURCES WITHIN THE PROJECTS AND PERSPECTIVES

As discussed above, IC West will significantly contribute to the integration of transverse processes, the creation of pooled structures, and the development of standards and common tools. In terms of human resources, management amongst institutions will be strongly aligned and integrated. The establishment of a coordinated organization of IC West human resources policies will go through the construction of harmonized processes for the recruitment of teachers and researchers within the perimeter of excellence and then integrated management of human resources in the IDEX.

IC West intention is to address two major issues related to the rise in human resources, service excellence and attractiveness of the IC West perimeter of excellence:

1. Recruitment of talents at a national and international level,
2. Career management to retain the longest possible talents in our territories.

An important point of this component will include support for the internationalisation of career and skills development of researchers.

Recruiting new talent and supporting the rise of Departments

The favoured channel for recruitment within IC West will be higher education and research institutions, founder of IC West who will establish a structured policy for recruitment in order to allow an increasing number of researchers within the excellence perimeter of about 10% over 4 years. This represents an increase of about 35 researchers per year and involves the following processes:

- The redeployment on the excellence perimeter of about 7% of vacancies due to retirement. The contributors to this measure are the founding institutions and national research institutions of IC West.
- The inner attraction to the perimeter of excellence through a converting scheme to specific themes based on :
 - o "Training leave" up to 2 years with an adaptation of teaching workload with (up to two thirds) for the whole duration of the leave
 - o An operating grant for the beneficiary's discharge (€ 10k, for example)

The recruitment of auxiliary staff will help offset reductions of teaching hours.

The recruitment of foreign talent will also be secured by allocating attractive packages including: salary, recruitment of PhD students, administrative support, equipment, etc. It is anticipated that eight packages of € 500K per year over 4 years (2 per department) will be funded. These measures are developed within the IC West Priority n°2.

The second channel for recruitment is composed of the Departments of Excellence who will have the autonomy to recruit and manage contractual staff within the excellence perimeter. In this perspective, recruitment necessary for the Department's research programme will be organised by the Director of each Department. Recruited staff will be attached to a specific institution, particularly active in the research project concerned.

Managing talents

Management will focus on the supply to promising researchers (inside or outside of the perimeter) of preferential and attractive research conditions. This will include 4 dedicated measures:

- The adaptation of the teaching workload (with a ceiling of 42 hours of courses per year). This will be offset by the hiring of auxiliary staff,
- The provision of dedicated resources to the laboratories to conduct research projects, especially outside of the perimeter: the recruitment of doctoral students, administrative support, etc. (cf. Action 12),
- Support for internationalisation of careers through the support mission for international reputation that will help researchers and laboratories in their international strategies and actions such as involvement in seminars and conferences, visits to foreign institutions, international partnerships, etc.
- The establishment of a continuing training system for researchers.

Department Directors will play an important role in career management and detection of talents in the laboratories of the Departments of Excellence and also outside the perimeter, in close research teams.

3. KEY DATA AND FINANCIAL PLANNING

Table 1: Proportion of faculty and students involved in the excellence Initiative

Tableau 1.1	Périmètre d'excellence / Excellence perimeter	Ensemble des partenaires du groupement / All partner institutions of the Idex
Nombre d'Enseignants chercheurs et chercheurs permanents / Number of academics	1,281 *	5,279 *

*Full time Equivalent

Tableau 1.2	Etudiants bénéficiant des actions de formation de l'Idex / Idex training programs students	Ensemble des étudiants des partenaires du groupement / All Idex partners students
Nombre d'étudiants⁹ / Number of students	4,573 Master Degree, Graduate School and PhD students benefiting from actions centered on the excellence perimeter 11,489 Master Degree, Graduate School and PhD students benefiting from actions centered on the excellence perimeter and actions outside the excellence perimeter	24,856 Master Degree, Graduate School and PhD students

⁹ Les actions de formation de l'Idex sont celles présentées dans le projet de l'Idex au paragraphe 3.3 / The Idex training programs are the ones described in the Idex project in paragraph 3.3.

**APPEL A PROJETS
IDEX
CALL FOR PROPOSALS
IDEX 2 | PRE-SELECTION
PHASE**

**Acronyme du projet / IC
West**

**DOCUMENT DE SOUMISSION /
SUBMISSION FORM**

Table 2: Capital grant requested (in millions of euros)

Dotation en capital demandée / Capital grant requested	738,881
Montant de référence annuel des intérêts perçus sur la dotation (sur la base d'un taux de 3.413%) / Yearly expected interests from the capital grant (based on a 3.413% rate)	25,218

Table 3: Presentation of the resources and expenses of the actions of the perimeter of excellence of the IDEX – total over 4 years (in millions of euros).

Nom de l'action / Action	Ressources / Resources				Dépenses / Spending		
	Subvention IDEX / IDEX grant	Autres subventions Investissements d'avenir / Other grants related to « Investissements d'avenir »	Apport des partenaires du groupement sur leur budget propre / Contribution of all partner institutions of the IDEX based on their own budget	Ressources externes / External resources	Investissements dont immobilier / Investments including real estate	Fonctionnement / Operating costs	Personnel / Staff
1: Fund Labex	32,000		216,000	0,000	32,240	42,160	173,600
2: Strategic project	24,000		24,000	24,000	18,000	18,000	36,000
3: International reputation	1,600		1,600	1,600	0,000	2,400	2,400
4: Industrial chairs	4,000		4,000	8,000	8,000	4,000	4,000
5: Innovation approaches	4,000		4,000	4,000	1,200	4,800	6,000
6: Research projects	5,600		5,600	5,600	8,400	4,200	4,200
7: Innovation in pedagogy	2,000		4,000	2,000	0,800	3,200	4,000
11: IC West communication infrastructures	2,000		1,000	2,000	3,250	1,250	0,500
12: Performing Campus	4,000		4,000	8,000	16,000	0,000	0,000
Governance and GC (4%)	6,336		3,856	3,776	0,000	6,984	6,984
TOTAL	85,536		268,056	58,976	87,890	86,994	237,684

**APPEL A PROJETS
IDEX
CALL FOR PROPOSALS
IDEX 2 | PRE-SELECTION
PHASE**

**Acronyme du projet / IC
West**

**DOCUMENT DE SOUMISSION /
SUBMISSION FORM**

Table 4: Presentation of the resources and spending of the other Idex actions - total over 4 years (in millions of euros)

Nom de l'action / Action	Ressources / Resources				Dépenses / Spending		
	Subvention Idex / Idex grant	Autres subventions Investissements d'avenir / Other grants related to « Investissements d'avenir »	Apport des établissements partenaires du groupement sur leur budget propre / Contribution of the Idex partners based on their own budget	Ressources externes / External resources	Investissements dont immobilier / Investments including real estate	Fonctionnement / Operating costs	Personnel / Staff
5: Innovation approaches	2,000	0	2,000	2,000	0,600	2,400	3,000
6: Research projects	2,800	0	2,800	2,800	4,200	2,100	2,100
7: Innovation in pedagogy	1,000	0	2,000	1,000	0,400	1,600	2,000
8: Convergence	4	0	4	4	0	12	0
9: International coaching	0,400	0,000	0,400	0,400	0,000	1,200	0,000
10: Promising talents	2,000	0,000	2,000	2,000	0,000	6,000	0,000
11: IC West communication infrastructures	2,000	0,000	1,000	8,000	7,150	2,750	1,100
12: Performing Campus	0,000	0,000	12,000	24,000	36,000	0,000	0,000
Governance	1,136	0,000	1,048	1,616	0,000	1,900	1,900
TOTAL	15,336	0,000	27,248	45,816	48,350	29,950	10,100

Table 5: Total budget over 4 years – resources and spending (in millions of euros)

Pour des considérations de mise en page, le tableau 5 est séparé en plusieurs sous-ensembles. On trouvera en page 20 des indications sur les éléments à préciser dans le tableau.

	Ressources mobilisées pour les actions du projet d'Idex / Resources mobilized for the actions of the Idex project	Total des ressources des établissements partenaires de l'Idex / Total of the resources of the Idex partners
Financements apportés par les Investissements d'avenir (A) et (B)		
Investissements d'avenir : montant de l'aide demandée au titre de l'IDEX (A) / Investissements d'avenir : amount of the requested funding for the Idex (A)	100,872	Sans objet
Autres financements dans le cadre des Investissements d'avenir pouvant concerner l'IDEX (B) / Other fundings within Investissements d'avenir which could affect the Idex (B)	Cf. note below, b1, b2	Sans objet
Financements obtenus (b1) / Funding obtained (b1)	Cf. note below	Sans objet
Financements en attente (1^{ère} et 2^{ème} vague) (b2) / Pending fundings (1st and 2nd wave) (b2)	Cf. note below	Sans objet

Note:

*b1: Funding obtained for 2 selected Labex are 14.939 M € for 4 years. Other funding has already been obtained for the Labex STOREX and Demonstrator PGN, but these funds are for national operations whose distribution is not definitive. Definitive funding of the IRT Jules Verne is about to be confirmed.
b2: It is difficult to precisely estimate all Pending funds corresponding to the 1st and 2nd waves of Investissements d'Avenir because many of those projects are national operations. For the financing plan, pending fundings (1st and 2nd waves) have been estimated to € 17M for 4 years.*

**APPEL A PROJETS
IDEX
CALL FOR PROPOSALS
IDEX 2 | PRE-SELECTION
PHASE**

**Acronyme du projet / IC
West**

**DOCUMENT DE SOUMISSION /
SUBMISSION FORM**

Apports des établissements d'enseignement supérieur du groupement constituant l'Idex / Contribution of the higher education Idex partners (C)		
Univ. Rennes 1	47,249	1121,144
UBO	35,436	684,548
Université de Nantes	35,436	1135,416
Ecoles	70,873	615,222
Total	188,995	1121,144

Apports des Organismes de recherche du groupement constituant l'Idex / Contribution of the research institutes within the Idex partners (D)		
INRIA, IFREMER, CNRS for the support of the 2 selected Labex	46,158	
CNRS, IFREMER, INSERM, INRIA for the support of the rest of IC West actions	42,793	
IFREMER		819,800
CNRS		355,704
INRIA		113,964
INSERM		144,564
Total	88,951	1434,032

Apports des autres partenaires du groupement constituant l'Idex / Contributions of other partners (E)		
Contributions of other partners for the support of the 2 selected Labex	5,318	
Contributions of other partners (PRES UEB & L'UNAM and others higher education and research institutes) for the support of the rest of IC West actions	12,400	
Total	17,718	

**APPEL A PROJETS
IDEX
CALL FOR PROPOSALS
IDEX 2 | PRE-SELECTION
PHASE**

Acronyme du projet / IC West

**DOCUMENT DE SOUMISSION /
SUBMISSION FORM**

Apports des collectivités territoriales / Contribution of the territorial authorities (F)		
Région Bretagne	30,237	Sans objet
Région Pays-de-la-Loire	30,237	Sans objet
Autres collectivités territoriales bretonnes	20,158	Sans objet
Autres collectivités territoriales ligériennes	20,158	Sans objet
Total	100,792	Sans objet

Apports des entreprises / Contribution of the private sector (G)		
International Partners	4,000	Sans objet
Total	4,000	Sans objet

TOTAL (I)		
TOTAL des ressources mobilisées pour les actions du projet d'Idex / Total of the resources mobilized for the actions of the Idex project	500,968	Sans objet

Table 6: Distribution of the expenses according to the nature of the 4 year budget (in millions of euros)¹⁰

	Aide demandée au titre de l'Idex / Requested funding for the Idex	Ressources mobilisées pour les actions du projet d'Idex / Resources mobilized for the actions of the Idex project
Ressources humaines (incluant les personnels permanents) / HR (including permanent staff)	49,556	198,227
Équipement / Equipment	20,848	115,392
Fonctionnement / Operating costs	30,467	86,476
Total	100,872	400,096

¹⁰ (a') du tableau 6 doit être égal à (a) du tableau 5
(i') du tableau 6 doit être égal à (i) du tableau 5

(a') in table 6 must be equal to (a) in table 5
(i') in table 6 must be equal to (i) in table 5

Tableau 7 : Répartition des dépenses par activité du budget sur 4 ans (en millions d'euros)

	Aide demandée au titre de l'Idex / Ressources mobilized for the actions of the Idex project	Ressources mobilisées pour les actions du projet d'Idex / Ressources mobilized for the Idex project
1: Fund Labex	32,000	216,000
2: Strategic project	24,000	48,000
3: International reputation	1,600	3,200
4: Industrial chairs	4,000	12,000
5: Innovation approaches	6,000	12,000
6: Research projects	8,400	16,800
7: Innovation in pedagogy	3,000	9,000
8: Convergence	4,000	8,000
9: International coaching	0,400	0,800
10: Promising talents	2,000	4,000
11: IC West communication infrastructures	4,000	12,000
12: Performing Campus	4,000	48,000
Base 8% (4% GC +% governance)	7,472	10,296
Total	100,872	400,096

**APPEL A PROJETS
IDEX
CALL FOR PROPOSALS
IDEX 2 | PRE-SELECTION
PHASE**

**Acronyme du projet / IC
West**

**DOCUMENT DE SOUMISSION /
SUBMISSION FORM**

Pour chaque établissement, porteur ou partenaire de l'Idex, joindre un exemplaire du présent document signé ci-dessous, accompagné d'une lettre de positionnement stratégique et d'engagement de cet établissement, précisant la contribution de l'établissement au budget global présenté en termes de ressources humaines, équipements spécifiques, budget de fonctionnement, et, éventuellement, mise à disposition de l'immobilier.

L'ensemble est à faire parvenir le 13 octobre 2011 à minuit au plus tard, la date et l'heure de réception faisant foi, à l'adresse suivante :

engagements-idex@agencerecherche.fr

Etablissement :

Prénom :

Nom :

Qualité :

Ayant le pouvoir d'engager juridiquement l'établissement ci-dessus, je déclare:

- avoir pris connaissance du dossier de sélection du présent projet et du règlement relatif aux modalités d'attribution des aides « Initiatives d'excellence » et souscrire aux obligations qui en découlent, notamment à des fins d'évaluation globale de l'action ;
- m'engager à mettre en œuvre tous les moyens nécessaires à la réalisation du projet dans les conditions prévues par le règlement relatif aux modalités d'attribution des aides « Initiatives d'excellence ».

Date :