

<b>Acronym of the project</b>	<b>UNITI</b>
<b>Titre du projet en français</b>	Université de Toulouse
<b>Project title in English</b>	University of Toulouse
<b>Project manager</b>	Name : Gilbert Casamatta Contact information: Marie-France Barthet <a href="mailto:Marie-France.Barthet@univ-toulouse.fr">Marie-France.Barthet@univ-toulouse.fr</a> Phone : +33683124837
<b>Institution leading the project (Project leader)</b>	Name : PRES Université de Toulouse (Pôle de Recherche et d'Enseignement Supérieur)
<b>Capital grant requested M€</b>	<b>1 340 M€</b>

## Structure of the IDEX partnership

Higher Education and Research Establishments	Research institutes	Other
<b>UT1</b>	<b>CNRS</b>	<b>CHU</b>
<b>UT2</b>	<b>INSERM</b>	<b>ICR</b>
<b>UT3</b>	<b>INRA</b>	
<b>INPT</b>	<b>IRD</b>	
<b>INSA</b>	<b>ONERA</b>	
<b>ISAE</b>	<b>CNES</b>	

<b>1.</b>	<b>TABLE OF CONTENTS .....</b>	<b>3</b>
<b>2.</b>	<b>OPERATIONAL MEASURES .....</b>	<b>4</b>
<b>3.</b>	<b>EXECUTIVE SUMMARY .....</b>	<b>19</b>
<b>4.</b>	<b>DELTA DOCUMENT .....</b>	<b>29</b>
<b>5.</b>	<b>DETAILED DESCRIPTION OF THE PROJECT .....</b>	<b>38</b>
5.1.	Ambition and strategy of the project.....	38
5.2.	Structure and characterization of the Initiative of Excellence.....	39
5.2.1	Presentation of the project leader (including the legal status)	39
5.2.2	Application to the actions of the programme « Investissements d’avenir »	48
5.2.3	Excellence perimeter, environment, prospects and added value	54
5.3.	Project and prospects.....	57
5.3.1	UT Pact	57
5.3.2	IDEX programmes in favor of the perimeter of excellence in research	60
5.3.3	Selection procedure for the IDEX programmes	66
5.3.4	Performance measures in research and milestones	69
5.3.5	Training	72
5.3.6	Campus life	79
5.3.7	International relations policy of UT	80
5.3.8	Development of results and socio-economic partnerships	82
5.4.	Governance, organization and management .....	85
5.4.1	The structure of the University of Toulouse in 2018	85
5.4.2	The transitional process 2012-2017	89
5.4.3	Auditing procedure	92
5.5.	Means.....	93
5.6.	Human Resources.....	96
<b>6.</b>	<b>KEY DATA AND FINANCIAL PLANNING .....</b>	<b>98</b>

## 1. TABLE OF CONTENTS

1. Table of contents	3
2. Operational rules	4
A. Perimeter of excellence	4
B. Four-year target and expected risks	8
C. Operational measures and corresponding timeline	15
3. Executive summary	19
A. French version	19
B. English version	24
4. Delta document	29
A. Characteristics of the unified UT	29
B. Replies to the questions and recommendations of the jury	34
5. Detailed description of the project	38
5.1. Ambition and strategy of the project	38
5.2. Structure and characterization of the Initiative of Excellence	39
5.2.1 Presentation of the Project leader	39
5.2.2 Application to the actions of the programme “Investissement d’Avenir”	48
5.2.3 Excellence perimeter, environment, prospects and added value	54
5.3 Project and prospects	57
5.3.1 UT Pact	57
5.3.2 IDEX Programmes in favor of the perimeter of excellence in research	60
5.3.3 Selection process for the IDEX Programmes	66
5.3.4 Performance measures in research and milestones	69
5.3.5 Training	72
5.3.6 Campus life	78
5.3.7 International relations policy of UT	80
5.3.8 Development of results and socio-economic partnerships	82
5.4. Governance, organization and management	85
5.4.1 The structure of the University of Toulouse in 2018	85
5.4.2 The transitory process 2012-2017	89
5.4.3 Auditing procedure	92
5.5. Means	93
5.6 Human Resources	96
6. Key data and financial planning	98

## 2. OPERATIONAL MEASURES

### A. Perimeter of excellence

The ambition of the University of Toulouse (UT) is to boost the academic performances of all its components, in research and in higher education. A unified UT would currently rank 100 to 200 in the ARWU ranking of world universities, with large potential for improvement. Its target is to secure a position among the top 100 within the next 20 years.

The 94,000-student university will be twice as large as the largest prestigious universities around the world. Hence, UT recognizes that the leap forward will not be uniform. That is why UT will concentrate most of the IDEX funding on its perimeter of excellence, and will further reallocate a significant share of its own non-IDEX resources to it. UT's objective is to create a perimeter of excellence UT\* whose academic performances are similar to those of a mixture of public universities University of California at Los Angeles (UCLA, ranked 12<sup>th</sup> in ARWU) and University of Wisconsin at Madison (UW-M, ranked 19<sup>th</sup>). Thus, UT criterion for a research unit to join UT\* perimeter of excellence will be to rank accordingly in its own field. To sum up, UT goal is to belong to the top-100 league, and to nurture a virtual campus of excellence whose contributors will belong to the top 20 in their own field.

Several reforms described in this document have been shaped to attain these twin goals: Unification of the current institutions into the UT (implying a single signature in publications as a side-product), strong centralized governance meeting the best international standards, ability to reallocate financial resources and human capital towards the best performing units, radical transformation of recruitment processes (prohibition of inbreeding at junior level, fair competition insiders/outside, ...), efficient management of human resources (tenure-track, merit-based bonuses PES), five IDEX programmes concentrated on the promotion of excellence within the UT\* perimeter and on its emergence outside UT\*, efficient management of the evaluation of scientific production by an ERC-like external committee (GSE), ... Except for the unification under UT flag and for the ban of inbreeding, which will be gradual until full implementation in January 2018, all other reforms will be operational in 2012.

#### ***A dynamic process to build UT perimeter of excellence in research***

Some research units are already very competitive at the international level. Others have great potential and a credible action plan (selective recruitment, internal promotion of excellence, efficient governance...) to compete at the international level. Such units will be eligible to UT\*.

UT will actively support teams in UT\* by concentrating the IDEX funding on their development, and by offering leverage from its own human and financial resources. The Pact implemented by UT and its colleges specifies that UT\* teams will receive recurring funding from them. Funding will be based on scientific production and international rankings rather than on the size of the team. This funding should not become a vested right: The excellence of labeled research teams will be periodically assessed, and UT mission will include the delabelling of marginal teams and labeling of new and more dynamic ones.

In order to screen UT\* teams efficiently, UT will implement a dynamic evaluation procedure for academic excellence. Given UT's objective to limit the UT\* label to units with a level of

excellence similar to our benchmarks UCLA and UW-M, UT will use a reliable procedure with strict acceptance conditions.

Excellence in UT and UT\* will be evaluated by high-profile external researchers (similar to those participating in ERC selection committees) who will meet once a year. This “Group of Scientific Evaluation” (GSE) will be coordinated by UT Chancellor and UT director of research. The composition of the GSE will be validated every year by UT Board, which counts a majority of external directors. This process will protect the GSE from local pressure. The GSE immediate task of in 2012 and 2013 will be to define criteria (international ranking of team, per capita publications weighted by the quality of journals, citation indices, international awards, patents, start-up creations, whatever it deems relevant) to assess teams. This evaluation will meet the best international standards prevailing in each discipline. This substantial effort to quantify excellence will build on existing international best practice for evaluation and will be managed by the “Observatory of Performances” that UT will create in 2012. Anticipating on this process, in partnership with Thomson Reuters, the PRES of Toulouse has recently established a list of its best performing researchers in 22 fields that span the entire spectrum of UT scientific community (see below).

With a view to avoid conflicts of interest, the control of internal governance bodies in the definition of the perimeter of excellence will be restricted to an ex post evaluation of decisions by the Academic Senate. The Academic Senate will submit positive recommendations to the Board and to the Executive Committee. The independent Board of UT will be the ultimate decision-maker on the matter, as in all others related to UT.

The field-specific criteria of excellence selected by the GSE will be made public in order to provide the right information and incentives to all research groups within UT. The different IDEX programmes sponsored by UT (chairs, equipment, interdisciplinary challenges, strategic thematic actions..) will strengthen the existing perimeter of excellence and the strategic research teams working with local industrial champions. The evaluation of the projects submitted to these programmes in a bottom-up process will satisfy international standards. UT will also support the emergence of research units which act to credibly demonstrate their willingness to fulfill these criteria. The size of a research team in UT\* is not constrained a priori and UT will have entire leeway in this matter. It is expected, though, that selected research teams will be small: 5, 10 or 20 researchers.

Selected research teams in UT\* will be trusted to allocate their IDEX/LABEX budget as they wish (flexibility naturally goes hand in hand with a rigorous ex post evaluation). Money that can be flexibly allocated is not yet common practice in the French academic world; this approach based on trust and on ex-post (rather than ex- ante) evaluation) will increase the teams reactivity. Consequently, selected teams will commit to avoid crowding out effects (whenever possible, refrain from using IDEX/LABEX funding for actions that can be funded elsewhere).

### ***The initial perimeter***

As of December 2011, UT is not unified. The final balance of power and the strength of the executive (the Chancellor) are not yet achieved. In the transition phase, caution and reversibility are required in order to internally define a perimeter of excellence similar to the UCLA/UWM benchmark. That is why the initial perimeter of excellence is highly demanding and assessed by outside LABEX juries. As early as 2012, though, UT and its GSE will dynamically reevaluate the perimeter according to the rules described above.

Only the full-fledged (non-networked) LABEXes that have been picked by the international jury in rounds 1 and 2 will be selected. Hereunder are the three LABEXes, laureates of the first round:

- The **“Towards a Unified Theory of Biotic Interactions”** (TULIP; 130 researchers) LABEX regroups two scientific communities, ecology and plant biology. This LABEX will be a major institute of “Integrative Biology and Ecology” with high potential outputs in academic, environmental and agronomic sciences. Its innovative research covers the full spectrum of biotic/abiotic interactions, from genes to ecosystems, along a gradient from natural to anthropogenic environments. The objectives of TULIP are to understand and predict individual-species-community responses to a changing world.
- The **“Nano, EXtreme measurements & Theory”** (NEXT) LABEX involves six laboratories (CEMES, LCAR, LPCNO, LCPOQ, LPT, LNCMI-T; 186 researchers), working at the frontier of knowledge in the domains of nanophysics and nanochemistry, condensed and soft matter physics, optics, and atomic/cluster physics. The mastering of many aspects of the nanoworld, involving physicists as well as chemists, from the elaboration of materials to their characterization by a whole variety of techniques, the study of matter in extreme conditions (very high magnetic field, very low temperature, ultra-high spatial and temporal resolution...), and the interplay between experimental and theoretical approaches constitute the trademark of NEXT.
- The **“Institute for Advanced Study”** (IAST) LABEX aims at creating a top-level research community in social sciences in Toulouse and at fostering multi-disciplinary (psychology, sociology, political science, law, human ecology, management, economics, ...) collaborations in this area. IAST will actively promote the transfer of knowledge through conferences gathering scholars and decision-makers, writings, press releases, working papers series, distance learning, and participation in the public debate.

The local nodes of three network LABEXes (SOLSTICE on solar energy, STORE-EX on electro-chemical storage of energy, and CEBA on biodiversity in Amazonia whose funding will be subject to specific rules) together with the laureates (among 14 local candidates) of the second round of the LABEX competition will also be included in this perimeter.

### ***Towards an internal evaluation of excellence***

UT will rapidly develop its own expertise in the quantification of scientific productivity through the creation of the internal Observatory of Performances and the external Group of Scientific Evaluation. This effort will be used to refine the perimeter of excellence. In order to initiate this transformation and to help the GSE in its initial evaluation task, the PRES of Toulouse identified its scientific leaders in 22 different disciplines. With the assistance of Thomson Reuters (TR), the PRES of Toulouse established the list of its researchers in the top 10% best researchers worldwide in their discipline. This has been done by counting the number of citations during period 2001-11 for papers published during the same period (in order to limit the seniority effect). It used the Essential Science Indicators (ESI) journal category and the Web of Science. The following Table provides the number of UT's researchers who belong to that elite category for each of these 22 disciplines, together with the threshold cumulated citation number for the first decile.

This work is not completed at this stage, for two reasons. First, the PRES will refine this analysis in January 2012 by disaggregating the 22 fields into approximately 250 disciplines.

Other methods will have to be used in disciplines in which a bibliometric approach to quality measurement remains difficult, as in various fields of social sciences and humanities for example. Second, as mentioned in this table, Thomson Reuters has not been able to identify the affiliation of a relatively large fraction of researchers. The PRES is currently undertaking an important search effort to identify local researchers in this category of the list.

Fields	# of researchers in the top 10%	# of citations to belong to the top 10%	Proportion of missing addresses	# of identified UT researchers in the top 10%
Agricultural Sciences	29393	50	35%	48
Biology & Biochemistry	75493	145	27%	121
Chemistry	78773	145	18%	221
Clinical Medicine	188181	203	22%	248
Computer Science	25033	28	37%	16
Economics & Business	12408	44	32%	19
Engineering	72056	49	27%	145
Environment/Ecology	36068	79	26%	42
Geosciences	25819	110	18%	195
Immunology	25967	142	32%	47
Materials Science	39245	77	22%	89
Mathematics	12393	39	25%	48
Microbiology	29097	114	31%	62
Molecular Biology & Genetics	49745	206	27%	70
Multidisciplinary	4393	38	53%	4
Neuroscience & Behavior	38930	179	24%	38
Pharmacology & Toxicology	32307	75	35%	35
Physics	54158	194	16%	79
Plant & Animal Science	56687	76	24%	98
Psychiatry/Psychology	26690	88	33%	10
Social Sciences, general	46274	32	41%	12
Space Science	9053	367	13%	60

Table: Number of UT researchers belonging to the best 10% researchers in their field  
(Source: Thomson Reuters)

It is noteworthy that **1,707 identified UT researchers (over a community of 6,520) belong to the world top 10%, i.e., one fourth of the community**. Given the identification problem, this is a lower bound. For example, in Economics & Business, TR has been able to identify 19 UT members in the top 10%, but a search based on the actual list of UT members allowed the PRES to identify 41 UT members belonging to the top 10% in that field.

### ***Strengths and weaknesses of the perimeter of excellence***

Here are the perceived strengths and weaknesses of UT dynamic perimeter of excellence:

- In spite of the existence of clearly identified strengths in various disciplines, interconnections between them are limited, and interdisciplinary projects are scarce.
- The initial perimeter is very restrictive. Out of a total of 6,520 researchers, the initial parameter UT\* may not exceed 10%. However, UT intends to upgrade its strategy of excellence (IDEX programmes, Pact, reform of recruitment and promotion processes)

...) and hereby gradually increase the number of research teams in the league of UT benchmarks (UCLA and UWM).

- The governance of UT\* labeling will fit the international norms over the transitional period 2012-2017 by resorting to the external committee GSE, whose membership will be similar to the ERC selection committees.
- UT and its stakeholders are committed to excellence and its definition in several ways: the Pact, the external GSE, the statutes of UT and its controlled implementation by an independent Board, the selected criteria of academic excellence within each of the 6 “poles of competence“(see section 5.2.1), and the initial effort by the PRES to characterize the list of its top10% researchers.

## B. Four-year target and expected risks

### ***Scientific ambition (Criterion 2 of IDEX call):***

UT scientific ambition is to secure a position in the top 100, and to nurture a perimeter of excellence UT\* whose components will compete with their corresponding components in our top-20 benchmarks (UCLA and UW-M). The former objective is long term (20-year timeline) while the latter is very short term (implying of course a limited initial perimeter UT\*).

Acting with good intention is not enough to conduct an adequate policy. Given the expected risk, the credibility of UT ambitious reforms is supported by two crucial key elements during the transitional period 2012-2017: The Pact, and its powerful independent ruler. By fall 2012, all UT members will sign a Pact offering a legal basis according to which they commit themselves to implement these reforms. The elements of the Pact are detailed in this document. It will be supervised by UT Board which will be able to impose gradual penalties on under-achieving units, ranging from the non-eligibility to IDEX funding to the forced exit from UT. After the legal creation of UT as a Grand Etablissement, and in addition to these sustainable implementation schemes, UT will furthermore be entitled with a golden share in each board. This golden share will give UT the power to block decisions that exert externalities on the rest of the UT community and could reduce overall attractiveness: obedience to the Pact (recruitment, multi-disciplinary teaching programmes ...), member’s change of statutes or election of its president for example.

These reforms are expected to generate a quantum leap forward of a rich scientific ecosystem in Toulouse. Some research units are already competing with their current means for international intellectual leadership. They will be strongly supported by IDEX funds, by UT, by its colleges and industrial partners. Three LABEXes (NEXT, TULIP, IAST) are immediately integrated into UT\*, but others are expected to follow suit. Decision will be made by the Group of Scientific Evaluation (GSE), a group of external reviewers similar in quality to ERC juries, by using the best world bibliometric criterion in each discipline. For example, the Institut de Mathématiques de Toulouse has recently been ranked 42nd best department of mathematics by Times Higher Education. Thanks to its 11 engineering schools and their strong links with international industrial champions (aerospace and aeronautics, agro, health,...), 3 RTRA/S, 4 clusters of competitiveness, 1 IRT, ..., UT has the potential to emerge as a global player on the academic scene, conditional to the implementation of these reforms.

As early as 2013, five IDEX programmes will channel up to 30 million € per year of IDEX funds



in favour of excellence, with an important leverage effect from UT and partners. Each euro from the IDEX fund will generate a minimum of 2 euros and up to 3 euros of additional resources for the laureate team, after an evaluation by the GSE. For example, the IDEX UT\* chair programme will create around 90 “reverse brain drain” chairs at steady state: UT and the relevant college will offer the academic position to the chair-holder, and the IDEX fund will cover the extra costs (merit-based delta salary, visitors, research funds,...). The programmes have been shaped in such a way that the IDEX fund will not crowd out other sources of financing (ERC, IUF, ANR, CNRS, INRA,...), but will rather be seed money to attract the external funds. For example, UT is discussing with the national research institutes (CNRS, INRA,...) the opportunity to support some UT\* chairs by offering job positions. Moreover, UT\* chairs have the potential to attract high-profile researchers who will receive ERC junior or advanced grants.

These programs are conducted with a bottom-up approach: any unit, either inside or outside UT\*, will be allowed to compete for these funds. It is expected that a large number of projects financed by the IDEX fund will emanate from the UT\* units which have a leading edge in the domain of excellence. But the UT\* label will not be a vested right, and UT will also support the emergence of excellent projects from non-UT\* units. The GSE will evaluate them all, and will act as the warden overseeing both UT\* entry and exit.

Two specific IDEX programs will provide the tools UT needs to reinforce the strong dynamics that exists in some specific domains at the interdisciplinary frontiers (Cross-cutting and/or emerging Scientific Challenges, CCESC), or at the frontier between research and innovation (Strategic Thematic Actions, STA) in partnership with local industrial champions and clusters. STA funding will be earmarked to the domains of aeronautics, bio-health and agronomy, under the quality check for excellence by the GSE.

***Teaching: Ambition and innovation (Criterion 4):***

UT ambition to belong to the international top 100 best universities spans research, innovation and higher education. The reforms presented in this document are aimed at upgrading UT global training offer to boost the international attractiveness of its best diplomas, together with its students’ employability. The existence of a single trademark “University of Toulouse” (and “Toulouse Tech” for its college of engineering) is a key component of these reforms, which can be illustrated with the following examples:

- **Selectiveness and excellence in bachelor degrees:** UT will reshuffle its portfolio of bachelor degrees in order to gradually differentiate students according to their capabilities and aspirations. The best students will be offered an access to more demanding programs of excellence (Bachelor programs\*). Such Bachelor\* programmes will be created in law, mathematics, physics, chemistry, computer science, economics and management for example. Eight such B\* programmes will be created in the Science, Technology and Health (STH) college within the next four years. A flow of around 1,000 students will obtain these upgraded bachelor degrees (target 2016). Those who do not enter these programmes will continue with classical bachelors. This differentiated system will also have the advantage reducing the current failure rate in bachelor degrees (one of the weak points of the current higher education system in France).
- **Creation of Toulouse Tech:** Given its great strength in the field of engineering, UT has decided to improve coordination by creating a specific College, *Toulouse Tech*<sup>®</sup>, bringing together all the engineering Grandes Ecoles of the site. Besides the obvious

benefits in research, the site will gain greater international repute (teachers, researchers, students) thanks to its training offer (cross-curriculum, teaching practices), its industrial partnerships (financing of chairs, foundations ...) and its relationships with agencies and national research institutions. Each Grande Ecole will keep its brand and communicate abroad with the Toulouse Tech<sup>®</sup> label (like the Grandes Ecoles of Paris Tech<sup>®</sup>). In 2012, Toulouse Tech<sup>®</sup> will launch several structural actions, e.g the establishment of a single portal for the promotion of engineering training degrees, the coordination of the continuing education offer and the merging of the related services for MESR Grandes Ecoles, the creation of a unique Observatory of skills and jobs, or the possibility to exchange study semesters between Grandes Ecoles (for students) and faculty teaching credits (for teachers). The next step in 2016 will be to set up the Toulouse Tech<sup>®</sup> College as a legal “Grand Etablissement” bringing together all the Grandes Ecoles of the site. The Grandes Ecoles with line ministries other than the Ministry of Higher Education and Research could have special status. This largely structuring project will be accompanied by the disappearance of INP, the university which brings already together 7 of the Grandes Ecoles of the site. Together with the creation of Toulouse Tech<sup>®</sup>, UT will offer new engineering courses to meet the growing needs of industry in the Midi-Pyrenees region. In order to reach 10% of the national flow (3,000 engineering degrees per year), new joint Master degrees between Toulouse Tech<sup>®</sup> and the Sciences, Technology and Health (STH) College will be created; apprenticeship training schemes and a new Bachelor degree in Engineering (Bachelor’s\*) relying on a solid partnership between the local industry, Toulouse Tech and STH will also be added to the offer.

- **Fostering multidisciplinary training programmes:** Innovation, which is at the core of a knowledge-based economy, requires transversality and interdisciplinarity. The objective of UT is to capitalize on its unique span of academic knowledge and resources to offer multidisciplinary training programmes that will be deployed within the next 4 years. Multidisciplinary training programs are managed at UT level with a dedicated academic and administrative structure. The Academic Senate validates new programmes and checks that they are implemented. In accordance with the Pact, all UT members agree upon common principles to ensure projects feasibility: a common weekly slot (half a day) dedicated to multidisciplinary training, mutualised classes, teaching load dedicated to multidisciplinary study programs. In addition to this major/minor system, UT will reinforce its offer of dual-degree programs. In order to make full and better use of teaching competences, UT will also set up a clearing house, which will enable members to exchange faculty teaching credits.
- **Strengthening doctoral programmes:** UT will take advantage of IDEX to enhance the attractiveness and value of its doctoral programmes. It thus aims at significantly increasing the number and level of its doctoral students to take up the challenge of the knowledge-based economy in disciplines with a short supply of doctors. Engineering is an example of such discipline confronted with the high growth rate of local High-Tech industry. The expected increase of PhD degrees is + 10% a year, + 50% in 4 years and +150 % in 10 years. This goal will be reached by improving the quality of UT graduate students as well as UT national and international attractiveness. A School of Doctors will also be created, with the missions to further develop coordination among the various graduate programs (single PhD diploma, under the control of UT), to search for additional external funding resources, to

promote and to support graduate students' internships in partnership with leading universities abroad, and develop doctoral skills for the public and private sector.

**Quality and Performance Certification of UT higher education training programmes:** UT will encourage a management system of the training offer based on a quality and performance approach in order to promote the international notoriety of its teaching portfolio. The quality approach will comply with the international standard iso-9001 2008: each training program or institution will have to demonstrate the ability to identify its beneficiaries (students, employers), to define measurable objectives, to develop a satisfaction monitoring system, and to adapt its training programs consequently. In order to assess performance, UT and its colleges will use an international accreditation approach and related labels whenever possible. In order to make up for the lack of external accreditation norms in some fields, UT will deliver a 5-year *Quality and Performance Certification* based on the international quality standards and on ambitious thresholds for performance criteria.

***Economic partnerships, research valorisation and technology transfer (Criterion 5):***

UT will be a valuable driving force to boost innovation and productivity in its region. Conversely, UT will strongly benefit from the presence of industrial champions and innovative High-Tech SMEs in the Midi-Pyrénées region which is already number one in France for Research and Development (public and private) in terms of its GDP. The region's R&D activity has a direct impact on industrial employment; in 2009, the region boasted a trade surplus of €13 B, while the national deficit for the same period was €43 B. Aeronautics, Space and Embedded systems (electronics, IT), Agro, and Cancer Bio-Health build up the economic fabric of the region. UT target is to double by 2018 its indices of economic partnership by 2018 (number of spinoffs, patents, joint university/industry labs, jobs, volume of contracts with the industry,...) through the emergence of a genuine innovation ecosystem in Toulouse.

Three recent successes in the "Investments for the Future" calls testify to this ambition: the Toulouse White Biotech (TWB) Institute, the "Aeronautics, Space and Embedded Systems" Institute of Technical Research (AESE IRT), and the setting-up of a subsidiary company dedicated to technology transfer (SATT). These institutions will be operational in early 2012. TWB is a centre for excellence in industrial bio-technologies. This project initiated by Pierre Monsan from INSA/UT involves technology SMEs alongside academic partners.

The **AESE IRT** brings together industrial groups such as Airbus, Thales, EADS, Alstom, and SMEs that are committed to working with academic laboratories. In particular, joint initiatives will be considered to promote the site by staging technology conferences, hosting invited international researchers, and embarking on international and European collaborative research projects. One of the IRT's objectives is to participate in further developing educational material and providing new training in line with technological advances and the emergence of new skills, within UT. Furthermore, the IRT will facilitate access to its equipment and technological platforms for the purpose of academic training. The IRT will also host and supervise PhD students in close collaboration with UT.

The IDEX program "**Strategic Thematic Actions**" will provide long-term coordination and support to research by positioning itself upstream of technological developments with the local industrial leaders and clusters. The research work will be closely linked to technology

challenges and hurdles expressed by the partners (IRT, industry, clusters,...) in order “to mature” the resulting technologies. This organization will guarantee a coherent approach - driven by scientific skills and market needs - in terms of innovation chain.

**SATT** will be in charge of valuing UT research output in partnership with UT colleges, national research institutions, the industry, and the local public authorities. SMEs will be the main industrial target of the SATT in terms of access to new technologies and new solutions that SATT will help co-develop. The aim is to make SATT Toulouse an actor in developing and transferring technology by allowing it to directly invest in projects. It will provide funding and skills to laboratories in order to develop inventions, protect industrial developments, manage patent applications, find partners, participate in transfers and ensure legal protection. It will suggest partners, particularly SMEs in order to spread out risk-taking and subsequently share the expected benefits.

UT has designed a governance structure able to generate synergies and decisions with a view to promote innovation. This takes two forms. First, UT will have a partnership department whose director will be a member of the Executive Committee (EXCO) of UT in order to closely follow the activity of these partnerships tools (IRT, SATT, TWB, etc). Second, UT's Committee of Strategic Foresight (CSF) will include all socio-economic partners and the local authorities with the aim to improve dialogues among these main players of the innovation ecosystem. The CSF makes recommendations directly to the executive committee and to the Board of UT. These reforms are immediately operational.

#### ***International and European policy (Criterion 6):***

The unified UT will have a much stronger visibility and appeal than the sum of its components. This will particularly be the case for UT\*, whose objective is to assemble a virtual campus of research and teaching whose appeal and prestige is similar to UT benchmarks UCLA and UW-M. UT strategic actions within a 4-year horizon are as follows:

- UT will reinforce the most prestigious partnerships of its components. In the field of engineering and economics, UT has (students and researchers) exchange programs with MIT, Stanford, Northwestern, Berkeley, Caltech, Oxford, TU Munich or Tokyo for example. UT will amplify its partnerships with universities belonging to the international top 150 (joint chairs, research network, double-diplomas, international labs,...), in line with its own academic ambition.
- UT will also reinforce its existing teaching programmes in (mostly European) networks (30), its Erasmus Mundus programmes (7), and its programmes in English (20). New international programs will be on offer. UT objective is to raise the number of high-profile foreign students in Master programs by 10%, particularly by awarding Master degrees scholarships.
- UT will identify geographic zones with a strong potential of scientific excellence in emerging countries, with the objective to create a UT campus of research and education in the best location. Asia and Latin America are prime targets, but the final decision on the location will be made in 2016. Within 2 years, UT will implement two local antennas there in order to evaluate the costs and benefits of such a project. The significant economies of scale offered by a united UT will help and coordinate the actions of the different colleges around these specific geographic targets. This campus will offer different teaching programs in relation to the perimeter of excellence UT\*.

- UT will implement a service in charge of promoting and coordinating the actions of the colleges and departments related to European affairs. The acquired know-how/savoir faire centralized in this service will support project leaders (PCRD, ERC,...) in their work. This service will also circulate and collect the information about calls for tenders and of liaising with European institutions.

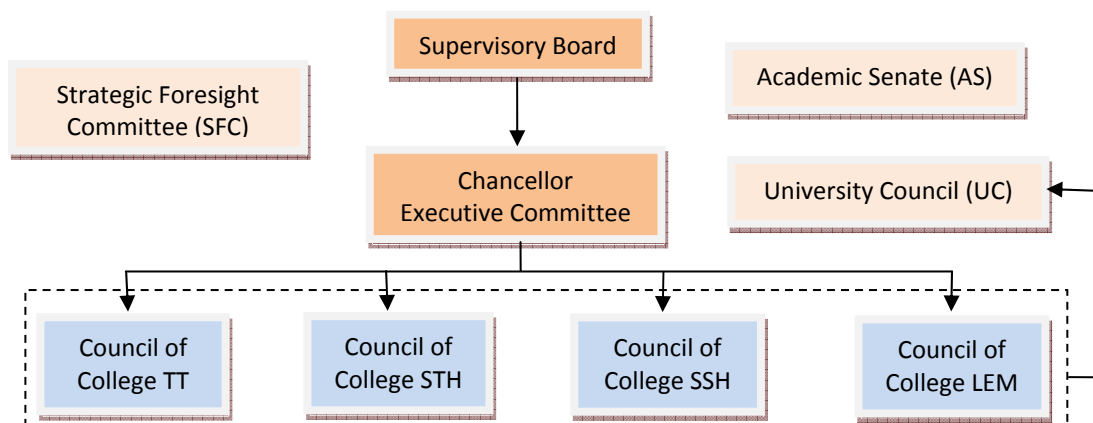
UT director of International relations will be a member of the executive committee. One of the possible risks attached to UT strategy is to develop international partnerships before emerging in the top 100. That is why UT will limit its ambitions in the short run rather than finalize too many irreversible partnerships.

**Governance: ambition, identity, transformation and structure (Criterion 8):**

UT overall ambition, and UT\* even more demanding perimeter of excellence, would not be credible without an impeccable governance structure. The IDEX project simplifies the governance of the site by terminating the PRES (2012), all boards of directors except UT's Board (2018), and by regrouping research units and educational programs into global fields (2014-2015).

By 2016, UT will be the single university body controlling the budget of a set of 4 disciplinary coherent colleges: "Toulouse Tech" which will gather the current schools of engineering, "Science, Technology and Health (STH)", "Social Sciences and Humanities", and "Law, Economics and Management". By then, the link between the 4 colleges and UT will be governed by "Article 43" (article L. 719-10 of the Code de l'Education). They will be also linked by a binding Pact committing them to abide by a set of transparent principles in recruitment, teaching, promotion, devolution to UT, scientific evaluation, promotion of excellence, with the aim of building up a common culture and a sense of belonging to a prestigious and efficient global university sharing the same destiny.

As early as summer 2012, all governance bodies of UT are created or prefigured by anticipation of the legal founding of the "Grand Établissement" UT in early 2013. During the transitional period 2012-16, UT will not only manage the IDEX funds and the delegated missions (multidisciplinary teaching programmes, merit-based bonuses PES, international relations, partnerships, computer services,...), it will also serve as the auditor and custodian to the Pact, making provisions for imposing sanctions on non observant members.



This requires a strong central authority. The Supervisory Board will play this role. UT's Board has 12 directors, 7 of them being external, independent and having no conflict of interest with respect to the community. Moreover, the only "captain" in command of UT will be the Chancellor entrusted with wide responsibilities by delegation from UT Board for the day-to-day management of the university. The Chancellor will be assisted by an efficient EXCO.

The (already active) Academic Senate advises the Board and the executive committee for all relevant academic affairs. The restricted AS with 12 members illustrates the excellence of the site. In the first semester of 2012, UT will create the Committee for Strategic Foresight in charge of advising the Board and the executive committee on all matters related to innovation policy, applied research, and professional training programs.

One of the risks attached to this process is the non acceptance of the gradual loss of sovereignty by the universities/Grandes Ecoles/colleges as short-term costs will materialize before the emergence of longer term benefits (international visibility and attractiveness, externalities from adhering to the Pact,...). The positive votes of the Boards of UT partners in December 2011 are dependable but insufficient signals of their long-term commitment to progress toward full merging in January 2018. The Pact will offer UT Board a legal basis to intervene in case of clear infringement to some of its principles. UT will not negotiate any revision of the Pact, and will prefer to opt for the exclusion of one of its components (at the level of research units or departments) in case of repeated infringements. And, UT will own a golden share in all college boards. In order to further assess some of the likely risks, we have analyzed our strengths and weaknesses in training, research, international relations and partnerships:

	<b>Strengths</b>	<b>Weaknesses</b>
<b>Research</b>	Acknowledged strength in a wide curricula spectrum, particularly in engineering, economics and sciences of the universe	Little joint research addressing socio- economic challenges; Interdisciplinary research only in science and technology
<b>Training</b>	Strong reference Grandes Ecoles at the national level; International certification in economics, management, engineering and aeronautics; No university entry requirements	Grandes Ecoles Curricula lack legibility; International certification does not cover all disciplines; No university entry requirements
<b>Valorisation</b>	Strong economic leading activity (aeronautics and space); Hi-tech SMI/SMEs fabric; Wide network of partnerships	Heavily dependent on one single sector; Insufficient links between SMEs and upstream research; Insufficiently developed intellectual property
<b>International Relations</b>	High-ranking research partnerships with top 100 ARWU universities; Wide international training spectrum (dual diplomas, English taught courses, off-shore training...); Membership to European leading projects and networks	Lack of global strategy – cooperations resulting from opportunities and personal relationships; Highly fragmented actions and means, hence lack of visibility

**Perimeter of excellence: strengths and weaknesses**

From this analysis, we are devising a project management based on a dynamic risk assessment and building a change-supporting strategy.

***Resource allocation system (Criterion 11):***

In 2015, UT will be the unique local negotiator for the “Plan Quinquennal 2016-20” with the Ministry of Higher Education and Research. In January 2016, UT will be the only recipient of the global public funding of UT colleges. This approach will reinforce the collective policies to be implemented by the colleges under the Pact starting in 2012: concentration of financial and human resources on the best performing units, improvement of recruitment and promotion standards, freezing of recruitment for research units with poor evaluation records from AERES, ... In 2012, UT will create a new service unit in charge of internal audits, with full authority on the entire community. Upon request, this unit may be assisted by external experts, some of them from international audit firms. It will be under the direct control of UT Board which will periodically assign a set of specific items to audit: management of HR and of public procurement, control of the University image, ethical code and budget implementation, etc.

Concerning the allocation of IDEX resources, excellence will be the only relevant criterion in the process of assessing and selecting projects. In 2012, UT puts in place a Group of Scientific Evaluation (GSE) to perform this task. The GSE is composed of egregious scientists from outside Toulouse. Its composition will be similar to ERC juries. To assist the GSE in its evaluation tasks, UT will create the Observatory of Performances, which will be in charge of mapping the excellence of the site. A bottom-up competition for the best projects within the 5 different IDEX Programmes will be organized every year by UT director of research under the authority of the Chancellor. At the end of this process, the GSE will submit to the chancellor one ranked list of the best projects. UT Board will make the final decisions upon recommendations of the Chancellor. The Academic Senate will ex post evaluate the outcome of this process. Four fifths of the IDEX funds are earmarked for the 5 IDEX programmes. The IDEX funds are under the direct control of the Chancellor and of the director of research, by delegation of the Board.

C. Operational measures and corresponding timeline

This section describes the timing of the actions linked to the creation of a unified University of Toulouse by the year 2018. At each stage in the process, the representative stakeholders to UT and its members will be involved in the organization of the reforms and their evaluation. UT’s Board will orchestrate them in coordination with its three advisory committees (AS, UC, SFC). In order to provide a global vision, a single time line is proposed, which combines actions in all dimensions of the reform. This timing is summarized in the following Figure.

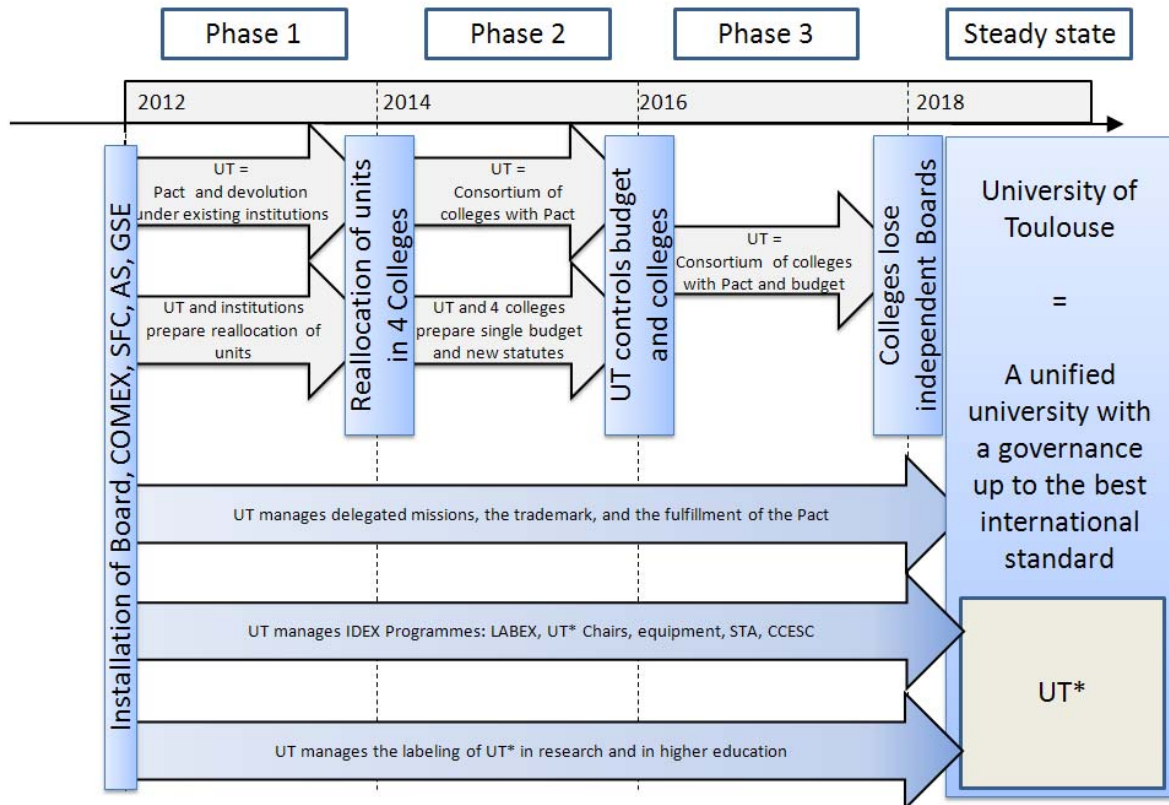


Chart: Process of transition 2012-18

***First semester of 2012 (under the supervision of PRES and UT's Academic Senate)***

- The bureau of PRES, including two representatives of the National Research Institutions, is enlarged by integration of the future members (the project leader and the thematic directors) of the EXCO as soon as their recruitment has been made.
- Management of the progressive (finished end of 2013) transfer of delegated missions from members to UT.
- Installation of inter-institution committees in charge of the implementation of restructuration.
- Implementation of a careful change and transitional management.
- Final approval of the Pact by the Boards of UT's members. The Pact is implemented immediately.
- Preparation of the statutes of the Grand Etablissement UT, in partnership with the State.
- International search for the project leader in partnership with an international human resources institution. This project leader is aimed at being proposed further as the Chancellor for UT and will be in charge of choosing the four delegated directors of UT (research, education, international relations, economic partnerships).
- Constitution of the Strategic Foresight Committee (SFC).



- Constitution of the Founding Board:
  - Selection of the 7 external Board members (as described in details later in this document): Nomination by the joint committee of the Restricted AS and the bureau of PRES. Selection by the Committee of Learned Experts.
  - In this transitional period (and given that several local institutions will experience an electoral campaign during the period), the General Assembly of the PRES selects the 3 representatives (1 teacher/researcher, 1 administrative staff, 1 student) of the site to sit on the Founding Board.
- July 2012: Installation of the Founding Board of UT. As this Founding Board has no legal existence until the legal creation of the Grand Etablissement (probably in early 2013), the PRES validates the decisions of UT's Founding Board concerning the composition of the SFC, the recruitment of the Chancellor (formally "project leader" before the legal creation of UT) and the thematic directors.
- Nomination of potential members for the GSE by the Founding Board.
- During this period, the existing institutions transform their external communication by naming themselves "College of XX of the University of Toulouse". Researchers are required to sign their publications under the affiliation "UT", as stated in the Pact.
- The University Council (formally the "General Assembly" before the legal creation of UT) is created. It is composed by the board members of UT components. It meets once a year.

#### ***Fall semester 2012***

- First meeting of the GSE to discuss rules to evaluate research units and training programmes to be labelled UT\*.
- First campaign of IDEX Programmes (to be repeated every year): September: publication of the Call for Tenders for the IDEX Programmes. November: Deadline for submitting projects. February: Ranking of all projects by the GSE, followed by the Chancellor making offers (reverse brain drain chairs). April: Validation of decisions by Board.
- UT starts to organize the progressive transfer of research and teaching units in disciplinary homogeneous colleges, with the corresponding transfer of financial resources.

#### ***Early 2013 legal creation of the Grand Etablissement***

- Formal creation of UT by a publication in the Journal Officiel. The founding Board becomes the Board of UT. It formally validates earlier decisions made by the PRES under its moral authority.
- First meetings of the EXCO. Installation of the 4 UT's directorships. Initiation of recruitment and transfer (from colleges) of staff.
- Establishment of the Observatory of Performances and other UT service units.
- Creation of Toulouse Tech, which will be a Grand Etablissement within UT. Preparation of its statutes negotiated by the 12 schools of engineering under the leadership of UT.

**SUMMARY OF TRANSITION BODIES**

← EARLY 2013 →	
STRATEGIC FORESIGHT COUNCIL	UNCHANGED
GROUP OF SCIENTIFIC EXPERTS	UNCHANGED
ACADEMIC SENATE	UNCHANGED
FOUNDING BOARD	(SUPERVISORY) BOARD
PROJECT LEADER	CHANCELLOR
GENERAL ASSEMBLY	UNIVERSITY COUNCIL
ENLARGED BUREAU DU PRES	EXCO

***From January 2014 to December 2015***

- The existing institutions are transformed into thematic colleges of UT. They replace their statutes of a university by those of a college (article 43) of UT. They take this opportunity to insert the Pact in their new statutes, and to offer a minority voting right (golden share) in favour of UT.
- UT negotiates the Plan Quadriennal 2016-20 in the name of its members.

***From January 2016 to December 2017***

- UT manages and allocates the global public budget of the university and its colleges.
- UT and its members prepare the final step of the merger: after a consultation of the stakeholders and in cooperation with the Ministry, the 4 colleges lose their legal identity to become full-fledged colleges of UT. Their dean is selected by the Board of UT after a nomination by their (advisory) Council of College (which replaces their Board).

***January 2018***

The University of Toulouse is a unified university with a single destiny, a single community, and a single budget. It has a governance structure equivalent to the most reputed academic institutions around the world, with an independent Board and a single captain, UT's Chancellor.

### 3. EXECUTIVE SUMMARY

Le monde académique toulousain est riche de sa grande diversité : 94 000 étudiants, 7 100 chercheurs et enseignant-chercheurs localisés dans de nombreux laboratoires dont certains sont de renommée mondiale, 4 universités, 12 écoles d'ingénieur, 6 instituts et écoles, 3 RTRA/S, une SATT, 4 pôles de compétitivité, un IRT, un Cancéropole, 8 Instituts Carnot, 6 organismes de Recherche (4 EPST, 2 EPIC) ainsi qu'un réseau extrêmement dense d'entreprises développant des recherches appliquées en partenariat avec le monde académique, notamment dans les domaines de l'aéronautique, de l'espace ou de la bio-ingénierie par exemple. Midi-Pyrénées est ainsi la 1<sup>ère</sup> région mondiale pour l'aéronautique et la 1<sup>ère</sup> région européenne pour l'industrie spatiale. Le projet IDEX « Université de Toulouse » (UT), soutenu massivement par la communauté scientifique, les collectivités territoriales et le monde socio-économique, propose une restructuration complète de cet ensemble en vue de créer à Toulouse une université unique de rang mondial qui soit cœur de l'écosystème de l'innovation. Elle sera fondée sur un pacte commun et une gouvernance conforme aux meilleurs standards internationaux. Elle offrira des formations diversifiées et ouvertes sur l'interdisciplinarité de telle sorte que chacun puisse y trouver une formation qui corresponde à son potentiel, avec une attention toute particulière pour les formations d'excellence.

#### ***Un Pacte qui fédère les établissements du site***

Tous les établissements actuels qui composent le pôle de recherche et d'enseignement supérieur de Toulouse et de la région Midi-Pyrénées adhéreront à un pacte commun qui scellera leur union. Ce Pacte décrit un ensemble de principes et de règles de bonne pratique qui s'imposeront à l'ensemble de l'Université dès 2012, début de la période de transition, de manière à anticiper la politique de l'université fusionnée. Ce pacte sera intégré comme préambule aux statuts de chacun des membres d'UT dans les mêmes termes, de manière à en rendre son application irréversible et uniforme ; son non-respect entraînant une réaction graduée de la part d'UT qui peut aller de la recommandation, au gel des moyens, et jusqu'à l'exclusion du membre. Ce pacte concernera tous les aspects stratégiques de l'Université : la politique des ressources humaines (endorecrutement, tenure-track...), la recherche, la formation, les relations internationales et les relations partenariales.

#### ***UT, acteur majeur de l'écosystème de l'innovation***

La région Midi-Pyrénées est la première région française pour l'intensité globale de Recherche et Développement (publique et privée) par rapport à son PIB, soit 4,2% dont 2,5% provenant de la R&D des entreprises. Ce taux d'effort se situe bien au-delà des préconisations européennes de la stratégie de Lisbonne qui établissent le seuil à 3%. Cette activité de R&D a une incidence directe sur l'emploi industriel, qui a ainsi été préservé dans notre région pendant les trois dernières années alors qu'il reculait de 10% en France. Ajoutons enfin que la région est la première de France en matière de croissance du PIB sur la dernière décennie. Trois grands secteurs structurent cette région : l'aéronautique, l'espace, et les systèmes embarqués (électronique, informatique), l'agronomie, et le secteur cancer bio-santé.

Grâce aux fonds de l'IDEX, UT dynamisera ce tissu industriel par des projets de recherche amont en lien avec des enjeux à long terme industriels et sociétaux : des Actions Thématiques Stratégiques seront lancées dans trois secteurs – aéronautique, espace et

systèmes embarqués ; cancer, biologie et santé ; agronomie – en s'appuyant sur le RTRA Sciences et Technologies pour l'Aéronautique et l'Espace, le RTRS Innovation Thérapeutique en Cancérologie, et en lien avec les 3 pôles de compétitivité correspondants, l'IRT AESE, la plateforme TWB et le projet SYNTHACS. La gouvernance de ce programme sera ouverte aux partenaires industriels les soutenant et permettra de partager la construction d'une feuille de route stratégique concernant toute la chaîne de l'innovation. Avec sa filiale SATT en lien avec l'incubateur Midi-Pyrénées, l'UT fédérera et amplifiera l'ensemble du processus de la valorisation de la recherche, définira et suivra la réalisation d'objectifs ambitieux dans le domaine de l'innovation et accompagnera la création d'entreprises issues des recherches menées dans ses laboratoires.

UT mettra en place un suivi quantitatif de ces objectifs dans le domaine de l'innovation.

### ***Un périmètre d'excellence aux meilleurs standards internationaux***

L'Université de Toulouse animera en son sein un périmètre d'excellence noté UT\*, qui entrainera l'ensemble du site dans son sillage. Le périmètre initial est constitué des LABEX labellisés par le CGI. Pour mettre en cohérence cette structure avec l'excellence avérée et émergente du site, une procédure transparente et efficace de renforcement de ce périmètre est organisée par l'UT. Elle est fondée sur un Groupe d'Evaluation Scientifique (GES) dont les membres sont des chercheurs extérieurs dont la qualité scientifique est au moins équivalente à celle des jurys ERC. Dans une vision dynamique de l'excellence, l'UT définira par retouches successives son périmètre d'excellence, de manière à ce que les équipes qui s'y trouvent puissent se prévaloir d'une productivité scientifique du niveau de nos universités internationales de référence : L'Université de Californie à Los Angeles et l'Université du Wisconsin à Madison.

Dans le domaine de la formation, le périmètre UT\* sera composé des formations bénéficiant d'une certification internationale reconnue et de celles qui peuvent se prévaloir de l'appartenance à un réseau international de formation de niveau mondial. UT arrêtera dès 2012, à l'aide du GES, la liste des labels internationaux référents ainsi que la liste des réseaux d'universités ou d'écoles de niveau mondial. UT mettra en place des dispositifs d'aides logistiques pour que les formations qui souhaitent obtenir les certifications internationales ou appartenir à des réseaux référents puissent le faire en maximisant leurs chances de réussir. Elle s'attachera à ce que toutes les composantes du site puissent bénéficier de l'expertise accumulée par les formations appartenant au périmètre d'excellence. Enfin, les formations qui obtiendront le Label IDEFI appartiendront au périmètre UT\*.

La montée en puissance de l'excellence scientifique de l'UT nécessite une focalisation de ses moyens propres et de ceux de l'IDEX sur le renforcement de son attractivité. Pour ce faire, cinq programmes concernant la recherche seront financés par le fonds IDEX : consolidation des LABEX, Chaires (permanentes et temporaires), Equipements, Actions Thématiques Stratégiques, déjà évoqués au paragraphe précédent, et des Défis Scientifiques Transverses et/ou Emergents ouverts sur les enjeux sociétaux. La consolidation et la pérennisation du financement des LABEX labellisés est un effort financier sanctuarisé par UT. Les autres programmes du fonds IDEX sont ouverts à l'ensemble des équipes du site. L'ensemble des projets soumis pour financement à l'IDEX sont évalués par le GES selon le seul critère de l'excellence scientifique suivant des standards proches de ceux de la NSF ou de l'ERC par exemple. Ces programmes permettent une vraie politique de renforcement de l'attractivité et de « reverse brain drain ». Le programme de chaires UT\* permettra à terme la création d'une centaine de chaires d'une durée moyenne de 5 ans renouvelable, pour des candidats

dont la qualité leur permettent de prétendre à un recrutement dans le top20 mondial dans leur discipline. Pour améliorer la qualité du processus de recrutement, les chaires juniors sont recrutées sur des contrats de type « tenure track » mis en place par les collèges, avec une évaluation conjointement par le GES (Groupe d'Experts Scientifiques) et par le collège d'accueil durant la sixième année.

### ***Une offre globale de formation refondée***

La création de l'université unifiée UT s'attachera à renforcer l'attractivité des formations de ses collèges, en particulier dans le périmètre UT\*. Elle s'accompagne de la mise en place de réformes ambitieuses dans le domaine de la formation afin de relever les défis liés à l'économie de la connaissance. Au niveau doctoral, l'ambition de l'UT est d'accroître de manière significative le nombre et la qualité des doctorats délivrés chaque année à Toulouse et de se doter des moyens pour atteindre cet objectif. Pour atteindre cet objectif ambitieux, l'UT élaborera des parcours « recherche » dès le M1, incluant par exemple un stage long de recherche en laboratoire pour les élève-ingénieurs.

Le Collège Doctoral de Site sera transformé en une École des Docteurs d'UT pourvue d'un vrai statut et des moyens nécessaires à une meilleure organisation de parcours doctoraux attractifs, à une plus grande coordination de la formation doctorale et à une valorisation du doctorat. Un label de doctorat « Ingénierie pour l'Entreprise » sera mis en place pour renforcer l'employabilité des docteurs dans ce domaine. Au niveau Licence et Master, un renforcement de la diversité des filières sera organisée de manière à offrir à chaque étudiant la voie qui lui convient le mieux. Des filières progressivement plus exigeantes labellisées UT\* accueilleront les meilleurs d'entre eux, tout en offrant aux autres des formations adaptées. Des moyens pédagogiques spécifiques (classes supplémentaires, projets de recherche, stages dans des laboratoires ou des entreprises, programmes internationaux enseignés en anglais ...) permettront de développer l'excellence de ces filières.

D'ici 2016, l'objectif est d'atteindre un flux de 1000 diplômés des programmes de L\* et M\*. Ce faisant, l'UT réduira les échecs et les abandons, et encouragera en même temps l'excellence. En licence, la pluridisciplinarité sera encouragée, et chaque collège s'engage à libérer une demi-journée par semaine qui sera exclusivement réservée aux enseignements transverses. De plus, le nombre et la diversité des programmes L-M bi-disciplinaires et majeur/mineur seront augmentés. Des modules d'enseignements plus concentrés seront également proposés en juin/juillet (« *summer courses* »). Il sera d'autre part possible d'effectuer un semestre de substitution (complément de formation sur un semestre, choisi par l'étudiant sur un autre établissement du site, pour des cursus partagés entre établissements). Pour les échanges les plus significatifs entre formations master et ingénieur, la substitution se traduira par la délivrance d'un diplôme co-habilité master-école d'ingénieur. L'objectif de l'UT est de mettre à profit sa très grande richesse de compétences académiques pour offrir aux étudiants des programmes originaux de formation pluridisciplinaire. Le Collège Toulouse Tech®, rassemblera les écoles d'ingénieurs du site. Outre des avantages évidents dans le domaine de la recherche, le site y gagnera beaucoup dans le domaine de l'attractivité internationale (enseignants, chercheurs, étudiants), de la formation (cursus croisés, pratiques pédagogiques), des partenariats industriels (financement de chaires, fondations...) et des relations avec les organismes et grands établissements.

Parallèlement à la mise en place de Toulouse Tech<sup>®</sup>, l'UT a l'ambition de créer de nouvelles formations en ingénierie pour répondre aux besoins de l'industrie de Midi-Pyrénées qui manque aujourd'hui d'ingénieurs et de docteurs en ingénierie pour poursuivre sa croissance.

Grâce à un partenariat entre les Collèges Toulouse Tech et STS, l'objectif de l'UT est d'atteindre 10 % du flux national (3000 ingénieurs diplômés par an) et conforter ainsi la puissance de notre région dans ce domaine. A la demande des industriels de Midi-Pyrénées, une Bachelor\* en ingénierie sera également créée. De nombreuses actions seront mutualisées : assurance qualité, label d'excellence en ingénierie (EUR-ACE<sup>®</sup>), actions internationales, formation continue, plateformes de Travaux Pratiques, politiques ambitieuses de formation à l'innovation, et à l'entrepreneuriat...

### ***Une gouvernance optimisée***

Pour atteindre ces objectifs, la structure et la gouvernance d'UT seront aux meilleures normes internationales. Au 1er janvier 2018, l'Université de Toulouse sera dirigée par un Directeur Général Exécutif (DGE) disposant de larges pouvoirs exécutifs en délégation d'un Conseil de Surveillance (CS) réduit et indépendant. Le DGE présidera un Directoire en charge de la mise en œuvre de la politique de l'UT et de l'exécution de ses missions. L'UT sera composée d'un petit nombre de collèges dont les doyens seront nommés par l'UT, et dont les moyens leur seront alloués par l'UT.

Dès 2014, chaque collège sera disciplinairement homogène, ce qui implique un important regroupement d'équipes de recherche et d'enseignement entre les établissements existants, tout en autorisant les bi-affiliations de certains chercheurs en vue de favoriser l'interdisciplinarité. L'animation scientifique et la gestion des programmes d'enseignement et de recherche se feront au niveau des différents départements qui composeront chaque collège. Cette organisation de l'Université de Toulouse en trois échelons université/collège/département avec une seule autorité centrale et une délégation des pouvoirs efficacement allouée entre les échelons correspond à la structure et à la gouvernance des meilleures universités dans le monde.

Cette structure est renforcée par la création de trois organes consultatifs. Le Sénat Académique (SA) représentera la communauté scientifique du site. Il sera constitué d'une trentaine de professeurs et chercheurs, dont le SA Restreint (SAR), qui est composé de 12 élus par et au sein de la communauté des meilleurs professeurs et chercheurs du site. Le SA pourra interpeller le DGE, le Directoire et le CS sur toute question académique.

Le Conseil d'Orient Stratégique (COS) est constitué de l'ensemble des parties prenantes à l'UT : collectivités territoriales, grandes entreprises partenaires, pôles de compétitivité, CESER, CHU, CLCC, CROUS, ... Le COS anime la réflexion sur la recherche et l'enseignement en lien avec les partenariats, en particulier dans les domaines de l'employabilité, de la recherche finalisée, de l'innovation, et de la valorisation socio-économique de la recherche.

Le Conseil d'Université (CU) regroupe les membres des différents Conseils de Collège (CC), qui sont eux-mêmes composés d'enseignants et de chercheurs, de personnels administratifs et d'étudiants. Les CC conseillent et soutiennent l'action de leur doyen respectif. Le CU constitue un large Forum démocratique de réflexion de l'Université de Toulouse.

Ces trois organes consultatifs sont utilisés par le CS et le Directoire pour éclairer leur politique. Aidé par les membres du Directoire, le DGE prépare le projet stratégique et le budget dont il a ensuite la responsabilité de l'exécution, il programme et exécute les actions

de l'UT, tandis que le CS valide le budget et la stratégie. De plus, le CS nomme et révoque le DGE et les directeurs délégués. Le Directoire est composé du DGE, de 4 directeurs délégués, 4 doyens de collèges et de deux représentants des organismes de recherche nationaux, dont le CNRS. Le Conseil de Surveillance sera limité à 12 personnes, dont 7 sont extérieures. Ces derniers seront désignés début 2012 selon une procédure originale qui garantit que leur qualité sera à la hauteur des enjeux. Les 5 autres membres du CS sont le président du SA, le président du COS, et trois élus au sein du CU : un enseignant ou chercheur, un membre du personnel administratif, et un étudiant.

### ***Un processus de fusion crédible et immédiatement créateur de valeur***

Cette transformation radicale du site sera pleinement opérationnelle en 2018. La transformation, initiée début 2012, se fera par étapes successives tous les deux ans. En 2012 l'ensemble des organes d'un Grand Etablissement à statut d'Université dérogatoire sont mis en place, et leur composition est pérenne, de manière à servir de centre stratégique pour la mise en place des réformes planifiées. Un Conseil de Préfiguration, qui deviendra le Conseil de Surveillance quand UT obtiendra le statut de Grand Etablissement, est constitué avec pour mission de recruter le DGE et les Directeurs Délégués.

Dès janvier 2014, les établissements universitaires existants, renommés « collèges », seront disciplinairement unifiés par un regroupement des unités de recherche et d'enseignement. Dans la période transitoire (le SA proposera une nouvelle structuration en collèges d'ici 2016), quatre collèges sont mis en place : le Collège « Toulouse Tech » (formé initialement des Ecoles d'Ingénieurs), le Collège « Sciences, Technologies & Santé », le Collège « Sciences Humaines & Sociales », et le Collège « Droit, Economie & Gestion ». Ces collèges homogènes changeront de statut en janvier 2016 dans le cadre du futur Plan Quinquennal. A cette date, ces collèges seront intégrés, notamment sur le plan budgétaire, au sein d'UT sous la forme d'établissements rattachés. Finalement, en janvier 2018, la dernière étape de la fusion est franchie : les conseils d'administration des Collèges se transforment en Conseils de Collège et les doyens des collèges sont nommés par l'UT, sur proposition des Conseils de Collège.

L'Université de Toulouse ainsi créée sera deux fois plus grande que la plus grande université d'Etat américaine. Le succès d'une telle institution sera donc intimement lié à sa capacité à associer les bénéfices des rendements d'échelle de la centralisation avec ceux de la flexibilité issus de la décentralisation. Certaines décisions devront être déléguées tandis que d'autres devront être centralisées, de manière à dégager un maximum d'avantages des externalités positives des efforts de chaque entité bénéficiant à l'image de l'ensemble. Dès 2012, UT sera responsable des missions suivantes : valorisation (SATT), relations internationales (RI), les programmes IDEX et la labellisation UT\*, la gestion des bibliothèques universitaires, la vie étudiante, les outils pédagogiques innovants et les systèmes d'information, l'opération campus. Les moyens financiers et humains correspondants seront transférés des collèges vers UT en conséquence. Ces réaffectations se feront à mesure des dévolutions, jusqu'à la centralisation budgétaire globale d'UT qui interviendra début 2016.

Chacune des étapes fera l'objet d'une évaluation au cours de laquelle les parties prenantes (Personnels BIATOSS, enseignants et chercheurs ; étudiants ; partenaires extérieurs) de l'Université seront consultées. Sur la base de ces évaluations les Doyens de Collège, en concertation avec les instances représentative de leur collège, et les autres membres du Directoire auront en charge de préparer le plan de développement de l'UT pour l'étape suivante. Ce plan de développement sera arrêté par le Conseil de Surveillance après avis des trois conseils qui l'entoure (SA, CU et COS).

## EXECUTIVE SUMMARY (ENGLISH)

Toulouse's academic environment boasts a wealth of diversity: 94,000 students, 7,100 researchers and professors, an array of laboratories enjoying a global reputation, 4 universities, 11 engineering schools, 6 institutes and schools, 3 RTRA/S, one SATT, 4 competitiveness clusters, one IRT, one Cancerology centre, 6 Research institutes (4 EPST, 2 EPIC), and an extremely dense network of companies developing applied research in partnership with the academic world, particularly in the fields of aeronautics, space and bio-engineering, for example. This makes Midi-Pyrenees the world's leading region for aeronautics and the European number one region for the space industry. The UT IDEX excellence initiative project, which has received massive support from the scientific community, the territorial authorities and the socio-economic sector, proposes a complete reorganisation of this set-up in order to create a single, world class university in Toulouse, a university which will stand at the very heart of the innovation ecosystem. It will be based on a common pact and a governance compliant with the highest international standards. It will provide a diversified curriculum, embracing interdisciplinarity for the purpose of giving all students access to curricula which correspond to their potential, with a special focus on training programmes of excellence.

### ***A Pact federating the campus' member establishments***

All establishments which currently make up the Toulouse and Midi-Pyrenees higher education and research hub will sign up to a joint Pact to seal their alliance. This Pact describes principles and rules of good practice which will be binding on the University as a whole, as from 2012, thus anticipating the policy which will be implemented by the university once it is merged. This Pact will be included, as a preamble, in the by-laws of each of UT's member establishments, thus making their implementation irreversible and coherent; failure to comply with the pact will result in a graduated response from UT, ranging from a recommendation to a freezing of resources, and even expulsion of the member in question. This Pact will concern all strategic aspects of the University's operations: human resources policy (inbreeding, recruitment process...), research, training, international relations and relations with partners.

### ***UT, a major player in the innovation eco-system***

Midi-Pyrenees heads the French regions in terms of overall intensity of Research and Development (public and private) compared with its GDP, with a percentage equal to 4.2%, of which 2.5% is generated by industrial R&D. This effort far exceeds European recommendations resulting from the Lisbon strategy, which set a threshold of 3%. This R&D activity has a direct impact on employment in the industrial sector, which has remained stable in our region over the past three years, despite a 10% decline in France overall. Finally, the Midi-Pyrenees region is ranked first in France for its GDP growth over the past ten years. Three major sectors structure this region: aeronautics, space and embedded systems (electronics, IT); agronomy; the cancer bio-health sector.

Thanks to funding from IDEX, UT will provide a boost to this industrial fabric via upstream research projects linked to long-term industrial and societal challenges: Strategic Thematic Actions (STA) will be launched in the three sectors - aeronautics, space and embedded systems; cancer, biology and health; agronomy - drawing upon the Science and Technology RTRAs for Aeronautics and Space, and the Cancer Therapy Innovation RTRS, and working hand-in-hand with the 3 corresponding competitiveness clusters, the AESE IRT, the TWB



platform and the SYNTHACS project. Governance of the STA will be open to the industrial partners supporting them, enabling the shared development of a strategic roadmap pertaining to the entire innovation chain, from fundamental research (STA) to valorisation (competitiveness cluster). With its technology transfer subsidiary, SATT, working in close collaboration with the Midi-Pyrenees business incubator, UT will federate and extend the whole research valorisation process, and will define and monitor progress on ambitious projects in the field of innovation, while supporting the creation of companies resulting from the research carried out in its laboratories.

UT will implement quantitative monitoring of these ambitious goals in the field of innovation.

***A perimeter of excellence compliant with the highest international standards***

UT will host within its midst a UT-certified\* perimeter of excellence, which will be an inspirational force for the entire campus. The initial perimeter is made up of the LABEX projects certified by the LABEX jury. To harmonise this structure with the excellence - both proven and emerging - of the campus, UT has established an open, efficient procedure for strengthening this perimeter. It is based on a Group of Scientific Evaluation (GSE), whose members are external researchers with scientific credentials at least on a par with those of the ERC juries. Inspired by a dynamic vision of excellence, UT will define its perimeter of excellence UT\* through successive adjustments, by adding teams benchmarked against public universities University of California, Los Angeles and University of Wisconsin, Madison.

When it comes to the curriculum, the UT\* perimeter will comprise programs certified by internationally recognised bodies or belonging to a world class international study network. In 2012, in conjunction with the GSE, UT will draw up the list of international benchmark labels and the list of world class networks of universities or schools. UT will set up logistical assistance programmes to ensure that courses wishing to obtain international certification or join referral networks can do so with the greatest possible hope of success. It will strive to ensure that all the campus' constituent elements are able to take advantage of the combined expertise of the programs belonging to the perimeter of excellence. Finally, programs which receive IDEFI certification will join the UT\* perimeter as soon as they are established.

For UT's scientific excellence to progress, the universities' own resources and those of IDEX must focus on strengthening UT's international competitiveness. To do so, five research programmes will receive IDEX funding: consolidation of the LABEX initiatives, Chairs (permanent and temporary), Equipment, Strategic Thematic Actions (STA), as mentioned above, and Cross-cutting and/or Emerging Scientific Challenges (CCESC) pertaining to societal issues. UT is committed to consolidating and securing long-term funding for the certified LABEX initiatives. The other IDEX-funded programmes are open to all teams working on the campus. All projects submitted for IDEX funding are assessed by the GSE on the sole basis of scientific excellence, according to criteria similar to NSF or ERC standards, for example. With these programmes, a policy designed to strengthen the university's appeal and to reverse the brain drain can truly be put in place. With the UT\* chairs programme, around one hundred chairs, for scholars who could otherwise hold a permanent position in the world top 20 in their field, will eventually be established, for an average period of 5 years; holders may apply for renewal. To improve the quality of the recruitment process, junior chairs are recruited on "tenure track" contracts established by

the colleges, with joint evaluation by the GSE (Group of Scientific Evaluation) and the host college during the sixth year.

### ***A totally redesigned portfolio of curricula and training programmes***

As a unified university, UT will seek to strengthen the appeal of the programmes provided by its colleges, particularly in the UT\* perimeter. This means setting up ambitious reforms of its curriculum in order to rise to the challenges associated with the economics of knowledge. At the doctoral level, UT's ambition is to significantly increase the number and the quality of the doctorates awarded each year in Toulouse, and to acquire the resources necessary to meet this target. To achieve this ambitious goal, UT will develop "research" paths starting at M1 level, which will include, for example, a long research internship in a laboratory for engineering students.

The "Site Doctoral College" will be transformed into a UT School of Doctors, with its own by-laws and the necessary means to put in place a better organisation of appealing doctoral programmes, to better coordinate doctoral studies and to raise the value of the doctorate. An "Engineering for Industry" doctoral certification will be set up to increase the employability of PhDs in this field. At the undergraduate and Master levels, programmes will be more diversified in order to allow each student to follow the course best suited to his or her needs. Progressively more demanding UT\* certified programmes will be available for the most gifted students, with appropriate programmes put in place for other students. Specific academic resources (additional classes, research projects, internships in laboratories or companies, international programmes taught in English...) will be established with a view to developing the excellence of these study programmes.

By 2016, the aim is to reach a flow of 1,000 graduates in Bachelors\* and Masters\* programmes. Accordingly, UT will reduce student failure and drop-out, while encouraging excellence. At the undergraduate level, multi-disciplinarity will be encouraged, and each college undertakes to devote one half-day per week exclusively to transverse learning. Moreover, the number and diversity of dual-disciplinary and major-minor Bachelors and Masters programmes will be increased. More highly concentrated teaching modules will also be made available in June/July (summer courses). Students may also opt for a substitution semester (one semester of supplementary studies chosen by the student at another establishment on the campus, for programmes shared between establishments). For more significant exchanges between masters and engineering studies, the substitution semester will lead to a joint master-engineering school diploma. The aim of UT is to build on its vast wealth of academic expertise to provide students with original, multi-disciplinary study programmes. The *Toulouse Tech*<sup>®</sup> college will bring together all the campus' engineering schools. In addition to the obvious benefits in terms of research, the campus also has much to gain in terms of international appeal (researchers, students), studies (cross-disciplinary courses, teaching practices), industrial partnerships (funding of chairs, foundations...) and relations with organisations and major establishments.

Alongside the creation of *Toulouse Tech*<sup>®</sup>, UT aims to set up new engineering courses to meet the needs of Midi-Pyrenees industry, whose growth is currently restricted due to a shortage of engineers and engineering PhDs.

Thanks to a partnership between *Toulouse Tech* and the Sciences, Technology and Health College, UT intends to cover 10% of the national flow (3,000 engineering graduates each year) and thus consolidate our region's strength in this field. By demand from the region's

industry, a "Bachelor\*" in engineering will also be added to the curriculum. Numerous activities will be pooled: quality assurance, certificate of excellence in engineering (EUR-ACE®), international initiatives, continuing education, tutorial work platforms, ambitious policies to develop training courses in innovation, entrepreneurial studies...

### ***Optimised governance***

To achieve these goals, UT's structure and governance will conform to international standards. On 1st January 2018, UT will be headed by a Chancellor with wide-ranging executive powers delegated by an independent Supervisory Board. The Chancellor will chair an EXCO responsible for implementing UT's policy and executing the tasks assigned to it. UT will comprise a small number of colleges, whose deans will be appointed by UT. Their resources will also be allocated by UT.

By 2014, each college will be disciplinarily homogeneous, which will require substantial regrouping of research and teaching teams between existing establishments, while allowing dual affiliation for some researchers in order to encourage inter-disciplinarity. Scientific coordination and management of teaching and research programmes will take place at departmental level in each college. UT's three-tier organisation - university/college/department - with a single central authority and efficient delegation of authority between the tiers corresponds to the structure and governance adopted by the world's top universities.

This structure is strengthened by the inception of three consultative bodies. The Academic Senate (AS) will represent the campus' scientific community. It will be made up of around thirty professors and researchers, including the Restricted AS (RAS) comprising 12 members elected by and from the campus' elite community of professors and researchers. The Academic Senate may question the Chancellor, the EXCO and the Supervisory Board on any academic matters it sees fit.

The **Strategic Foresight Committee (SFC)** is made up of all UT's stakeholders: territorial authorities, major partner companies, competitiveness clusters, CESER, CHU, CLCC, CROUS ... The SFC coordinates reflection on research and teaching linked to partnerships, particularly in the fields of employability, finalised research, innovation, and socio-economic research valorisation.

The **University Council (UC)** brings together the members of the various College Councils (CC). The CCs are made up of teaching staff, researchers, administrative personnel and students. The College Councils advise and support their respective dean in the action they undertake. The University Council is UT's extended Forum of democratic debate.

These three bodies advise the Supervisory Board and the EXCO on policy matters. Advised by the members of the EXCO, the Chancellor prepares the strategic project and budget which he or she is then responsible for implementing; he or she schedules and implements UT's actions, while the Supervisory Board approves the budget and strategy. Moreover, the Supervisory Board appoints and revokes the Chancellor and the directors. The EXCO is made up of the Chancellor, 4 thematic directors, 4 deans of colleges and 2 representatives of the national research organisations, including the CNRS. The Supervisory Board will be limited to 12 members, 7 of them external. The latter members will be appointed at the beginning of 2012, via an original procedure designed to ensure that the quality of membership is in keeping with the importance of the issues at stake. The 5 other members of the Supervisory Board are the president of the Academic Senate, the president of the SFC, and three elected

representatives from the University Council: a professor or researcher, a member of the administrative personnel, and a student.

***A sustainable merger process, with immediate added value***

This radical transformation of the campus will be fully operational in 2018. Initiated at the beginning of 2012, the transformation will take place in successive stages, every two years. In 2012, all the boards and bodies of a "Grand Etablissement à statut d'Université dérogatoire" (major academic establishment with an operational status equivalent to a university) will be in place, with a long-term membership, thus forming the strategic centre of implementation of the planned reforms. A founding Board to become the Supervisory Board when UT is granted the Grand Etablissement status is created; its mission is to recruit the Chancellor and the deputy Directors.

In January 2014, the existing university establishments, now known as "colleges", will be disciplinarily unified by regrouping the research and teaching units. During the transitional period (the Academic Senate will propose a new college-based organisation by 2016), four colleges will be set up: "Toulouse Tech" College (initially made up of the Engineering School), the "Science, Technology & Health" College, the "Social Sciences and Humanities" College, and the "Law, Economics & Management" College. These homogeneous colleges will change status in January 2016, under the terms of the future "Plan Quinquennal". At this time, these colleges will be integrated into UT, notably in terms of budget, in the form of subsidiary establishments. The final stage of the merger will take place in January 2018: the Colleges' boards of administration will become College Councils and the college deans will be appointed by UT, on proposal by the College Councils.

The newly established University will thus be twice the size of the biggest U.S. State university. The success of this type of institution will therefore largely depend on its ability to combine the benefits of efficiency of scale through centralisation and the advantages arising from the flexibility of decentralisation. Some decisions will have to be delegated and some centralised, in order to gain maximum benefit from the positive externalities generated by the efforts of each entity, taking full advantage of the image of the university as a whole. In 2012, UT will be responsible for the following tasks: valorisation (SATT), international relations (IR), IDEX programmes and UT\* certification, management of university libraries, student life, innovative teaching resources and information systems, campus operations. The corresponding financial and human resources will be transferred from the colleges to UT, accordingly. These re-assignments will take place progressively, as responsibilities are devolved, up until overall UT budgetary centralisation, scheduled for the beginning of 2016.

An assessment of each stage will be carried out, during which the University's stakeholders (BIATOSS personnel, teaching staff and researchers; students; external partners) will be consulted. Based on these assessments, the College Deans, in consultation with their college's representative bodies, and the other members of the EXCO, will be responsible for drawing up UT development plan for the next stage. This development plan will be confirmed by the Supervisory Board after submissions by its three advisory bodies (Academic Senate, University Council and Strategic Orientation Council).

## 4. DELTA DOCUMENT

This IDEX project retains all the strengths of the version submitted in May but remediates the weak points by introducing major changes described hereunder. The “detailed questions and recommendations of the jury” are taken on board, examined and the proposed changes analyzed.

### A. Characteristics of the unified UT

#### *Radical changes: an overview*

Last summer, a large number of prominent researchers and academic leaders spanning all universities and Grandes Ecoles in Toulouse have strongly recommended a much more ambitious project for the IDEX2 competition. In particular, many of them have suggested a complete merger of the different academic institutions of the site into a single University with a strong international ambition. This step represents a major breakthrough in the history of the scientific community in Toulouse over the last 5 decades. The project presented in this document is in line with their proposal. It is based on the ambition to create a unified University of great international repute in Toulouse, whereby the efforts of each UT component benefit the entire community in terms of prestige and attractiveness. Four disciplinary coherent colleges are created:

- College of Engineering Schools “Toulouse Tech (TT)”;
- College of Science, Technology and Health (STH);
- College of Social Sciences and Humanities (SSH);
- College of Law, Economics and Management (LEM).

The University of Toulouse emerges as a crucial global player in Southern France in the international competition for intellectual leadership. This will be of benefit to our students, our people, and our economy as a whole (innovation, expertise, production of socio-economic externalities, role of university as an agora feeding the public debates,...).

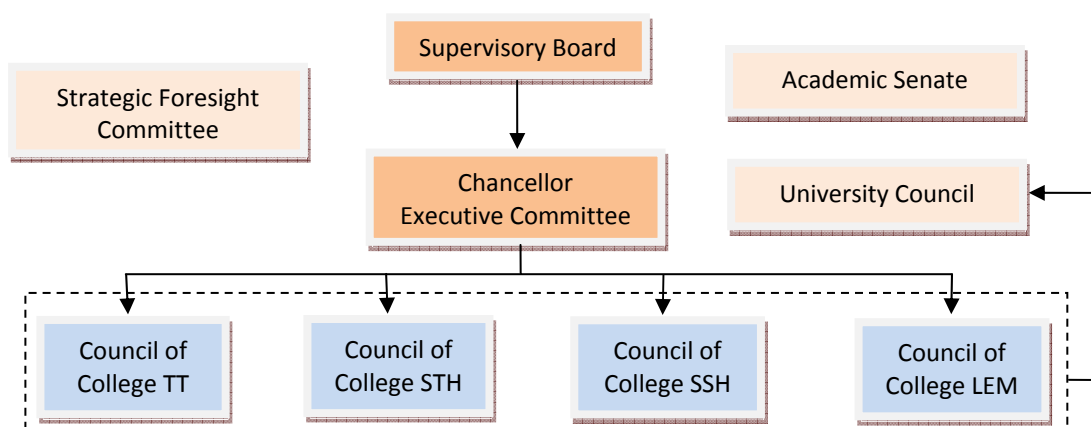
Unlike the previous T-IDEX project, the structure of the new project wholly transforms the current organization of research and higher education in Toulouse. The implementation of the project will have immediate effects such as the complete ban of endo-recruitment at junior level, a better process for junior and senior recruitment, the guarantee of zero-discrimination against outsiders for senior recruitment, the promotion of the tenure-track system in fields whenever and wherever it is the international standard, the creation of bi-disciplinary undergraduate programs, and a culture of evaluation of academic outputs at the collective and individual levels.

The credibility of these reforms is based on the signature of a Pact (section 5.3.1) by the different stakeholders of this IDEX project. The Pact is enacted in their statutes, and its implementation is conducted under the control of the independent government bodies of UT. The Pact anticipates on the academic policy that the unified University of Toulouse will apply to its colleges after the complete merger of the current academic institutions.

### ***New Governance***

The nature of the project Toulouse-IDEX submitted in May 2011 was different. It focused on the perimeter of excellence and on the allocation of IDEX funding, under the control of a new institution, the T-IDEX foundation. In parallel, the current PRES was to be replaced by a Federal University of Toulouse, with loose relationships among its members and a weak central governance controlled by the members of the federation.

In the new project, the University of Toulouse is governed in 2018 under the best academic standards. In the new project, the University of Toulouse governance in 2018 will meet the best academic standards. The following diagram describes the governance structure of UT (see section 5.4.1).



The new project of governance is innovative in many respects:

- In 2018, a single university will be in control of a set of disciplinary coherent colleges.
- The global governance of the site is simplified by terminating the PRES, all boards of directors except the UT Board, and by regrouping research units and educational programs into global fields. Unlike the T-IDEX project, we do not create an independent foundation in charge of managing IDEX resources.
- There is now a single captain in command of UT: The Chancellor, who holds large responsibilities by delegation from UT's Board for the day-to-day management of the university. The Chancellor is assisted by an efficient Executive Committee (EXCO).
- The supreme governing body of the site is the Board, which consists of 12 directors, 7 of whom are outside, independent members without any conflict of interest with respect to the community.
- In addition to the Academic Senate (AS) and the Strategic Foresight Committee (SFC), the Board and the EXCO are given advice and recommendations by a third advisory council, The University Council (UC) which represents the colleges in the governance of UT. Its members are members of the Councils of the Colleges. The UC elects three of its members to seat on UT's Board (one student, one representative of the administrative staff, and one representative of teachers and researchers).

### Transition

The document also describes the credible and transparent 2012-2017 transition period as illustrated in the table below:

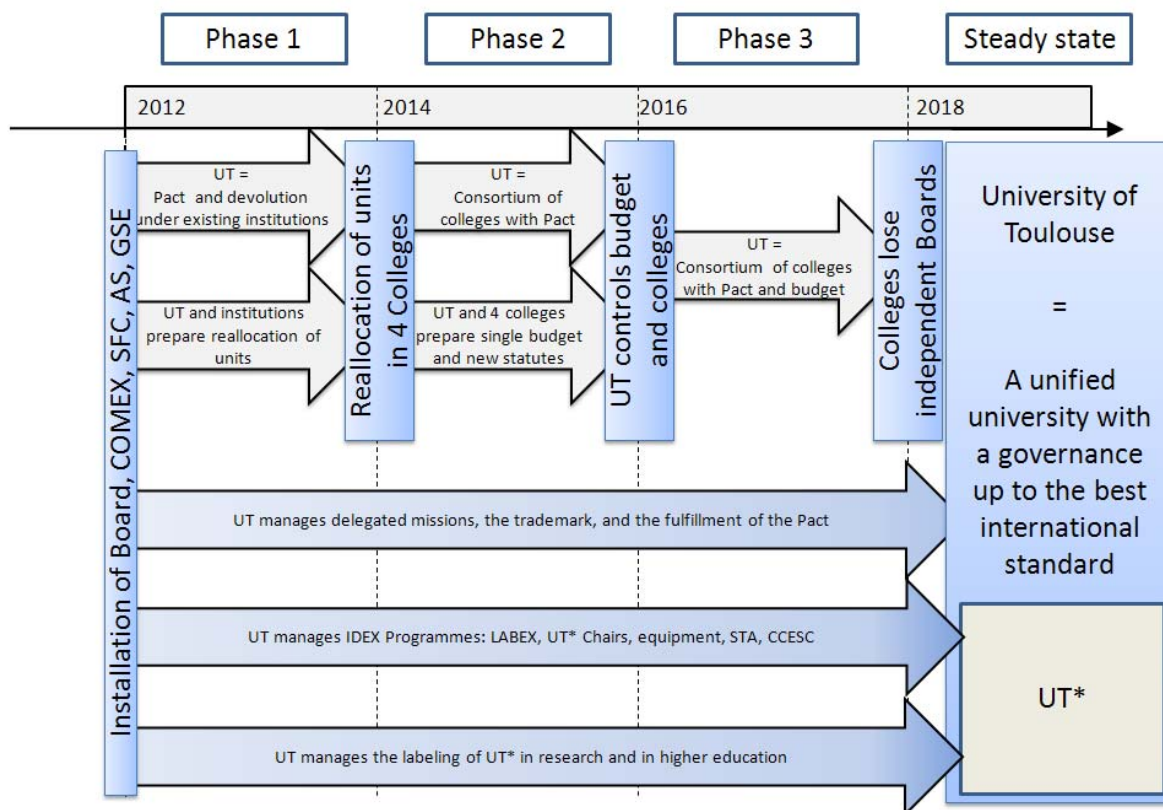


Chart: Process of transition 2012-18

The transition process is detailed in section 5.4.2. Here is a partial list of the timing of critical reforms having a transforming effect on the structure of UT:

- Early 2012 to 2014: Creation of the perennial governance entities of UT: (Founding) Board, EXCO, SFC, UC and AS. Recruitment of the Chancellor after an international search process. Implementation of the Pact by the members. Progressive transfer of delegated missions from members to UT, accompanied by a transfer of personnel and financial means.
- January 2014: Transfer of research units and teaching programs to the members in order to create 4 disciplinary coherent colleges.
- January 2016: Universities and Grandes Ecoles change their statutes to formally become colleges (under “article 43”) of UT. The UT gets full control of the global budget and allocates it among the different colleges. UT holds a golden share in the boards of its colleges.
- January 2018: Colleges change their statutes from “article 43” to “article 33”. That is, the colleges transform their Board into a Council of College (CC), UT selects the deans of colleges, and UT can overrule the decision of their CC.

The Board and the EXCO of UT oversees these transformations, after consulting the stakeholders of UT and its members. The Academic Senate will also contribute to this process by making recommendations on research and higher education. In the transitional period, UT uses the Pact and the IDEX funding to promote excellence among its colleges. The IDEX funding is concentrated on the perimeter of excellence UT\*.

### ***New perimeter of excellence***

UT target is to secure a position in the international top 100 within the next 20 years. However, UT recognizes that the leap forward will not be uniform. That is why UT will concentrate most of the IDEX funding on its perimeter of excellence, and will further reallocate a significant share of its own non-IDEX resources to it. UT's objective is to create a perimeter of excellence UT\* whose academic performances are similar to those of a combination of the University of California at Los Angeles (UCLA, ranked 12<sup>th</sup> in ARWU) and of the University of Wisconsin at Madison (UW-M, ranked 19<sup>th</sup>). Thus, UT's criterion for a research unit or teaching programme to belong to its perimeter of excellence UT\* is to rank accordingly in its own field.

In order to succeed, the previous project has been amended. First, the initial perimeter of excellence is now limited to the selected LABEXes (section 5.2.3). Beyond this, UT's GSE puts in place a procedure to label excellence. Research teams labeled UT\* receive recurrent funding from UT and its colleges; funding is based on scientific production and prestige rather than on the size of the team. This funding does not become a vested right: The excellence of labeled research teams will be periodically assessed, and UT's mission in this area includes the delabelling of marginal teams and labeling of new and more dynamic ones. UT thereby becomes the tool to engineer new LABEXes".

Besides, the UT\* label is also conferred on educational programs of excellence. In the T-IDEX project, this mechanism was associated with the creation of the ENS in Toulouse. In the new project, excellence in education is not attached to a single institution such as the ENS. UT prefers to support the emergence of elite educational programs within the existing colleges, according to a bottom-up approach. Indeed, UT is committed to identifying and promoting top educational programs within its confines. The demanding label UT\* serves as a signal to students (from France and overseas) and to potential employers alike. Here are some examples of elements taken into account: Selectivity, class size, professors' office hours, on-line student evaluations, bilingual courses, exchange programs with prestigious universities... Concerning bachelor's and master's degree programs, UT will use the international standards provided by some external certification mechanisms existing in various fields (engineering, management...), in order to give the right quality signal to elite students.

UT's realistic ambition is to create a hard core of centres of excellence in research and training, a genuine academic spearhead. The momentum is entirely focused on this coherent cluster capacity to emerge as a strong leader in the international competition for scientific excellence. At the same time, this momentum is an inspirational force for the entire campus, ensuring that excellence is part of the fabric of the existing colleges.

### ***A new educational offer***

In the field of training, our aim is to benefit from this major drive to scientific excellence in order to reinforce our educational programs and to strengthen the links between research, training, innovation and economic development, particularly within our perimeter of excellence. In the T-IDEX project submitted in May 2011, the main actions in the higher



education field were based on the creation of both an ENS and a common Doctoral School (*Ecole des Docteurs*). The ENS project has been abandoned and the Doctoral School is further developed in the new project (section 5.3.5.4). Moreover the establishment of the unified UT composed of different colleges will prompt new initiatives. Among them, the creation of selective bachelors programs (Bachelor “Star”) including dual disciplinary ones will open the way to excellence at undergraduate level (section 5.3.5.1). UT will privilege flexible bachelor degrees with a more progressive students’ specialisation in terms of discipline, strength and complexity. The best bachelor students within and outside UT will be selected for the elite UT Master programmes, and then in UT’s PhD schools. Thus, UT global educational portfolio does not leave any student behind but can offer its elite students access to the frontier of knowledge. In addition to the inception of the College Toulouse Tech, the engineering educational offer will include new courses in engineering (Bachelor and Master degrees) to meet the growing needs of the regional industry (especially the aeronautics and space industry) and to reach 10% of the national flow, i.e., 3,000 engineering degrees per year (section 5.3.5.2).

The objective of UT is also to capitalize on its unique span of academic knowledge and resources to offer multidisciplinary training programmes. These programmes are designed to meet employers’ demand for new competences and to enhance graduate students’ employability. Under the Pact, all colleges agree upon common principles to guarantee the project feasibility: A common weekly slot (half a day) dedicated to multidisciplinary training, mutualised class rooms, teaching load dedicated to multidisciplinary study programs (section 5.3.5.3). Finally UT commits to an ambitious Quality and Performance Certification of its higher education training programs according to an international-based approach (section 5.3.5.5).

### **Human Resources Policy**

The human resources policy of the University of Toulouse is now based on a twofold strategy. First, 80% of the IDEX funding will be allocated to programmes aiming at improving the attractiveness of its research units “at the top”. Junior and senior chairs will be competitive on the market for the best researchers around the world.

In this project, young PhD recruited on chair positions, together with some other junior positions opened by UT’s colleges, are offered contracts along the 'tenure track' principle, but adapted to the restrictions of French law. Technically, we intend to approximate the status of 'assistant professor', an international standard in the academic world (section 5.6). The fundamental characteristic of this status is a promise of tenured professorship after 6 years to an academic evaluation by peers. The new strategy presented in this document differs from the T-IDEX one. The French LRU law enables us to offer a sequence of 2 fixed term contracts (CDD), lasting 3 years each. In partnership with the colleges, UT assesses the chair holder’s academic achievements during the 5<sup>th</sup> year, based on the criteria and procedures enforced worldwide (comparative external letters, evaluation by an ad-hoc internal committee, etc). This process determines whether the college offers a permanent full professorship to the chair holder.

In the new project, as early as 2012, the colleges will strive to adapt their human resources policy to the best international practices. These commitments are integrated in a Pact that all UT’s stakeholders have accepted in December 2011 (section 5.3.1). Endo-recruitment at junior level will be immediately reduced, with the obligation to fully suppress it by 2018. Colleges are committed not to discriminate against outsiders in the recruitment procedure

of full-fledged professors. The composition of the selection committees in charge of the selection of junior and senior professors is supervised by the Chancellor of UT and the EXCO. The committees will include an outsider, “advocate of excellence” representing the Chancellor. Another commitment of the colleges is to transfer the decision-making process for the allocation of their “Primes d’Excellence Scientifique” (PES) to UT, which uses the GSE to advise the EXCO on this matter.

### ***IDEX research programs***

This aspect of the project, which was very positively evaluated by the IDEX jury in June 2011, has been integrated to the new project with little change. Four IDEX programmes (support to LABEXes, chairs, equipment, and interdisciplinary research) described in the T-IDEX project of May 2011 are remain unchanged. The Emergence Programme has been merged with the interdisciplinary Programme CCESC. A fifth IDEX Programme is created to support Strategic Thematic Actions (STA) (section 5.3.2). It earmarks IDEX funds in favour of communities that are most strategic to the regional industry: engineering, agronomy and life science. The main aims of these five programmes are to boost scientific excellence among the best research teams of the site, and to support the emergence of other excellent research units. The allocation of the IDEX funds in favour of chairs, equipment, CCESC and STA is proposed by the GSE to the Chancellor after a thorough scientific evaluation by the GSE of the scientific quality of the submitted projects (section 5.3.3). The GSE is composed of first-class scientists from outside Toulouse; their international scientific credentials are on par with those of the members of ERC selection committees. Its composition is determined by the Board of UT.

## **B. Replies to the *questions and recommendations of the jury***

***“The loose relationship between the IDEX foundation and the proposed Federal University of Toulouse is unlikely to lead to the institutional transformation envisioned by the IDEX.”***  
AND ***“Clarify and strengthen the relationship between the IDEX foundation and the proposed Federal University of Toulouse.”***

The project of the creation of the Toulouse-IDEX foundation has been definitely discarded. The project is now global, and impacts the entire community, well-beyond its perimeter of excellence, thus yielding a complete merger of the academic institutions within a few years as explained above (section 5.4.1).

***“Reconsider the perimeter of the University by taking into account the strong engineering components in Toulouse.”***

Given its important (but currently not coordinated) strengths in the field of engineering, UT has decided to create a specific College, Toulouse Tech<sup>®</sup>, which assembles the 12 engineering schools of the site into a single institution fully integrated to UT (section 5.3.5.2). As a first step, Toulouse Tech<sup>®</sup> launches in 2012 a series of structural actions to increase visibility, enhance coordination, and pool general services: joint calls for research activities (projects, researchers mobility...), a single portal to promote engineering training, common executive education service, creation of a common Observatory of skills and jobs, new scientific courses in English; system of semester exchanges for students and faculty...

The next step is to charter in 2016 the Toulouse Tech<sup>®</sup> College as a “Grand Établissement” that brings together all the engineering schools of the site: INP-ENSAT, INP-ENSEEIH, INP-ENSIACET, INSA, ISAE, EMAC, INP-ENIT, INP-ENM, INP-EIPurpan, INP-ENVT, ENAC, ISIS, UPSSITECH. This strong structuring project goes together with the termination of INP, the university which brings already together 7 of the Grandes Ecoles of the site.

***“It is not clear that the creation of an ENS would simplify, rather than complicate, the already complex institutional landscape.” AND “The jury invites the proponents to reconsider the need for the ENS and to look at other means of encouraging selectivity and excellence for undergraduate students.”***

The ENS project has been abandoned. Elite undergraduate programs (labeled Bachelor\*) managed by UT’s colleges are launched. Our goal is to graduate 1,000 students a year by 2016 (section 5.3.5.1).

In these programmes, selectiveness and excellence are achieved through the combination of both gradual specialisation, and progressive selection during the three years of the bachelor degree. The process is to identify students’ capabilities, and guide them to build an adequate professional project in order to reduce failures and dropout. It will also promote excellence by identifying the very best students and proposing them very high standard programmes. Unique academic resources (additional classes, research projects, internships in labs or firms, fully international programs taught in English...) will help develop excellence of bachelor degrees. In science, the objective is to offer 8 such Bachelor\* programs (in mathematics, physics, chemistry, computer science etc...) within the next four years. Students in social sciences will be offered double-major Bachelor\* programmes that will allow them to discover various fields and to graduate in two disciplines (e.g. art history and archaeology, law and economics), thereby enhancing their attractiveness. This progressive selection in excellence bachelors/ this stepwise selection in bachelors programs of excellence will also build bridges for students and link up UT components. For instance students holding a two-year intermediate degree (DUT) can enrol the third year of the Bachelor\* programs. Bachelor\* programs prepare university students to go for selective Master programmes (in engineering, management and other fields) through adapted competitive exams. Thus the development of these undergraduate excellence bachelor programmes constitutes a key device to bridge the gap between universities, institutes and Grandes Écoles, through the dynamics described in this proposal.

***“Firm developments and a stronger vision in building bridges and cementing strong relationships with the entire spectrum of engineering schools and other higher education and research institutes in Toulouse would have been expected.”***

UT creates a “College of Engineering” which assembles the 12 engineering schools of the site into a single institution fully integrated into the UT: Toulouse Tech.

The academic landscape is completely reshuffled, the existing institutions being replaced by colleges that are disciplinary coherent, within UT. This new organization builds up solid bridges between the different UT components in both higher education and research.

**As far as doctoral training** is concerned, 9 of the 15 Graduate Schools in Toulouse are already shared by Universities and engineering Schools. In 2011, 160 PhD grants/contacts

financed both by Paul Sabatier University and the engineering Schools followed the same common selection process organized by the joint Graduate Schools. This policy will be pursued and extended to the other fields with the creation of the *Ecole des Docteurs* of UT and the delivery of the Doctorate of UT (section 5.3.5.4).

**In the field of engineering**, the creation of the unified university UT allows us to launch ambitious actions involving both the college Toulouse Tech and the college STH (section 5.3.5.2). These actions aim at increasing the number and the quality of graduates in engineering. This is a demand of local industries which suffer from a lack of engineers in several specialties. These actions include:

- The creation of new joint Master degrees between the College Toulouse Tech and the College STH;
- The creation of a Bachelor of Engineering (Bachelor\*). Following the request of local industries and in partnership with Toulouse Tech, a Bachelor of Engineering is created by the college STH with an initial flow of 100 students per year, to reach 200 to 300 graduates within the next 10 years. As with all the engineering programs of UT, this program has to fulfill the requirements to get the quality assurance label of excellence in engineering EUR-ACE®;
- The development of common training laboratory platforms in strategic fields such as Nanoelectronics/Nanomaterials, Mechanics, Process engineering...;
- The development of common training to innovation and entrepreneurship...

**As for research activities**, the 12 engineering schools and the universities already share a very large number of research laboratories (one of the highest percentages in France). This includes human resources (researchers, technicians and administrative staff), buildings and annual funding. In addition, the national research organizations CNRS, INRA, INSERM and IRD are strongly involved in these laboratories. In the field of Material Sciences for instance, 60% of the researchers and the lecturers work for laboratories which depend both on University and engineering Schools. In the center of competence “Mathematics, Information, Engineering sciences and Technology”, this percentage reaches 100 %. This process is amplified through the creation of the unified University of Toulouse by facilitating the exchange flows of staff and students between the different colleges, especially SHT and Toulouse Tech (section 5.3.5.3).

***“In order to build a successful IDEX, Toulouse will need to mobilize its best and most appropriate science groups.” AND “Mobilize the best science groups in responding to future IA funding opportunities.”***

- The PRES has mobilized four very active working groups to prepare the new project, whose main orientations have been validated by the community of the directors of research centers early in the process.
- The “Strategic Thematic Actions” (STA) Program earmarks IDEX funds to our main research forces in Toulouse: Engineering, agronomy and life sciences (section 5.3.2).
- Seventeen new LABEX projects and 14 EQUIPEX projects have been submitted to the second wave. In the field of higher education, 9 IDEFI proposals have also been submitted to support the UT collective ambition to attract and to train the best students (section 5.2.2).

- The Academic Senate which represents the excellence of the site has been set up (section 5.4.1).

***“There is a need to further develop a vision as a research university that takes advantage of the industrial strengths of its region.” AND “Further develop a vision as a research university which exploits its regional advantages.”***

First, it is noteworthy that one of the PRES’ Working Groups in charge of shaping the new IDEX project, comprising six enterprise leaders, has been chaired by the CEO of a prominent local company.

Second, the ecosystem of Toulouse and its region is developed around three strong scientific competences: 1. aeronautics, space and embedded systems, 2. biology and health and 3. agronomy. In order to strengthen the R&D partnership between these local industries and academic research in these fields, UT has decided to create a new IDEX programme entitled “Strategic Thematic Actions (STA)” (section 5.3.2). This STA programme will provide earmarked IDEX funds to promote long-term coordination and support to research by positioning itself upstream of technological developments with the local industrial leaders and clusters. The applied research work is taken on board by partners (IRT, industry, clusters...) in order to mature the resulting technologies. The organization of this innovation chain guarantees a coherent approach driven by scientific skills and market needs. In parallel the links between the IDEX project and formerly labeled IRT, SATT, TWB and the 8 “Instituts Carnot” have been optimised (section 5.3.8).

Finally, local prominent industrial sectors have taken a proactive position in favor of the creation of UT by committing themselves to implement the following actions:

- Creation of an industrial chair by the company EADS on “Multifunctional Nanomaterials and Nanodevices” (December 2011). Another industrial chair funded by Airbus on “Embedded systems” should also be created soon.
- Commitment of industry to provide over 10,000 hours of training in UT courses.
- Guaranteed industrial internships for new engineering programmes.

***“The IDEX proposal fails to develop a shared vision of a strong university in Toulouse, which aligns historical strengths with future ambitions, through workable and efficient governance.”***

In 2018, Toulouse will boast a unified university UT (with its perimeter of excellence UT\*) of international repute, endowed with a best-practice governance (section 5.4.1).

***“Restructure the proposal to reflect the successful IA projects”***

The document’s emphasis on UT, IRT, SATT, TWB, and LABEXes delineates a project and an ecosystem that will be conducive to innovation and academic excellence in research and higher education in Toulouse.

## 5. DETAILED DESCRIPTION OF THE PROJECT

### 5.1. AMBITION AND STRATEGY OF THE PROJECT

#### ***Ambition***

Within the next 7 years, the University of Toulouse will be a unified academic institution at the centre of a strong ecosystem of innovation, and a key player in the international competition for the intellectual leadership. Its ambition is to belong to the top 100 universities in the world. Its dynamically evolving excellence perimeter UT\* will unite research units and teaching programmes in the top 20 league in terms of academic achievement and attractiveness.

#### ***Strategy***

UT's collective strategy in relation to this ambition takes several forms:

- In the transitional period, UT's components are committed to a legally-enforceable Pact, a credible coordination scheme in favour of excellence. The Pact imposes transparent principles for teaching, research and recruitment, which constitute a leap forward in the French academic context. (section 5.3.1)
- IDEX funds are earmarked for scientific excellence, international attractiveness, and reverse brain drain, with a large leverage effect. An ERC-like external scientific committee is responsible for the allocation of funds, under the supervision of the Chancellor. (section 5.3.3)
- UT will develop research projects building on strong local scientific components (engineering, agronomics and bio-cancer) in partnership with local industrial forces and clusters. Interdisciplinary projects will also be promoted in a bottom-up fashion. (section 5.3.3)
- UT's supply of teaching programmes will be optimised to the benefit of UT students. Broad based and/or interdisciplinary bachelors will be offered, with an efficient orientation of students according to their revealed talents and aspirations. "Star" programmes will attract best students. (section 5.3.5)
- The international attractiveness of UT will benefit from the strong spill-over effects generated by the unified university, and by an ambitious project to create a single UT campus in a strategic foreign location. (section 5.3.7)
- As early as 2012, UT's governance will fit the best international standards, with an independent Board and a Chancellor benefiting from vast delegations of power. Academic representation is provided by an Academic Senate and a University Council. (section 5.4.1)
- Within the next two years, UT will coordinate the migration of research units and teaching programmes into 4 disciplinary coherent colleges that will replace the existing academic institutions. In particular, the "Toulouse Tech" college will gather the 12 engineering schools of the site. (section 5.4.2)

## 5.2. STRUCTURE AND CHARACTERIZATION OF THE INITIATIVE OF EXCELLENCE

### 5.2.1 PRESENTATION OF THE PROJECT LEADER (INCLUDING THE LEGAL STATUS)

The project leader, the PRES of Toulouse, will disappear as soon as the Grand Établissement "University of Toulouse" is created in 2012. The University of Toulouse has:

- more than 94,000 students, including nearly 14,000 foreign students;
- awarded more than 29,500 diplomas in 2008-2009;
- 165 recognised research units;
- supported 755 theses in 2009, in the 15 doctoral schools;
- 7,100 teachers, teacher/researchers and researchers;
- 5,800 administrative and technical staff.

The PRES of Toulouse was created in 2007 with the support of the regional authorities in order to ensure a greater visibility, to be the unique point of entry for students, to share a certain number of activities and to undertake new programmes: *"Created by decree on 21 March 2007 in the form of an EPCS (Établissement Public de Coopération Scientifique - Public Establishment of Scientific Co-operation), the PRES (Pôle de Recherche et d'Enseignement Supérieur - Research and Higher Education Cluster) of the University of Toulouse is an ambitious co-operative organization that aims to establish the Toulouse Midi-Pyrénées university campus at the highest European and international level."*

PRES is an association between universities, Grandes Ecoles, national research institutions, companies and regional authorities. PRES members define action priorities through their bureau (comprising 6 founding members) as well as the resources necessary to achieve them. The bureau recommends an action plan to the Board that is implemented by the various PRES departments, which have contributed to drawing up the plan beforehand; PRES departments bring together the skills of each institution in the various fields concerned, thus ensuring that the institutions are represented.

Over the past 4 years, PRES has acquired experience in sharing its resources and projects, reflecting the assignments entrusted to the University of Toulouse concerning:

- *syndication of the overall training offer;*
- *promotion of research as well as coordination of doctoral schools;*
- *development of European and international relationships;*
- *improvement of student services;*
- *maintenance of the network of libraries and documentation centres;*
- *coordination of major campus projects: Toulouse Campus, IDEX, IRT, etc.*

The University of Toulouse currently has 17 higher education and research establishments, 6 of which are founding members:

- Université Toulouse I Capitole, UT1-Capitole;
- Université Toulouse II Le Mirail, UT2;
- Université Toulouse III Paul Sabatier, UPS;
- Institut National Polytechnique de Toulouse (7 grandes écoles), INP;
- Institut National des Sciences Appliquées de Toulouse, INSA;
- Institut Supérieur de l'Aéronautique et de l'Espace, ISAE.

And 11 associate members:

- Centre Universitaire Jean-François Champollion, CUFR;
- École des Mines d'Albi-Carmaux (Mining School), EMAC;
- École Nationale de l'Aviation Civile (National Civil Aviation School), ENAC;
- École Nationale de Formation Agronomique (National School of Agriculture), ENFA;
- École Nationale Supérieure d'Architecture de Toulouse (National School of Architecture), ENSAT;
- Groupe École Supérieure de Commerce de Toulouse (Toulouse Business School), ESC;
- Institut Catholique d'Arts et Métiers de Toulouse (ICAM School of Engineering);
- Institut d'Études Politiques de Toulouse (Institute of Political Studies), IEP.

The PRES is the result of a long period of work on structuring this regional research, training and innovation area: it has promoted its potential in terms of expertise and synergy in 6 centres of competence. The region stands out through the strength of its partnerships between academic research and socio-economic players. These partnerships involve all high-tech business sectors, which characterise the regional economic fabric: the space industry, embedded systems, the aeronautics sector, Information and Communication Technologies, eco-industries, health and the agri-food industry. Within these sectors, the region hosts major international companies that are leaders in their fields, such as Airbus, EADS, Dassault, Thales, SNPE, Alstom, Continental, Pierre Fabre, Sanofi-Aventis, Syngenta, Euralis, Air Liquide, EDF, etc.

The four clusters of competitiveness, linked to the Toulouse campus and representing more than 725 companies in 2008, are the major components of this ecosystem. Of these, three centres play a special role in the region: the "Aeronautics, Space and Embedded Systems" centre, known as Aerospace Valley, a centre of global competitiveness; the AgriMip Innovation centre, which brings together the main academic and economic players in the agri-food industry, and the Cancer Bio health centre, which brings together players from the health and biotechnology sector, particularly in the field of cancer. Lastly, the "Water Centre" opens up very exciting networking prospects for research laboratories and companies in this field.

In 2009, the PRES has decided to organize its global campus into 6 centres of competence, which are now described.

### ***Centre of competence: Life Sciences***

The Life Sciences centre comprises 42 laboratories (12 ranked A+ (29%) and 25 ranked A (60%) by AERES), over 1,700 permanent staff, about 1,000 postdoctoral and doctoral students. The centre has been awarded 7 silver and bronze CNRS medals, 2 nominations at the Institut Universitaire de France, 2 at the French Academy of Sciences and 2 at the Academy of Technology. Projects are in health, ecology, plant and animal agro-biosciences and biotechnology, with an even distribution between basic sciences, medically-oriented fields, and plant, animal and microbiology sciences.

Life Sciences have strong international visibility with a high level of research funding obtained via the EU but also multiple invitations as keynote international conferences and a significant contribution to the organization of major international meetings.

Valorisation activities involve cooperation with the regional Competitiveness Centres "Cancer-Bio-Health" and "AgriMip Innovations", several regional biotechnology companies



and major industrial groups (SANOFI-AVENTIS, Laboratoires Pierre Fabre, LFB, Servier, GSK, Biogemma, Syngenta, DeSangosse, AB7 Industries, RAGT, Soltis, Adisseo, L'Oréal, Michelin).

Toulouse Life Scientists developed cutting edge technological infrastructures that are ISO 9001 and IBISA certified. They are supported by the regional teams in several recently labelled National Infrastructures: F-CRIN, BioBanques, ProFI and France-Génomique.

The excellence of the life science centre was confirmed by the success of the TULIP LABEX and Toulouse White Biotechnology (TWB). For the sake of conciseness, we will not describe these projects detainedly.

The Life Sciences centre submitted 5 new LABEX projects:

- **SysABiot** merges expertise in biocatalysis, microbiology, bioinformatics, mathematical modeling and engineering sciences to develop a synthetic approach in microbiology. Goals are to define new processes exploiting microbes for applications in white biotechnology (linked with TWB and 3BCar Carnot Institute), as well as in water treatment processes and in novel antimicrobial therapeutics for combatting infectious diseases. The project groups experts from 18 scientific teams. It has already been quite positively evaluated for its scientific thrust, and will be rescaled to focus goals on specific deliverables.
- **IBSyT**. How genomic information is epigenetically modified, interpreted and translated into cells, organs and individual/collective behavior is at the core of this project involving 30 senior scientists and successful young PI from 6 UMR and ITAV. IBSyT uses animal models to decipher the dynamics of interaction and networking among genes, proteins, neurons and individuals that underlie normal and pathological development, including neurodegenerative disorders. IBSyT builds on a long tradition of sharing concepts and technologies and the creation of a new building (Plan Campus). One goal is to strengthen the rising forces in system biology and modeling of complex biological systems.
- **T-CID**. Its goal is to develop new therapeutics for chronic inflammatory diseases, the prevalence of which increases dramatically in all countries, impacting life expectancy and economy. The project is based on strong and innovative projects carried out in public-private partnership. Relying on 16 teams comprising 60 of the 160 scientists and physicians-scientists working in Toulouse on inflammatory diseases, it will be rescaled and proposed again.
- **TOUCAN** merges the best cancer experts in Toulouse on 5 essential questions in oncology to propose new therapeutic concepts and targets, through packages focused on hematological, gynecological and gastrointestinal cancers. For this goal, about 80 scientists from 18 teams from the newly created Cancer Research Center of Toulouse and surrounding labs will synergize in, and translate their findings into scientific breakthroughs, industrial R&D contracts, teaching and clinical trials at the Oncopole de Toulouse.
- **METACANUT** will address how the links between life style, food habits and obesity predispose to insulin resistance, arterial hypertension, disorders of lipid metabolism, type 2 diabetes, atherosclerosis, renal and heart failures. The main goal is to set up a highly effective structure for a complementary approach including fundamental and clinical aspects as well as thorough interactions with food and pharmaceutical companies including SMEs. It will propose new strategies for prevention, early disease detection and discovery of therapeutic approaches of metabolic and

cardiovascular diseases. It involves 15 academic research teams and the participation of industries and startups stemmed from these research teams.

All these projects are strongly interactive. New high throughput “omics” technologies render biological research increasingly tied to computer sciences, physics and mathematics. The LABEXs directed towards integrative biology (TULIP, SysABiot, IBSyT) will thus promote the “MIBS” (see Box 5) transversal initiative among biology, engineering sciences, physics, informatics and mathematics. In conjunction with TWB and the two LABEXs in economics and social sciences, they will also promote the emergence of an institute of sustainable development. Furthermore, a transversal initiative on the questions of aging and dependency will mobilize several disciplines. Using the Gerontopole, private and local public funding, the F-CRIN network will promote translational research among LABEXs. The economic evaluation of medical care vs. prevention of old age dependence, will be tackled in relation with TSE.

### ***Centre of competence: Sciences of matter***

This centre gathers 12 research units ranked A (6) or A+ (6) and 415 researchers and teachers-researchers. Their expertise in the domains of physics, chemistry, and material science enable the study, understanding and shaping of matter down to the nanometric scale. The staff has been rewarded on several occasions, including the winning of 7 silver CNRS medals and the nomination of 12 people at the Institut Universitaire de France, 3 at the Academy of Sciences, and 1 at the Academy of Technology. Note also that four ERC projects have been obtained in this pole.

Physics constitutes the basis of the « Laboratoire d'Excellence (LABEX) » NEXT which has been selected in March 2011 (among the 39 projects ranked 1<sup>st</sup>). The main initiatives of NEXT are summarized below.

Regarding Chemistry, part of it is embedded in the NEXT program, and the other part is preparing a LABEX project « MOLECULE » more focused on innovative aspects of molecular chemistry. Note that chemistry is particularly recognized by specific awards (3 Humboldt prizes, 2 Royal Society of Chemistry prizes, 3 SCF prizes in 2010,...) and the fact that three chemists from Toulouse are members of the French Academy of Sciences.

The centre has a strong activity in exploitation of research results, as shown by the presence of a Carnot Institute, the CIRIMAT (Inter-University Centre for Material Research and Engineering). It has been renewed recently and constitutes one of the two Carnot Institutes entirely located in Midi-Pyrénées. This laboratory develops materials and processes for transport, energy, electronics, information technologies, environment and healthcare, with 35 deposited patents between 2005 and 2009.

Most laboratories of the pole are partners of the Toulouse IRT project, of the RTRA « Sciences and Technologies for Aeronautics and Space », the RTRS « Cancérologie » and the « Aerospace Valley » Competitive Pôle.

The Nano, EXtreme Measurements & Theory (**NEXT**) project involves six laboratories (179 researchers) on the same campus in Toulouse, working at the frontier of knowledge in the domains of nanophysics and nanochemistry, condensed and soft matter physics, optics, and atomic/cluster physics. The mastering of many aspects of the nanoworld, involving physicists as well as chemists, from the elaboration of materials to their characterization by a whole variety of techniques, the study of matter in extreme conditions (very high magnetic field,

very low temperature, ultra-high spatial and temporal resolution...), and the interplay between experimental and theoretical approaches constitute the trademark of NEXT. NEXT plans to attract leading scientists on attractive permanent and temporary positions. In addition, NEXT intends to strongly invest in the development of the attractiveness of the local masters and the doctoral school (master scholarships, experimental training programs, links with the private sector...) and to develop ambitious initiatives in the domain of the dissemination and the valorisation of its results, and the circulation of scientific knowledge toward a wide range of public.

This centre of competence will submit another LABEX project, named **MOLECULE**. Chemistry in Toulouse gathers several hundred people (research and teach-research), but the LABEX project MOLECULE has been defined only around teams ranked A+ by the AERES, representing 49 people, and is technically supported by the active policy of equipment pooling of the Institut de Chimie de Toulouse (ICT). Three scientific themes have been defined:

- Molecules for a new chemistry: Highly reactive molecules and original concepts, opening new perspectives in particular in synthesis and catalysis.
- Molecules for nanosciences: Construction of new objects (molecules, molecular materials, nanoparticles) to develop their physical properties.
- Supra-and macro-molecules: New well-defined giant molecules (dendrimers), self-organized assemblies, polymers and nano-objects, all of them developed for their physical and biological properties.

In addition, the LABEX will provide multidisciplinary education and training in chemistry at the interface of physics and health, in order to fulfill the societal demand.

***Centre of competence: Mathematics, Information and Engineering Sciences and Technologies***

The excellence of the MST2I centre is recognized at the international level in two main areas: Mathematics & Computing as well as Engineering & System Sciences. The strong specialization of the Toulouse area in these fields is well-established as well as the good 3<sup>rd</sup> position within a national ranking as regards the fraction of A+ and A faculty members. The initial "excellence perimeter" within the IDEX project is constituted by the groups that achieved an A+ rating and that are central for the five LabEx projects proposed at the second call. They represent 500 persons (40% of the overall number of MST2I faculty members and researchers). Within this perimeter, 8 researchers have had the distinction of being appointed to the IUF; 3 got an ERC grant; 3 silver and 7 bronze CNRS medals were awarded in recent times. Five researchers are currently members of the Académie des Technologies.

**In the area of mathematics & computing**, the Institut de Mathématiques de Toulouse –IMT and the Institut de Recherche en Informatique de Toulouse –IRIT joined their potential in the LABEX project CIMI (International Centre of Mathematics and Computer Science in Toulouse). Mathematics & Computing have to face the ever increasing amount of data and complexity of new models arising in scientific areas such as economy, biology, medicine, social science, fluid mechanics and climate prediction. A tight collaboration between mathematics and computer science is therefore inescapable. IMT has a recognized strong expertise in geometry, analysis, partial differential equations, probability and statistics. IRIT has on its side a strong expertise in algorithmics for image and multimedia, multi-agent systems, numerical optimization, and information representation and processing.

**In the area of engineering sciences**, the Institut de Mécanique des Fluides –IMFT, the Laboratoire Plasma et Conversion d’Energie –LAPLACE, the Laboratoire de Genie Chimique –LGC and the Office National d’Etudes et de Recherches Aérospatiales -ONERA integrate their expertise in the LabEx project PHELLOWS (Physics and Engineering of Multiphase and Plasmas Flows) centered on the physics and engineering of “Low Temperature Plasmas in the context of aeronautics and space applications” and “Multiphase flows: from micro-physics to large systems”. PHELLOWS’s ambitions are to solidify and consolidate existing excellence in these areas and to encourage and support research in the basic physics and science at the interface between the two thematic areas.

**In the area of sciences and technology for information and communication**, Laboratoire d’Analyse et d’Architecture des Systèmes -LAAS-CNRS, IRIT and ONERA (main partners) have joined their efforts to propose the LabEx ORCHESTRA (Open Resilient Cyber-physical Human-aware systems: from Embedded Sensors & actuators To adaptive autonomous Robots and Ambient services). The research program spans from theoretical foundations, through design, implementation and assessment, to real-world application scenarios, as well as teaching and training. Research will focus on critical enabling technologies and basic building blocks (including smart sensors, networking protocols, computing and decision algorithms, software services, advanced autonomous robots, etc.) for developing systems that bridge the gap between the Cyber, Physical, and Social worlds.

**At the crossroad of micro / nano technologies and biology**, the BioTed (Bio Integrated Technologies) LabEx project gathers LAAS-CNRS, Institut de Pharmacologie et de Biologie Structurale -IPBS, Institut des Technologies Avancées en sciences du vivant -ITAV and laboratoire des Interactions Moléculaires et Réactivité Chimique et Photochimique -IMRCP, around the objective to develop the next technological building blocks, which will drive future applications in NanoBioTechnologies. It anticipates that the future generation of systems will incorporate, at the level of individual components, biological species, either molecular or cellular, and electrical, mechanical or optical devices manufactured by modern nanofabrication techniques. The work program proposes two main streams, referred to as “nanotechnologies for biology” and “nanotechnologies from biology”.

**In the area of engineering**, ONERA, IMFT, LAAS/CNRS, ISAE, ENAC, ICA (Institut Clément Ader) plan to regroup in a single lab, specialists from different scientific domains in order to imagine certification means in each scientific domain as well as foster new cooperation between these domains on specific certification objectives. The LabEx CERTIF will anticipate certification solutions but also be proactive in the evolution of certification standards. The LabEx is organized in three scientific domains: Mechanics, Systems and Physics. Research themes in Mechanics include icing, fire protection, buffeting, acoustics, and propulsion. Research themes in Systems include dependability, systems engineering, embedded architectures, electrical engineering, interactive systems, control theory. Research themes in Physics include electromagnetic compatibility, radiation effects on electronics.

***Centre of competence: Universe, Planet, Environment, Space***

The Toulouse research pole ‘Sciences of the Universe, Space and Environment’ represents one of the largest concentrations of research potential in this field in France. In terms of indicators, it presents the highest productivity index (per field) in the Midi-Pyrénées area. It brings together 1,200 people, among which 490 researchers or academics and 480 engineers and technicians. Seven research laboratories are gathered in the Midi-Pyrénées Observatory and two research laboratories belong to the Toulouse “Météopôle”. This Pole also includes

research structures such as the French Aerospace Lab (ONERA) and the "Space and Aeronautics Higher Institute" (ISAE). 6 laboratories have been ranked at the highest level (A+) and 3 at the very good level (A) by the French National Evaluating Agency (AERES) in 2010. The research center is supported by the Paul Sabatier University, The Institut National Polytechnique de Toulouse, the National Institute 'Sciences of the Universe' of CNRS (INSU), the National Institute 'Ecology and Environment' of CNRS (INEE), the Institute for Development Research (IRD), the French National Space Agency (CNES), MétéoFrance and the foundation 'Thematic network of advanced research: science and technology for aeronautics and space' (RTRA STAE).

In the field of universe science, publications in meteorology, astronomy, geosciences and geochemistry-geophysics represent respectively 25%, 12%, 10.5% et 11% of national production, allowing a clear identification of the leading fields.

**International:** Structuring international research is essential and constitutive of the Earth and Universe Science research fields. Research actors of the Pole are recognized as scientific leaders in their research domains with high visibility at the international level: more than 20 international projects are developed and coordinated by scientists of the Pole and many other scientists are highly involved in international programs, with 69 identified partnerships (mostly outside Europe) in 27 countries. Among these partnerships, 9 Mixed Research Units and Research Groupings of CNRS and the Institute for Development Research (IRD) are identified. Researchers of the Pole are also actively involved in international structures like GMES (Global Monitoring for Environment and Security). 75% of publications are published with European or international co-authors'.

**Exploitation and technology transfer:** Research partnership with industry is highly developed in some of the pole activities in the fields of water and space. There is a strong link with the Institute of Research and Technology (IRT) and the Space industries Astrium and Thales Alenia Space. The research Pole is an active member of the worldwide competitiveness pole 'Aeronautic, Space, on-board Systems', (AESE) and of the world cluster 'Pole Eau (ie water cluster)'. This strong activity in technology transfer and valorisation is reinforced by the presence of one Carnot Institute within the pole (ONERA ISA) which participates to the conception of aerospace platforms and one with Pau University for the creation of an Institute for the Sustainable Engineering of Fossil Resources

**Instrumental and experimental platforms:** The Centre includes several instrumental and experimental platforms which are unique in Europe (e.g. the French centre for airborne research facilities, ground atmospheric observatories, an experimental hydraulic system, the astronomical and atmospheric observatory at the Pic du Midi).

**LABEX SEAS (Space and Earth System):** The scientific research in astrophysics, planetary science and environmental studies of the Earth has major objectives for the coming years, such as: (1) the understanding of the formation and evolution of the universe, from the first galaxies to the planetary systems. (2) the understanding and the modeling of the global-scale evolution of our own planet, and the interactions within and between the main solid and fluid reservoirs; (3) the analysis of the interplay between man and the behavior of the Earth-system, not only in terms of the impact of human activity on the environment (health, resources, etc.), but also the environmental constraints on man and on social systems.

The LABEX SEAS project (Space and Earth System) which was submitted was evaluated very positively as concerns to the education and science. This project aims at promoting

interdisciplinary scientific challenges that relies on challenging methodologies. They are based on the well recognized strength of Toulouse research activity in a) modeling, b) use of space techniques, c) capacity for developing instrumental and laboratory experimentation. The project is also promoting a new scientific research domain concerning environmental health and society which was recognized for its competence. The LABEX SEAS project involves 250 scientists in the centre of competence, including 150 from national research institutions (CNRS, IRD, CNES, Meteo France) and 100 from University.

***Centre of competence: Heritage, Apprenticeship, Creation, Society***

There are 634 publishing scientists within PACS in SHS and ALL, with 91% in the 4 A units and 11 A units of Université de Toulouse Le Mirail. On a national scale, Toulouse and the Midi-Pyrenees region are a major hub of scientific publication in social and human sciences (6% and 7% of French publishing scientists in research units graded A+/A respectively, 4<sup>th</sup> and 3<sup>rd</sup> national ranks). In the fields “spaces, the environment and societies”, “human nature, language, education” and “languages, texts, art and culture”, this hub ranks 3<sup>rd</sup> in the country (source: STRATER). Since 2001, it has accumulated 6 CNRS medals (5 bronze and 1 silver), 12 IUF members, on average 5 PCRD programmes and 10 new ANR programmes a year. Its activities are characterised by strong research internationalisation in fieldwork based research in a number of disciplines; by a strong momentum towards offering a broad and diversified range of masters (26 specialisms) and PhDs (40 specialisms); by the development of platforms combining scientific work, training and research valorisation; by strong involvement in city life, the development of culture and contribution to public debate. This centre of competence is submitting 4 LABEX projects.

**LABEX "Pôle ArchéoScience Toulouse"** (PAST): PAST brings together all those in the region involved in the study of past societies (archaeology, history, architecture, anthropology, life and earth sciences, ecology, science of materials, IT; UT2, UT3, Ecole d'architecture de Toulouse, Service régional de l'Archéologie, Institut national de recherches en archéologie préventive, Toulouse municipal museums and archives, Service de l'Inventaire de la Région Midi-Pyrénées). PAST includes 119 researchers and lecturers 5 laboratories graded A+ and 4 graded A (TRACES, FRAMESPA, GEODE and PLH for UT2, AMIS, CEMES, CIRIMAT, GET and IRIT for UT3). Focusing on three themes (Mankind: population dynamics and man-environment interactions; Creating space: constructing landscapes, territories, habitats; From material to object: techniques and procedures, distribution, conservation), PAST encompasses the full chain from fundamental research to conservation, to the management and promotion of archaeological heritage.

**LABEX "Research and Action in Philosophy, Art and Literature"** (RAPAL): RAPAL links the ERRAPHIS laboratory (philosophy, project coordinator, A+) to two Literature and Art laboratories: LLA-CREATIS (A) and PLH (A). Its ambition is to demonstrate the importance and vital nature of the Humanities as a factor in social change and cultural creation. It organises all the initiatives through which the skill of its researchers lays the foundation for action at the service of society, in the shape of applied action, contextual interaction, critical intervention, the creation of form and even “action research” in the specific sense of the term. RAPAL is involved with a series of cultural establishments (theatres, museums, film archives, foundations) of national and regional importance and is in contact with a wider network of associations and entrepreneurs. Its project actively contributes to the development of the cultural Euro-region Pyrenees-Mediterranean.

**LABEX “Cognitive Utility Laboratory in Toulouse” (CULT):** CULT is a consortium of psychologists, neuroscientists and linguists performing fundamental research work guided by the social/economic utility of higher mental function. CULT is based on three units with experience of industrial and social partnerships, as well as collaboration between SDV-SHS-STIC: CLLE (CNRS-UT2, A+), OCTOGONE (UT2, A) and CERCO (CNRS-UT3, A+). CULT is aiming towards strategic guidance of cognitive research targeted social and economic utility, which gives this research a fundamental role up to the standard of its applied impact. LABEX organization provides for an interdisciplinary approach and controlled risk-taking in the choice of research in a way that simply responding to industrial or social demand does not. The aim of taking these strategic and multidisciplinary risks is to accelerate innovative breakthroughs in the targeted study of cognition.

**LABEX “Structuring the Social World” (SMS):** SMS gathers researchers from 4 PACS A/A+ units (LISST, FRAMESPA, CERTOP, Rural Dynamics), from LASSP (political science), IRIT (IT), LEREPS (economics), IMT (mathematics) and INRA-AGIR, exploring the evolving yet lasting collective and institutional patterns that structure social activity. These researchers are experts in the analysis of social networks and collectives, social regulations and territories. SMS closely combines analytical and modelling methods from quantitative sciences and SHS survey work. While carrying out very broad research (survey on the evolution of social networks in a context of Internet socialising tools, recoding and analysis of bibliographical databases -Web of science and Scopus- in order to study scientific activity networks and geography), SMS is aiming to develop a theoretical and methodological framework enunciating the different structural patterns of the social world, and to produce a vision of the social world that could counterbalance the various forms of reductionism.

***Centre of competence: Economics and Social Sciences***

This centre represents the highest domestic concentration of leading researchers in the aforementioned fields (economics, law, political sciences and management sciences). Using the AERES evaluation, this centre is structured into 10 research laboratories, five ranked A+ and five ranked A, all within UT-Capitole. It contains a Law School, a School of Management (IAE) and the RTRA “Toulouse School of Economics” (TSE), which interacts with several research teams in Toulouse, in particular in mathematics, ecology and health sciences.

This centre has submitted two LABEX projects. The **“Institute of Advanced Studies in Toulouse” (IAST)** is an interdisciplinary research centre in the Social Sciences. It will be a place of exchange across fields: those at the heart of the project (Law, Sociology, Psychology, Political Science, Management Sciences, Economics) and also, depending on opportunities and synergies with the project, other disciplines (Quantitative History, Demography, Political Philosophy, Human Ecology, Mathematics, Anthropology and Cognitive Sciences).

**The other LABEX (IAM TSE)** project is structured around the reinforcement of the long-term TSE project. TSE is now ranked 11th economics department in the world by the University of Connecticut ranking (RePEc). Most if not all existing rankings evaluate TSE as the best economics department in Continental Europe. The excellence of this centre is also visible in its 13 IUF and 8 ERC grants, in its connection with the industry (more than 40 large-scale private partnerships over the last 10 years) and in its internationalism (6 senior recruitments from the best universities in the world since 2009 (NYU, UCLA, Oxford,...), 8 junior recruitments in a new tenure track system since 2010 (from MIT, Stanford, Yale, Columbia, Northwestern,...), and a graduate school in which 80% of students are from overseas).

**5.2.2 APPLICATION TO THE ACTIONS OF THE PROGRAMME « INVESTISSEMENTS D'AVENIR »**
**1) Selected laboratories of excellence**

<i>Project acronym</i>	<i>Field</i>	<i>Name of the project manager</i>	<i>Project leader</i>	<i>Consortium/ involved partnership</i>
<b>Labelled LABEXes in Toulouse</b>				
TULIP	SVSE	Dominique ROBY / Etienne DANCHIN	PRES Université de Toulouse	Université Paul Sabatier, INPT, INRA, CNRS, ENFA
NEXT	SIMI	Xavier MARIE	PRES Université de Toulouse	Université Paul Sabatier, INSA de Toulouse, CNRS
IAST	SHS	Jean TIROLE	Université Toulouse 1 Capitole	IEP, CNRS, INRA, EHESS
<b>Labelled LABEXes in networks with a local node</b>				
STORE-EX	SIMI	Jean-Marie TARASCON	CNRS	Université Paul Sabatier, Université de Montpellier 2, Université Picardie Jules Verne, Université de Nantes, Université de Provence, Université de Pau et des Pays de l'Adour.
CEBA	SVSE	Jérôme CHAVE	Université des Antilles et de la Guyane	Université Paul Sabatier, Université de Montpellier 2, AgroParisTech, CNRS, INRA, IRD, CIRAD, Institut Pasteur
SOLSTICE	SIMI	Gilles FLAMANT	Université de Perpignan Via Domitia	ENSTIMAC, Université de Montpellier 2, CNRS

**2) Laboratories of excellence presented in the IDEX project, to be submitted to the second Labex call**

<i>Project acronym</i>	<i>Field</i>	<i>Name of the project manager</i>	<i>Project leader</i>	<i>Consortium/ implicated partnership</i>
MOLECULE	SIMI	Azzedine BOUSSEKSOU	PRES Université de Toulouse	Université Paul Sabatier, CNRS



SEAS	SVSE	Pierre SOLER	PRES Université de Toulouse	Université Paul Sabatier, INPT, IRD, CNRS, CNES, METEO-France, CERFACS
CIMI	SIMI	Michel LEDOUX	PRES Université de Toulouse	Université Toulouse_1 Capitole, Université Toulouse II Le Mirail, Université Paul Sabatier, INPT, INSA de Toulouse, INRA, CNRS
IAM-TSE	SHS	Christian GOLLIER	Fondation Jean- Jacques Laffont	Université Toulouse_1 Capitole, INRA, CNRS, EHESS
SysABiot	SVSE	Nic LINDLEY	PRES Université de Toulouse	Université Paul Sabatier, INSA de Toulouse, CNRS, INRA,
IBSyT	SVSE	Alain VINCENT	PRES Université de Toulouse	Université Paul Sabatier, CNRS, INSERM
T-CID	SVSE	Roland LIBLAU	PRES Université de Toulouse	Université Paul Sabatier, CNRS, INSERM, SANOFI, Institut de Recherche Pierre Fabre, LFB Biotechnologies, MilleGen, Cayla-InvivoGen, Ambiotis, UROsphere, INRA, ENVT
TOUCAN	SVSE	Jean-Jacques FOURNIE Pierre BROUSSE	PRES Université de Toulouse	Université Paul Sabatier, CNRS, INSERM
PAST	SHS	Pierre MORET	PRES Université de Toulouse	Université Toulouse II Le Mirail, Université Paul Sabatier, EHESS, Ecole Nationale Supérieure d'Architecture de Toulouse, CNRS, Ministère de la Culture – Sous-direction de l'Archéologie, INRAP, Mairie de Toulouse, Conseil Régional Midi-Pyrénées, IRD
CULT	SHS	Jean-François BONNEFON	PRES Université de Toulouse	Université Toulouse II Le Mirail, Université Paul Sabatier, CNRS.
SMS	SHS	Michel GROSSETTI	PRES Université de Toulouse	Université Toulouse II Le Mirail, Université Toulouse_1 Capitole, Université Paul Sabatier, INPT, INSA de Toulouse, EHESS, CNRS, INRA

CERTIF	MST2I	Bernard LECUSSAN	ONERA	LAAS-CNRS, ISAE, ENAC, Université Paul Sabatier, INPT, INSA
PHELLOWS	MST2I	Pierre AIMAR	PRES Université de Toulouse	CNRS, UPS, INPT, INSAT, ONERA, ISAE, EMAC, INRA
ORCHESTRA	MST2I	Jean ARLAT	PRES Université de Toulouse	LAAS-IRIT-ONERA-MSHST USR 3414 (LISST - UMR 5193, LEREPS - EA 4212)- IFR MNJ (IDETCOM - EA 785, IMH - EA 786, EPITOU - EA 780)
BIOTED	SDV	Christophe VIEU	CNRS DR14	LAAS-CNRS, IPBS UPS CNRS UMR5089, ITAV CNRS UPS INSA UMS3039, IMRCP UPS CNRS UMR5623
LASTENDO	SDV	Jean-François ARNAL	PRES Université de Toulouse	I2MC INSERM U1048, CPTP INSERM U 1043, CDPA INSERM U1027, LHIPE UMRS 608 Marseille, PDEM INSERM U644 Rouen, IPBS CNRS UMR5089 Toulouse
REHMA	PACS	Jean-Christophe GODDARD	PRES Université de Toulouse	Equipe de Recherche sur les Rationalités Philosophiques et les Savoirs EA3051, Patrimoine, Littérature, Histoire EA4601, Lettres Langages et Arts EA4152, Cultures Anglo-Saxonnes EA801, Centre d'Anthropologie sociale UMR5193

### 3) Innovative training projects to be submitted to the Idefi call for proposals

<i>Project acronym</i>	<i>Name of the project manager</i>	<i>Project leader</i>	<i>Consortium/ implicated partnership</i>
EDT	Monique MARTINEZ	PRES Université de Toulouse	UT1 Capitole, UT2 Le Mirail, UT3 Paul Sabatier, INSAT, INPT, ISAE, EMAC
FORMADIPE	Marc BRU	PRES Université de Toulouse	<u>UT2-IUFM</u> , CNED, CNDP
DEFIAL	Marie-Hélène GARELLI	PRES Université de Toulouse	<u>UT2 Le Mirail</u> , UT3 Paul Sabatier

e-DEFI Santé	Bernard RIGAUD Pierre LAGARRIGUE	PRES Université de Toulouse	<u>CUFR JF Champollion</u> , UT3 Paul Sabatier, Institut Polytechnique Bordeaux
DECCAÉ	Hugues KENFACK	PRES Université de Toulouse	<u>UT1 Capitole</u> , IEP Toulouse, St Louis University School of Law (USA)
CAPITOLE	Claude MARANGES	PRES Université de Toulouse	<u>INSAT</u> , INPT, ISAE, EMAC
FINMINA	Marc RESPAUD	PRES Université de Toulouse	<u>INSAT</u> , UT3 Paul Sabatier, INPT, les pôles CNFM et Universités Associées
FREDD	Marie-Françoise CALMETTE	PRES Université de Toulouse	<u>UT1 Capitole</u>
PEC-formation OFTLV	Jean-Pierre FAUDE	UT3 Paul Sabatier	<u>UT3 Paul Sabatier</u> , UT1 Capitole, UT2 Le Mirail, CUFR JF Champollion, réseau des 21 autres universités françaises
InnovENT-E	Jean Louis BILLOËT	INSA de Rouen	réseau des INSA, réseau des UT, CESI, Université de Lorraine
L'Open MIAGE	Ahmed BOUNEKAR	Université de Lyon 1	UT1 Capitole, UT3 Paul Sabatier, 5 autres universités portant les formations e-MIAGE
FIGURE	Rodolphe VAUZELLE	Université de Poitiers	UT3 Paul Sabatier, réseau de 11 autres universités

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

<i>Call for proposal</i>	<i>Project acronym</i>	<i>Name of the project manager</i>	<i>Project leader</i>	<i>Consortium/ involved partnership</i>
EQUIPEX	MIMETIS	Etienne SNOECK	CNRS (CEMES)	Université Paul Sabatier
EQUIPEX	ROBOTEX	Michel de MATHELIN	CNRS (INSIS)	INRIA, Laboratoire d'informatique de robotique et de microélectronique de Montpellier (LIRMM), Universités de Grenoble, Montpellier II, Poitiers, Strasbourg, Rennes, Franche-Comté, Nice, Marseille, Paris6, Cergy-Pontoise, Université de Technologie de Compiègne, Ecole Centrale Nantes, Ecole des Mines de Nantes
EQUIPEX	EQUIP@MESO	Catherine Le LOUARN	GENCI	Université de Strasbourg, universités Joseph Fourier de Grenoble, Claude Bernard de Lyon, Pierre et Marie Curie, Universités de Provence, de Reims - Champagne - Ardenne (URCA), PRES Paris-Sciences et Lettres, PRES Université de Toulouse, CEA, Centre de ressources informatiques de

				Haute-Normandie (CRIHN)
EQUIPEX	XYLOFOREST	Jean-Michel CARNUS	INRA	Universités de Bordeaux I, Pau et Pays de l'Adour (UPPA), INSA de Toulouse, Centre de coopération internationale en recherche agronomique pour le développement (CIRAD), Institut technique du bois, Ecole Supérieure du Bois, Institut technologique Forêt cellulose bois-construction ameublement (FCBA)
IRT	AESE	Jean-Marc THOMAS	PRES, TOMPASSE	Around 20 academic partners and 30 industrial partners
Démonst. en biotech.	TWB	Pierre MONSAN	INRA	INSA de Toulouse, CNRS
Biotech et Bio- ressources	SYNTHACS	Jean-Marie FRANCOIS	INRA	INSA de Toulouse, CNRS, Adisseo
Infrastr. en bio. et santé	ProFi	Jérôme GARIN	CNRS	Université Paul Sabatier, Université Joseph Fournier, Université de Strasbourg, CNRS, INRA, CEA, ...
Infrastr. en bio. et santé	FRANCE- GENOMIQUE		CEA	CNRS, INRA, INSERM
Infrastr. en bio et santé	BIOBANQUES	Georges DAGHER	INSERM	70 Centres de Ressources Biologiques (CRB) répartis sur le territoire
Infrastr. en bio et santé	F-CRIN	Olivier RASCOL / Claire LEVY MARCHAL/ Norbert IFRAH	INSERM	Les 54 Centres d'Investigation Clinique (CIB) nationaux

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

<i>Call for proposal</i>	<i>Project acronym</i>	<i>Name of the project manager</i>	<i>Project leader</i>	<i>Consortium/ implicated partnership</i>
EQUIPEX 2	ALOHA	Fati NOURASHEMI	CHU	CHU, IRIT, LASS
EQUIPEX 2	ANINFIMIP	Eric OSWALD	PRES	IPBS, CPT, LIHA, Anexplo-Creffe
EQUIPEX 2	ARCHEODRONES	Florent HAUTEFEUILLE	PRES	TRACES, GET, GEODE, IRIT, LAAS, ISAE, ONERA
EQUIPEX 2	BIM	Pascal SWIDER	PRES	IMFT, IPBS, IMT, CHU
EQUIPEX 2	RESIF-CORE	Helle PEDERSEN	CNRS	OMP, Géoscience-Environnement
EQUIPEX 2	TPP	Jacques BATUT	PRES	AIB, LIPM, LRSV, EDB, GBF, CNRGV, SEEM
EQUIPEX 2	TENGO-PIC	Catherine JEANDEL	PRES	GET, LA, ECOLAB, LCA
EQUIPEX 2	TIP	Thierry LEBEY	PRES	LAPLACE, LAAS, IRIT, IMFT, CIRIMAT
EQUIPEX 2	UBIVERTEX	Christian PEREZ	INRIA	IRIT
EQUIPEX 2	BATAC	Pierre MILLAN	ONERA	DMAE, IMFT
EQUIPEX 2	COSMOS	Christine JOBLIN	Univ Caen	OMP
EQUIPEX 2	OPS	Yves du PENHOAT	INSU	OMP
EQUIPEX 2	LEAF	Emmanuel DUBOIS	CNRS - IEMN	LAAS
EQUIPEX 2	LIDAR	Philippe BOURGEAULT	Météo France	CNRM, OMP
EQUIPEX 2	NAVCENTER	Abdellatif OUAHSINE	UT-Compiègne	UTC, CETMEF, IMFT

### 5.2.3 EXCELLENCE PERIMETER, ENVIRONMENT, PROSPECTS AND ADDED VALUE

#### **Current strength**

Midi-Pyrénées is the leading French region in terms of relative research effort, with 16.2 researchers for every 1,000 salaried positions. According to OST, researchers in Toulouse produce 7.5% of national publications, and at least 25% of them belong to the world top10% in their field. Out of the ten disciplines assessed by AERES (Maths, Physics, Chemistry, etc.), the Toulouse campus is ranks 2<sup>nd</sup> to 5<sup>th</sup> place in terms of the number of producers in bodies rated A or A+, with strong specialisation in Sciences of the Universe, for which the region represents 8.6% of the scientific output in France (ranking 2<sup>nd</sup> nationally), followed by Engineering Sciences (ranking 3<sup>rd</sup> nationally). Apart from this traditional area of specialisation in hard sciences, the campus also holds top positions in various fields of social sciences and humanities.

Another method for assessing the relative quality of research in Toulouse compared to the rest of France consists in counting the number of CNRS medals, the number of ERC Grants, or the number of awards from the Institut Universitaire de France (IUF). The list of CNRS medalists in Toulouse since 1997 reads as follows: 1 gold medal, 12 silver medals and 35 bronze medals. Toulouse has also 13 ERC Grants, and 36 active IUF members.

The Shanghai classification is favourable neither to Toulouse nor to France in general. In fact, only three French universities are ranked in the top 100 of the 2011 ARWU classification and the first listed university in Toulouse, Paul Sabatier University, ranks 201<sup>st</sup> – 300<sup>d</sup>. Please note that Toulouse is the only French city with Paris to have as many as four fields of excellence (biology, mathematics, physics and economics), according to the recent ranking of European Universities established by the Centre for Higher Education Development in Germany.

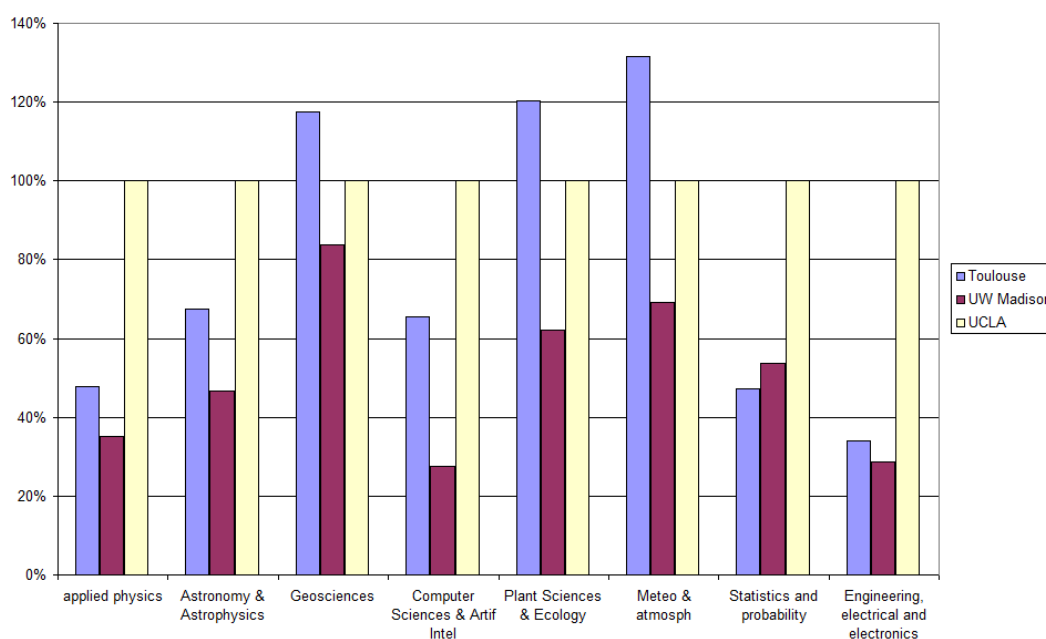


Table: Citation index in 2010 for papers published since 2005.  
(Source: Thomson-Reuters and own computation)

UT's perimeter of excellence UT\* has the ambition to attain a degree of international prestige similar to the University of California at Los Angeles and the University of Wisconsin at Madison. In order to evaluate our scientific performance in comparison with these benchmark universities, we asked Thomson Reuters (TR) to compare our citation index with these two universities in a sample of fields: Applied physics, astronomy and astrophysics, geosciences, computer sciences, ecology, meteorology, statistics, and engineering. This index measures the number of citations obtained in 2010 for papers published since 2005 by authors in UT, and in our benchmarks, the University of Wisconsin at Madison, and the University of California at Los Angeles. The index from the latter institution is normalized to 100.

UT will rapidly develop its own expertise in the quantification of scientific productivity through the creation of the internal Observatory of Performances and the external Group of Scientific Evaluation. This effort will be used to refine the perimeter of excellence. In order to initiate this transformation and to help the GSE in its initial evaluation task, the PRES of Toulouse identified its scientific leaders in 22 different disciplines. With the assistance of Thomson Reuters (TR), the PRES of Toulouse established the list of its researchers in the top 10% best researchers worldwide in their discipline. This has been done by counting the number of citations during period 2001-11 for papers published during the same period (in order to limit the seniority effect). It used the Essential Science Indicators (ESI) journal category and the Web of Science. The following Table provides the number of UT's researchers who belong to that elite category for each of these 22 disciplines, together with the threshold cumulated citation number for the first decile.

Fields	# of researchers in the top 10%	# of citations to belong to the top 10%	Proportion of missing adresses	# of identified UT researchers in the top 10%
Agricultural Sciences	29393	50	35%	48
Biology & Biochemistry	75493	145	27%	121
Chemistry	78773	145	18%	221
Clinical Medicine	188181	203	22%	248
Computer Science	25033	28	37%	16
Economics & Business	12408	44	32%	19
Engineering	72056	49	27%	145
Environment/Ecology	36068	79	26%	42
Geosciences	25819	110	18%	195
Immunology	25967	142	32%	47
Materials Science	39245	77	22%	89
Mathematics	12393	39	25%	48
Microbiology	29097	114	31%	62
Molecular Biology & Genetics	49745	206	27%	70
Multidisciplinary	4393	38	53%	4
Neuroscience & Behavior	38930	179	24%	38
Pharmacology & Toxicology	32307	75	35%	35
Physics	54158	194	16%	79
Plant & Animal Science	56687	76	24%	98
Psychiatry/Psychology	26690	88	33%	10
Social Sciences, general	46274	32	41%	12
Space Science	9053	367	13%	60

Table: Number of UT researchers belonging to the best 10% researchers in their field  
(Source: Thomson Reuters)

It is noteworthy that TR has identified **1,707 UT researchers (over a community of 7,100) who belong to the world top 10%, i.e., almost ¼ of the community.** However, TR has not been able to identify the affiliation of a relatively large fraction of researchers. The PRES is currently undertaking an important search effort to identify local researchers in the top10% TR list. For example, in Economics & Business, TR has been able to identify 19 UT members in the top 10%, but a search based on the list of UT members allowed the PRES to identify 41 UT members in the top 10% in that field.

***The definition of the perimeter of excellence UT\****

UT will concentrate 80% of the IDEX funds on UT\*. This perimeter of excellence, whose benchmark will be the top-20 league in each field, will also benefit from a massive reallocation of means by each college towards its research teams that belong to UT\*. Research teams labeled UT\* will thus receive recurrent funding from UT and its colleges; funding will be based on scientific production and prestige rather than on the size of the team. This funding will not become a vested right: the excellence of labeled research teams will be periodically assessed, and UT's mission in this area will include the delabeling of marginal teams and labeling of new and more dynamic ones. UT will thereby become a "tool to manufacture new LABEXes".

This perimeter will be defined as follows. The initial perimeter of excellence is limited to the research units that belong to a selected LABEX in Toulouse in the two national LABEX selection waves. In 2012, UT's research director will work with the GSE to define criteria (international ranking of team, per capita publications weighted by the quality of journals, IUF and ERC grants, whatever is deemed relevant) to assess teams. UT will then progressively label new teams. The size of a "research team" is not constrained a priori and UT will have entire leeway in this matter. It is expected though that selected research teams will be small (5-20 researchers) because the size of research groups in most (but not all) fields in top universities in the world is usually small. In France, small high-standard research teams often have difficulties emerging inside large organizational structures. Yet, it is essential that high-standards academic entrepreneurs be given a chance to create tomorrow's LABEXes. Applications to UT\* will not be project-based. Rather, teams will demonstrate existing research capabilities, recent efforts to improve their level and a strategy for further improvement. Moreover, selected research teams in UT\* will be trusted to allocate their budget as they wish (the flexibility naturally goes hand in hand with a rigorous ex post evaluation). Money that can be flexibly allocated is not yet common practice in the French academic world; this trust-based approach will increase the teams reactivity.

The UT\* label will also be conferred to educational programmes of excellence, under the supervision of the GSE. The demanding label UT\* will serve as a signal to students (from France and overseas) and to potential employers alike. UT is also committed to encourage its best researchers to share their knowledge with undergraduate students. Here are some of the elements taken into account: selectivity, class size, professors' office hours, on-line student evaluations, bilingual courses, exchange programmes with prestigious universities...

The long-term objective of this process is to create a virtual campus of excellence UT\* within the University of Toulouse whose size and international recognition resemble the ones of our benchmarks, UCLA and UW-Madison.



## 5.3. PROJECT AND PROSPECTS

### 5.3.1 UT PACT

The Pact aims at progressively instilling good practices within the entire campus, and not only within the perimeter of excellence UT\*. Each college of UT commits to abide by the Pact described in the submitted document. Accordingly, the latter will be included as a preamble in the statutory decree for each institution homed within UT.

#### ***Curbing inbreeding for assistant professors***

Local hiring at the junior level has long plagued the French academic landscape. It hurts departments, by depriving them of new talent and by dividing faculty, as well as young scholars, who fail to develop new expertise and acquire autonomy vis-à-vis their advisors; ultimately, it reduces the university's overall attractiveness. At the senior level, the law mandating an equality of treatment between internal and external candidates is often violated in France as internal candidates are selected over more deserving external ones. The UT project pioneers in that context by offering to gradually put a halt on these practices. It does so through both college adherence to the Pact and specific incentives.

By signing the Pact, colleges commit to progressively reduce inbreeding at the junior level. The target for 2018 (100% outbreeding) is meant to convey a strong message about intolerance to inbreeding. Rare exceptions can be granted by UT and only on the basis of a well-argued necessity and after a strict evaluation procedure according to international standards. The 3-year target is to reduce inbreeding in each field by 50%.

Members are committed to promote mobility. They will facilitate and encourage assistant professors to spend a year in a top research environment abroad within their first five years in Toulouse. Accordingly, sabbaticals will be granted in priority to the most promising young researchers whose host institution is leading in their field and is located abroad.

#### ***Curbing inbreeding on EPST positions as well***

The EPSTs are usually less prone to inbreeding than universities, but they do not prohibit it. In the case of junior hirings (chargés de recherche ...) made in collaboration with national research institutions (CNRS, INRA, INSERM, IRD...), a strong signal will be sent by UT that inbreeding is not desirable. A proviso to this effect is also part of the Pact signed by the colleges. UT's research units will refrain from "expressing interest" for internal candidates.

#### ***Guaranteeing merit-based hiring of professors***

UT will innovate in the French academic landscape by actively promoting the international standard of merit-based hiring of professors, with no discrimination against outsiders. Criteria for promotions and external appointments will be made transparent to UT's community as well as to the outside. Providing newly recruited assistant professors with clear standards and a vision of what is expected from them for promotion to a professorship will facilitate a promotion process mimicking international standards. And, while the law mandates a de jure equality of treatment between internal and external candidates, UT will create a de facto level-playing field. UT colleges commit to freeze faculty positions for fields that do not abide by the spirit of a level-playing field and that do not encourage talented outside researchers to apply to opening positions.

***Promoting a tenure-track process***

The international standard of a tenure-track system is still the exception in France. UT's pool of young talents could benefit from some resort to tenure-track policies without compromising its ability to recruit: The best PhDs rarely object to taking a tenure-track position as they know that they will either receive tenure or, if not, have interesting opportunities outside. UT will innovate in this direction too. First, as explained below, the IDEX funding will finance a full-fledged tenure-track system for junior chairs. UT\*'s junior chair programme creates once-renewable three-year positions, with mid-term review and, after six years, merit-based promotion using comparative outside letters. Second UT will nurture a tenure-track system at the UT level (see section 5.6). Adherence to a tenure-track policy will be entirely voluntary within UT. However, UT will be able, if it wishes so, to include adherence to the tenure-track policy as one of the criteria that are considered when labeling and de-labeling UT\* research teams.

***Efficient allocation of positions***

All too often in the French higher education context, positions are viewed as vested rights, de facto "belonging" to a laboratory or disciplinary field. Furthermore, reinforcing weak fields simply through additional recruitments or depriving successful ones of new recruitments is unacceptable policy. UT's colleges commit to exercise flexibility in the redeployment of positions, to take a long-run perspective and to privilege excellence. The opening of positions will therefore be based on the field's quality of past recruitments and on the attractiveness of the research units (together with long-term teaching needs and other relevant criteria). This broad principle will apply across the board within each college. In the particular case of research units evaluated C (or the equivalent) in the latest AERES assessment, no new position will be opened within those units. If poor performance affects the entire field, UT must come up with a plan to radically transform the research profile of the field before opening any position and must entirely control the recruitment process until discernible progress is achieved. For research units rated B, substantial caution will be exerted before opening a position, and such opening will be preceded by the submission by the unit of a detailed project outlining its future recruitment strategy. If necessary, the GSE and the Observatory of Performances will refine AERES evaluations.

It is good practice not to fill a position if a better candidate might emerge in a year or a couple of years down the road, and UT adheres to this policy. Selection committees will be made aware of this policy by UT's representative on the committee. Furthermore, colleges commit not to penalize a virtuous field by re-allocating positions away from the field when a position is left unfilled with the purpose of improving the quality of the recruitment.

***"Primes d'Excellence Scientifique (PES)"***

French universities award research-based bonuses (PES) to their best researchers. Upon incorporation of UT, the latter will administer the PES on behalf of the colleges. It will make sure that colleges have an incentive to keep a sufficient amount of PES in their budget. To this purpose, UT will ensure that the money allocated by a college goes to the college's researchers.

***Coordination in hiring***

The control of recruitments in French universities is (like elsewhere) a delicate issue. The mechanism defined below aims at making two legitimate goals consistent: local initiative

and hosting of new junior and senior faculty, and central control over the quality of recruitment. It is inspired by the practice of top universities, in which initiative mostly lies at the department level while the top administration has the ability to prevent mediocre appointments. Thus the mission of UT will be to stop, as many times as needed, recruitments that will not work toward the common goal of improving the university's international standing; on the other hand, UT will not to impose hires which are unwanted by the laboratory. By adhering to the UT's Pact, colleges commit to the following process, which will be operative from year 1 on.

- Competition will be favored against narrow definition of jobs.
- For each recruitment, UT selects the job profile and the selection committee, under recommendation by the recruiting college. UT chooses a local scholar not affiliated with the recruiting laboratory to sit on the selection committee. This "representative of UT" must remind the committee of UT's overall excellence target and hiring policies, and is accountable to UT. In particular, (s)he reports to UT if (s)he observes any dysfunction in the process.
- Selection committee members disclose potential conflicts of interest.

### ***Specific provisions for the recruitment at the Professor level***

Colleges commit to abide by the following principles:

Pillar 1: Forward-looking hiring process. High-level senior recruitments most often conclude a multi-year process. Accordingly, UT encourages the creation of consultative field-level recruiting committees that a) are composed primarily of the researchers with the best publication record in their field in Toulouse and b) engage in prospective planning of potential hires in the years to come. It will also reflect the need to preserve a memory within the selection process.

Pillar 2: External assessment. In the case of senior hiring, the recruitment process is reinforced by a systematic resort to confidential outside letters. The credentials and potential conflicts of interest of letter writers are documented, so as to help UT to assess the quality of the process. The process is similar to that for international chairs (described in section 5.3.2). Requests for comparative letters are sent out by UT to outside experts in the field. The experts are asked to rank-order the candidates and to ask which/whether the appointment will operate in the direction of making Toulouse a world-class university. The selection committee has access to the comparative letters and is instructed not to make any appointment unless "substantial consensus" (and not only a mere divisive majority vote) is reached.

### ***Commitment to strengthening UT's perimeter of excellence***

UT colleges are firmly committed to building a world-class research university. They will match/tailor UT funding to the IDEX programmes described section 5.3.2. They also commit not to betray UT's commitment to allocate 80% of its funding to the perimeter of excellence by reducing the teams' or programmes' member-level budget that would have prevailed in the absence of UT support.

### ***Commitment in favor of interdisciplinary teaching programmes***

Colleges commit to ensure multidisciplinary training programmes project feasibility: A common weekly slot (half a day) dedicated to multidisciplinary training, shared class rooms,

and teaching load dedicated to multidisciplinary courses. UT members commit to allow faculty to teach in another college; credits and debits will be netted globally rather than bilaterally.

### ***Chart of ethical scientific behavior***

UT members commit to best practices overall. In particular, within the first year of existence, UT, in strong collaboration with the Academic Senate, will draft a single chart of ethical behavior that will apply to all its members. This code will cover a wide range of ethical questions, including the protection of (graduate) students from non-academic influences in their production, faculty reporting on outside professional activities (compensated or not) and more generally potential conflicts of interest, as well as a Student Code of Honour ruling adequate conduct in connection with the management of research activities. The AS and UT will decide whether to create a subcommittee in charge of investigating potential misconducts.

### ***Signature in publications***

All researchers working in a UT research unit use the “University of Toulouse” as their primary affiliation for all their publications. This rule is immediately implemented.

### ***Credibility of the Pact between 2012 and 2018***

Colleges are truly committed to implementing the drastic changes outlined in this application. It is expected that our collective pledge will form the basis for the mutual respect of the Pact and the implementation of institutional change; and the spirit of the governance will be to first resolve differences through engagement rather than through a formal, legalistic process. However, we must also address the possibility that one college fails to abide by its commitment. No rule is complete without a specification of what would happen in the (hopefully unlikely) case of improper behavior.

The following incentive/commitment devices will make the proposed evolution credible. Because drastic reactions to non-conforming behavior seldom work, prompt actions under a due process are included to the Pact, so as to establish such credibility:

- Warnings can be issued by either by UT’s chancellor or its research director.
- Upon a repeated violation, a panel with a majority of independent members will be formed to assess the violations and propose a remedy or sanctions. This panel will report to UT’s Board, which will convene and give a ruling in the absence of any director belonging to the institution. To be credible, sanctions will be quasi-automatic through a reverse majority voting mechanism: The panel’s decision is adopted unless all members reject its findings in a secret ballot.
- Sanctions consist of a graduated withdrawal of access to IDEX funding and other services (labeling, etc.), with as a last resort the possibility of final eviction of the member/unit from UT.

Again, since the members have commonly designed and converged on the Pact, intrinsic motivation and peer pressure should suffice to guarantee conformity to the norm.

### **5.3.2 IDEX PROGRAMMES IN FAVOR OF THE PERIMETER OF EXCELLENCE IN RESEARCH**

The IDEX fund will be allocated to maximize UT’s attractiveness and excellence, with a particular focus on its perimeter of excellence UT\*. But one needs to keep in mind that the

financial resource from IDEX will not exceed 4% of the global budget of UT. This is why UT will be very selective in its allocation. The fund will be concentrated on supporting actions that cannot be financed from other sources, thereby eliminating the risk of crowding-out so common in the French scientific world characterized by the multiplicity of agencies. The IDEX fund will be used as an incentive scheme to promote excellence at the individual and collective levels. It will thereby support the merging process of UT.

***Challenge: Attractiveness and competition in the global academic world of the XXI<sup>th</sup> century***

Scholars are the driving forces of universities and research centres. A research team is only as good as its scientific staff and recruitment strategy. Scientific and intellectual leadership, often concentrated at the level of individuals rather than institutions - even if one cannot exist without the other - is a key element in the dynamism of a nation and its industry.

UT will place the current and future intellectual wealth of our human capital at the very heart of its scientific and educational policy, in particular in its perimeter of excellence UT\*. UT's ambition is to bring and retain talented French and foreign scientists in Toulouse and to help renew the appeal of academic careers for the most successful researchers in France.

To benefit from such a "brain drain", countries and academic institutions must have two assets: a clearly defined decision-making structure within the institution; and attractive and differentiated recruitment and promotion policy based on the assessment of academic merits. In an academic world in which merit-based compensation is the golden standard, those institutions which do not follow this norm face the risk of losing their academic strength in the long run. The five programmes described below are fully focused on solving this problem for UT's perimeter of excellence, UT\*.

	<b>IDEX Programme</b>	<b>Objectives</b>	<b>Instruments (Evaluation by GSE)</b>	<b>Target 2016</b>
1	Funding of LABEX	Support to the established excellence	Subsidiarity principle applies	8 LABEXes Reevaluation of excellence by GSE
2	Chairs	Reverse brain-drain in favor of best research units and emergence	Renewable 5-year competitive research position (tenure track)	60 (steady state 100) junior and senior chairs
3	Equipment	Reinforcement of attractiveness of experimental units	Co-investment in equipment between €100K and €1M	Installment of 20 High Tech facilities
4	Strategic Thematic Actions (STA)	Support to strategic industry-related research units (aeronautics, agro, health)	Call for research proposals co-managed with partners (RTRA/S, IRT, clusters)	Reinforcement of excellence in research and innovation in these fields
5	Cross-Cutting and/or Emergence Scientific Challenges (CEESC)	Support to excellent interdisciplinary actions	Call for interdisciplinary research proposals	Creation of active bridges across fields and UT units

The IDEX fund that finances these 5 IDEX Programmes will be strictly separated from the other financial resources of UT, in order to guarantee that at least 80% of its revenues will specifically finance them.

**IDEX Programme 1: Strengthening the LABEXes**

The LABEXes which have been approved by the CGI will receive up to 50% of Toulouse-IDEX's resources. Funding for these LABEXes by the State is currently limited to 10 years. By contrast, IDEXes will be granted a non-consumable endowment to allow the long-term funding of these actions. The labelling of the IDEX project of Toulouse will benefit the LABEXes by freezing that part of the IDEX capital necessary to finance on a permanent basis their annual budget certified by the CGI. The governance of this specific programme of UT will be based on the subsidiarity principle, i.e. LABEX directors will autonomously implement the programmes described in the LABEX projects, as long as they satisfy the terms of UT's Pact.

**IDEX Programme 2: Permanent chairs**

IDEX resources that are not allocated to the LABEXes will mainly be used to create non-earmarked chairs. This *reverse brain drain* programme is aimed at attracting and retaining in Toulouse researchers that could gain a permanent position in the top20 universities worldwide. It will be a *bottom-up* and open process, where the entire scientific community of Toulouse will be entitled to put forward a proposal. It is expected that a large fraction of the recruitment proposals that will be positively evaluated by the GSE originates from units in UT\*, but UT will be eager to support truly excellent candidates supported by teams outside its perimeter of excellence.

The college of the team that proposes the chair, potentially with other partners (research institutions, local public authorities, private donors,...) contributes resources necessary for its appeal and its operation. This concentration of resources for the creation of permanent positions is justified by the fact that any first-class recruitment drives significant spill-over effects. The multiplier effect relates both to the ability of these scholars to attract funding for scientific projects (ERC, ANR, etc.) and technological platforms (CNRS, INRA, INSERM, etc.) but also to the long-lasting impact of this recruitment on the dynamics of the host team: strengthening the attractiveness of the team, the exchange of ideas, access to new overseas networks, etc.

The structure of chairs is very flexible and responsive to the needs of each discipline. In certain fields where the lack of international competitiveness has a bearing on career prospects, IDEX funding will be focused on partial teaching load buyback and on the payment of a merit-based bonus for competitive excellence, supplementing employment pay provided by the host institution. In other disciplines where the lack of appeal is related to equipment, UT may be able to bolster this appeal by offering joint funding for this equipment. In all cases, chairs will provide adequate funding for a research budget, visitors, post-doctoral grants and even pre-doctoral and doctoral grants. As a domino effect, this funding will benefit the entire host team, its college, and UT.

At the junior level, the members of the UT will offer assistant professor positions based on a once-renewable three-year contract (in accordance with international standards). An in-depth evaluation of their performance by UT and its colleges on the basis of external comparative letters will condition the transformation into a full professor status beyond this period, and the reinforcement of the multidimensional support by UT.

Chairs will not be allocated to researchers already in Toulouse. The duration of the chair is 5 years, but it can be renewed after an evaluation by the GSE in partnership with the host college.

**IDEX Programme 3: Equipment**

The attractiveness and the strengthening of excellence in certain disciplines largely depend on the type of equipment available for scientists. Physics, chemistry, biology, universe and environmental science, human and social sciences all require instrumental, animal and analytical platforms as well as equipment necessary to carry out scientific calculations that meet international standards. France lags behind in this area. Because of this, local teams are unable to compete in the international arena. All actors report time-consuming procedures, which require multiple funding and that results in purchasing equipment several years later than our competitors. This is a major drawback; it is in the first years that publications originating from new equipment are the most quoted. Permanent technological progress means that we need a renewal programme supported by a policy aimed at developing new equipment. This equipment policy will improve our attractiveness to the best researchers. The IDEX funding will focus on co-financing intermediary equipment – in-between laboratory equipment and very large equipment. Expressed in monetary units, the maximum size of the equipment for consideration in the UT's call for projects will be 1 million euro, to be shared with other partners.

**IDEX Programme 4: Strategic Thematic Actions (STA)**

UT will implement a specific programme around three Strategic Thematic Actions in three sectors in which UT has strong scientific forces, namely 1/ aeronautics-space-embedded systems, 2/ interdisciplinary research and technologies for innovative cancer treatment, and 3/ sustainable production and agro-resources. The objective of each STA will be to support multidisciplinary research projects on upstream problems emerging from deadlocks clearly identified in its socio-economic sector. The STA Programme will promote international exchanges and actions to enhance the attractiveness of the site, support outstanding publications, the staging of scientific events, and participate in the organization of a new PhD training programme that uses multidisciplinary approaches. STA will also co-ordinate the definition of projects submitted to the other IDEX programmes (chairs, equipment).

The financing of each STA will be shared between the IDEX fund, UT (through the colleges involved), national research institutions and industrial partners. For each STA, a *steering committee* including representatives of the stakeholders will be set up. The main function of this steering committee will be to define the calls for projects derived from a common vision of strategic roadmaps built with the competitiveness clusters (and with the RTRA STAE and the IRT AESE in the corresponding sector). The responses to these calls for projects will be submitted to specific assessment and selection committees designated by the GSE and will have to meet the same excellence criteria as those requested for other IDEX programmes. UT's SATT will be mobilized to promote the outcomes of UT's research, in particular those from these three strategic STAs.

**Box 1: STA "Aeronautics, Space and Embedded Systems"**

Toulouse is characterized by the exceptional presence of the aeronautics and spatial industries in training, particularly through the presence of ISAE and ENAC, in public-private research, with institutions like the ONERA and the CNES, and in employment with large-sized companies like EADS and Thales. The scientific challenges of aeronautic and spatial systems are extremely vast and require a wide range of scientific and engineering disciplines, ICTS, and even social and human sciences to deal with inherently cross-disciplinary subjects. Based on the specific skills of UT laboratories, STA will address scientific challenges associated with the reduction of environmental impact of air traffic (future propulsion

systems, aero-acoustic, air traffic optimization...), human-system interactions, self-diagnosing intelligent systems, geo-location and satellite navigation, the economics and safety of air travel, all of them relying on the development of multi-physic simulation tools for complex systems, sensors, data assimilation, formal engineering of embedded systems, morphing structures, understanding of climatology and water resource evolutions by Earth observation...

This STA will consist in an evolution of the RTRA Science and Technologies for Aeronautics and Space (STAE) to take into account the support from UT, and it will be strongly connected to the newly created IRT AESE, and the world-class competitiveness cluster Aerospace Valley (560 companies and institutions for the two Midi-Pyrénées and Aquitaine regions). This action will strengthen the orientations already decided upon at Regional level, especially the confirmed investments of UT, Regional authorities and CPER in building up the Toulouse Montaudran Aerospace campus.

**Box 2: STA IRITCT “Interdisciplinary Research and Technologies for Innovative Cancer Treatment”**

Curing cancer poses a triple challenge: biomedical, technological, and industrial, in which clinical research plays a key interdisciplinary role. Only a deep understanding of cancer biology associated to innovative technologies will allow scientists, clinicians and private partners to develop innovative cancer treatments. UT, which meets the requirement for this integration of approaches, is particularly well placed to meet the medical and scientific challenges of the cancer research of the future.

This STA will lean on the RTRS RITC, created in 2007 to gather the main research strength in oncology. The theme of the network focuses on the UT domains of excellence, the development of therapeutic molecules, and has been structured around four strategic interdisciplinary sections: (i) discovery and validation of new targets on tumor bank, (ii) preclinical testing and therapeutic associations, (iii) clinical validation of new therapeutic molecules in proof-of-concept studies, and (iv) new criteria for the assessment of the clinical response to treatment. The main scientific objective is to accelerate a basic science-based drug discovery and industrial transfer in oncology. The network activities are focused in particular on hematological malignancies, breast cancers and the digestive tract, pathologies for which Toulouse retains key opinion leaders. In the next two years, the Institut Universitaire du Cancer (IUC) will be launched in the Toulouse Oncopole. IUC is an ambitious joint initiative launched by the Claudius Regaud cancer Institute and the University Hospital, to create a health care centre orientated towards innovation and research. The IUC double mission is to improve healthcare at regional level and to develop translational research in close collaboration with all the partners on the site as well as to improve the clinical trials and epidemiologic studies.

This action will strengthen the upstream orientations already decided upon at regional level, especially through the setting up of Oncopole, the Toulouse cancer research campus around which academic, institutional and industrial players federate. The Oncopole will include the Cancer University Institute (CHU, ICR), a hospital geared toward research and innovation, and the Cancer Research Center INSERM-UT that federates the INSERM-UT laboratories.



**Box 3: STA SUMS-4F “Sustainable Management Systems of natural resources and the environment for Food, Feed, Fiber and Fuel in a context of global change”**

In the current context of multiple global change (climate change, decreasing biodiversity, strong demography growth, increasing food demand, etc), it is vital for mankind to invest in the study of the interrelated mechanisms that govern the functioning and interactions of environmental systems and human activities, while dealing with the rarefaction or overexploitation of natural resources (water, soil, biodiversity...). Especially, the sustainable management of the planet has accordingly become a major domain of actions for public decision-makers. Only a deep understanding of the dynamics of environmental and human systems, needing large infrastructures, delivering different scale of observation, can allow scientist to develop innovative approaches in the field of conservation and agriculture. The questions of high added value in terms of public policy -as for instance the management of sustainable anthropic ecosystems in agricultural and food sectors, the integrated health management for plant and animals, the management of biodiversity and of natural resources (water), as well as the development of alternative energy- are related to crucial interdisciplinary issues. A cross disciplinary fertilization of ecology, plant biology, agronomy (agro-ecological approaches) and economics and social sciences should thus be considered as a high priority objective to face these challenges.

A major goal of UT is to foster such multidisciplinary approaches, based on the following recent initiatives (Toulouse Agri Campus, DIPEE, GENOTOUL platform, LABEXes TULIP and IAST). Since agriculture, food and forestry represent the first employment sector in Midi-Pyrénées, based on the association with a wide range of socio-economic stakeholders (demonstrator TWB, AgriMip Innovation Sud-Ouest and Water competitiveness clusters), these cross-disciplinary approaches will further pave the way for a regionally embedded innovative production sector.

Significant scientific shifts are expected to emerge from this cross-disciplinary initiative both in terms of concepts and technologies. Facilitating major breakthrough based on green and white biotechnologies, research units and technologies platforms will contribute to the development of the future bio-economy. As a result, within the context described above, young students, future educators and/or researchers in the Midi-Pyrenees area will benefit from this powerful cluster favouring interdisciplinary approaches in order to tackle major societal challenge.

***IDEX Programme 5: Cross-Cutting and/or Emerging Scientific Challenges (CCESC)***

UT needs to go beyond the disciplinary frontiers to take up to the major challenges of the XXIst century. Our organization, vertically structured into scientific fields, does not encourage the emergence of new areas of research at the frontiers of knowledge. In order to face these challenges, UT will provide seed funding for network building projects and emerging research projects focused on two goals: cross-cutting and/or emergence scientific challenges. First, relying on the fact that many scientific discoveries appear at the frontiers between disciplines, with a very productive cross-fertilization, UT will establish a prospective strategy in which researchers from different centers, academic institutions and disciplines will interact through workshops, seminars and interdisciplinary think-tanks. This internal dynamics will generate new research projects that could be submitted to the other IDEX programmes. Two examples of such possible cross-disciplinary initiatives that are emerging are set out in boxes 4 and 5 below. The second goal will be to bring to the fore teams or

networks of teams that can compete effectively for national or international financing (ANR, ERC, PCRD, etc.). This programme will also finance temporary chairs to support emergence.

**Box 4: Toulouse – Gerontopole / Institute on Ageing Sciences and Disability Prevention**

The overall goal of this UT Institute is to prevent functional decline (cognitive & physical), frailty and disabilities with advancing age. This programme will challenge the impact of the French and Worldwide ageing population by joining the expertise ranging from basic sciences to clinical research, public health, and health economics in the field of ageing. Many actions of the institute will involve researchers from different fields. For example, the institute will manage a community-based cohort of 1,600 (already recruited) adults aged 40 to 80 years who will be followed every 2 years for 10 years. The study of the cohort will help experiment biomarkers and imaging to characterize the prevalence of main age related pathological events and their respective role on functional decline, frailty and disability with advancing age as well as their health economics impact. Pre-clinical studies will implement specific cells and animal models, test potential biomarkers, and facilitate the development of novel pharmaceutical/nutritional interventions.

**Box 5: Modelling and Processing of Information for System Biology platform (MIBS)**

Life Sciences face the surge of high throughput data, in genomics and imaging in particular. From the basic management of data to its integration into explanatory mathematical models, through appropriate statistical processing, the handling of very large masses of information has become a major issue for biology. Making sense of these masses of data, as well as answering new scientific questions that can be asked on the basis of such information, are the issues in integrative and predictive biology and ecology that teams are currently addressing. Faced with these challenges, UT designed the MIBS platform as a place for meetings and setting up cross-disciplinary projects between biologists, IT specialists, mathematicians, chemists and engineers to prepare together new concepts and new tools for Systems Biology. MIBS creates a network of relationships around cellular and medical imaging, the processing of "omics" data generated by DNA sequencing, mass spectrometry or NMR and the analysis and modelling of complex systems. MIBS will aim to encourage each discipline (biology, material sciences, mathematics, life sciences) to benefit from the experience of others, contribute to a less compartmentalised education project and promote a genuine trans-disciplinary UT campus culture.

**5.3.3 SELECTION PROCEDURE FOR THE IDEX PROGRAMMES**

Excellence is the only relevant criterion in the process of evaluating and selecting projects. A decision-making body, whatever form it takes, cannot pride itself on universal internal expertise for judging the quality of a recruitment or priming project. Furthermore, the risks of conflict of interest are too high for it to have recourse to internal on-site expertise. UT puts in place a Group of Scientific Evaluation (GSE) to perform this task. The GSE is composed of first class scientists from outside Toulouse, whose international scientific credentials are on a par with those of the members of the ERC selection committees. Its composition is decided by the board of UT.

In order to compose the GSE, the UT chancellor and research director first draw up lists of internationally well-recognized scholars in the various broad fields. These scholars are meant to both carry substantial scientific prestige and to know/have easy access to other potential

referees if a specific need occurs; being located in a top school may be a plus in this respect. To attract such scholars, UT commits to alleviate their workload and to focus it on their field of excellence. The primary source for names will be the “Comité des Sages” (Committee of Learned Experts). The members of the committee will be asked to provide at least 3 names each (including themselves). They of course can (should) provide more names, including in other disciplines than their own, provided they feel they have sufficient information. The members of the academic senate will also be able to provide names (in that case with the corresponding resumes). The chancellor and the research director choose from the global list. The list is then approved by the “Comité des Sages” (an individual name is approved unless three members of that committee assess that a better name could be easily selected) and finally by the Board of Directors. Both are beforehand provided with detailed resumes of the selected scholars.

The GSE meets once a year for a three-day evaluation session. At the end of the session, all projects are ranked by the GSE in a single short list that is transmitted to the director, who acts accordingly in partnership with the co-financing institutions, before a formal approval by its board. An annual report of the global evaluation and selection procedure is prepared by the director and then transmitted to the AS for an ex-post appraisal of actions. The whole annual process is hereafter described in an illustrative chart for chairs. The selection process for other IDEX programmes is similar to it, with some adaptation to take into account their specificities. This process is characterized by a strong interaction between the management of the bottom-up dynamics by the UT and its partners, and the evaluation process put in place by UT. The selection of a project is conditional to a joint approval by the college and by UT. This approval by the hosting college is made ex ante whenever possible (first chart), or in parallel for chairs (second chart) due to the specific calendar constraints of this programme. A “fast-track” procedure can also be considered in situations requiring a rapid decision in response to market conditions.

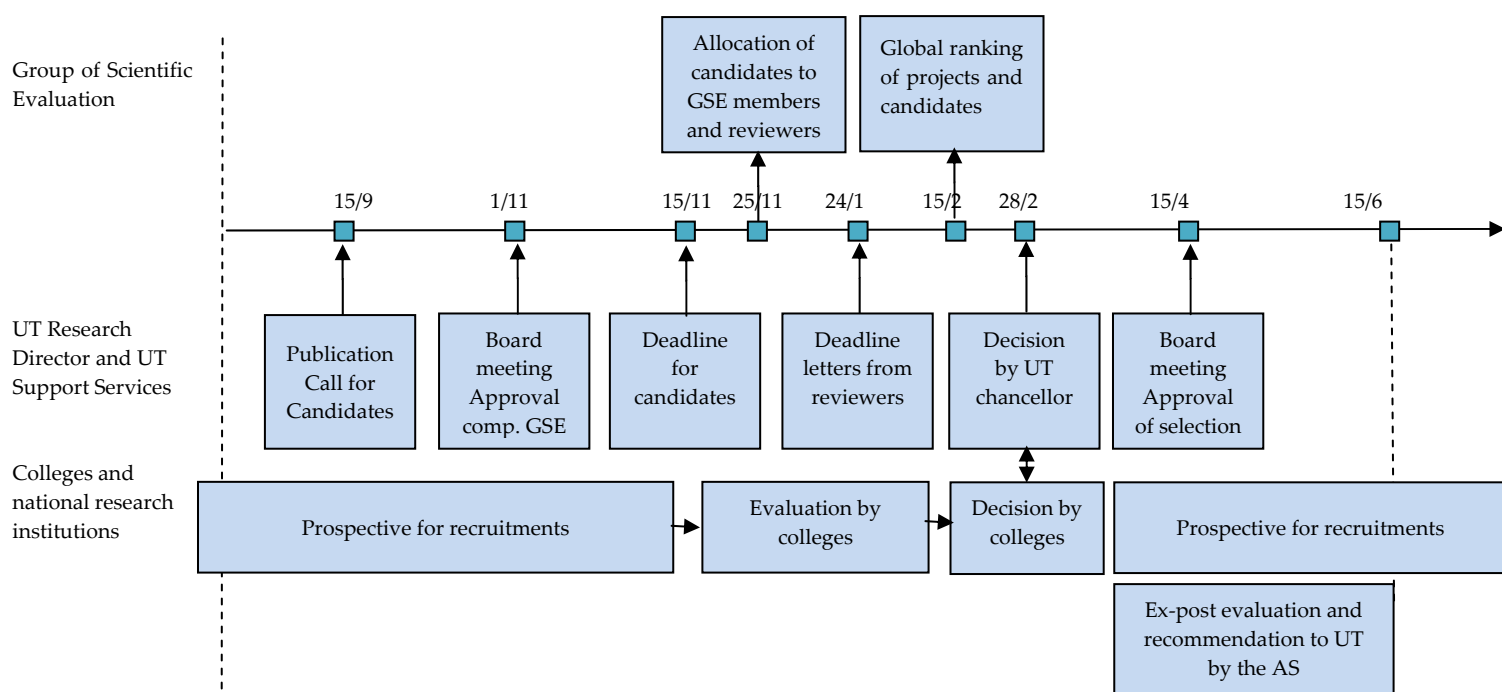


Chart: Selection of IDEX chairs

For each application of the 4 operational IDEX programmes, the chancellor and the research director of UT will put together a list of reviewers in the relevant discipline. The experts' qualifications will be clearly described in the submitted files. Following the exploratory/pre-selection efforts implemented by the UT and its members, the selection of projects and candidates by UT is a three-step process: Call for applications, evaluation, and decision.

Each year, the chancellor of UT announces and publishes a “white” call for tenders for new chairs, CCESC and STA projects, and equipment. The number of permanent chairs to be allocated is not fixed as it depends on the quality of proposals. In the normal process, chair applications are submitted in the autumn for a final decision at the beginning of the following spring, with a view to implementation in September.

The evaluation of the candidates will comply with the following principles:

- a. At the beginning of the campaign, all applications are compiled by UT's chancellor (or, through delegation, UT's research director). The chancellor makes sure that for each proposal a minimum of ten comparative letters from external experts are obtained, which is considered as being compliant with international norms. These letters will be confidential in accordance with international norms.
- b. For permanent and temporary chairs, external experts will provide an expert evaluation, which must answer the following questions:
  - i. In your field, how would you rank the candidate a) within France, b) in Europe, c) in the world?
  - ii. Where would you expect the candidate to receive a tenured appointment: top 10 departments in the world? 10-20? 20-30?
  - iii. Can you think of other researchers our search committee has not identified and who would be better qualified to fill this chair and might possibly be induced to work in France?
  - iv. Do you think that the candidate will maintain the quality of his contributions achieved so far?
  - v. How do you assess the match between the candidate and research centre XYZ where he/she would be hosted in the event of recruitment?
- c. For requests for seed money or cross-cutting and equipment programmes, the experts will be asked to comment on the quality of the team that is applying for financial support (French, European and world ranking), on the feasibility of the programme and on the match between requested resources and expected results.

The GSE organises an internal meeting to discuss the expert reports, the CVs and any other relevant information. It compares the applications in terms of disciplines and time, with the objective of ranking proposals according to their potential of bringing Toulouse to the top 50 in the world academic community. Each member of the GSE agrees to ensure the confidentiality of all discussions. A public assessment report is nevertheless carried out by the Committee once the process has reached its conclusion. At the end of this process, the GSE submits to the chancellor a single ranked list of the best projects. UT's Board makes the final decisions upon recommendations of the chancellor.

UT passes on the decisions taken at the end of this process to UT's Academic Senate and to colleges that may be involved in funding the projects. In most cases, colleges will pre-commit on their financial support of the project prior to the evaluation by the GSE, in accordance with their own rules.

#### 5.3.4 PERFORMANCE MEASURES IN RESEARCH AND MILESTONES

The (founding) Academic Senate of UT has worked on a set of criteria to measure the degree of excellence of UT. This has been done with a two-fold objective. First, it searched for the most appropriate criteria of excellence within the community. Second, it established instruments to measure our progress over the years, with a target in 2015 and in 2021. Because of the well-known difficulties to define universal indices, it has been decided that each of the six fields of competence would submit its own gamut of measures. The AS discussed these proposals to converge towards the following list of criteria.

Criteria	current	2015	2021
# publications in Nature(group) and Science	12	19	26
# grants ERC (cumulated)	1	3	6
# researchers with h index > 20	93	120	150
annual revenues from industrial contracts	6039 K€	7500 K€	10000 K€
budget ANR or Europe Fund	15885 K€	19000 K€	23000 K€
# patents / year	11	20	30
# international master functioning	6	8	10
# students in Masters (M2R)	310	390	470

*Field of competence: Life Sciences*

Criteria	current	2015	2021
# publications in Science or Nature	3	5	7
# ERC grants (cumulated)	1,5	4	6
# IUF members + CNRS silver (cumulated)	19	22	25
active patent licenses at specified date	19	25	30
M€ of direct industrial contracts	2	2.2	2.5
# international masters in English	2	3	4

*Field of competence: Sciences of matter*

Criteria	current	2015	2021
# publications in top 5% journals (EP mathematics)	7,1	8,0	10,0
% in top 25% journals (EP informatics)	52	60	75
% in top 25% journals (EP engineering & systems sc)	50	60	75
# ERC grants (cumulated)	0	2	6
# IUF members (cumulated)	8	10	12
# international master	4	6	10
# PhD per year	274	300	350
# patents and licences per year	35	40	45
# start-ups per year from lab's activity	1.1	1.5	3
# visiting scientists in and out	250	300	350

% of researchers with scientific production	85	90	95
% of researchers in Units ranked A or A+ (in France)	3rd	2nd	1st
% of Units ranked A+ vs A	62	70	80

*Field of competence: Mathematics, Information and Engineering Sciences and Technologies*

Criteria	current	2015	2021
% national publications ( meteorology)	25,1	26	28
% national publications ( geosciences)	10,4	11	12
% national publications (astrophysics, astronomy)	11,8	12,2	13
# researchers with h-index > 25	26	28	30
# ERC, silver CNRS, equivalent international awards	20	24	30
# industrial partners	50	55	60
# international masters	2	3	5
# PI in cooperative project	20	22	25
# international cooperations	69	72	75

*Field of competence: Universe, Planet, Environment, Space*

Criteria	current	2015	2021
# yearly publications top 20 (management)	3	4	5
# yearly publications top 5 (economics)	7	9	12
# ERC grants (cumulated)	8	12	16
# IUUF members (cumulated)	13	17	23
# researchers with h index >30	7	10	14
Median h-index among TSE members	5	6	9
% recruitments of scholars initially abroad	56%	60%	65%
Worldwide RePEc ranking of economics departments	11th	10th	9th

*Field of competence: Economics and Social Sciences*

Project	Criteria	current	2015	2021
PAST	# PI international archeological programmes	9	15	20
PAST	% researchers pre/protohistory g index > 10	30%	50%	67%
PAST	# publications in list AERES ERIH A	N	N x 1,5	N x 2
RAPAL	# collections and reviews managed by team	20	25	30
RAPAL	# foreign researchers invited by teams	25	35	50
RAPAL	# contracts of international cooperations	5	7	10
CULT	% researchers with h index > 10	33%	50%	67%
CULT	# publications in reviews ranking AERES A	N	N x 1,5	N x 2
CULT	ERC grants (cumulated)	0	1	2
SMS	# publications	360	500	700
SMS	% researchers with h index > 6	33%	40%	50%

*Field of competence: Heritage, Apprenticeship, Creation, Society*

This centre also established a list of criteria for the entire PACS community, as follows:

Criteria	current	2015	2021
% of publishing scientists	75%	81%	90%
Ratio defended PhD/new graduate students	53%	65%	75%
% of foreign postdocs	15%	25%	40%
# PCRD programmes per year	5	7	10
# ERC grants (cumulated)	0	2	4
% own resources from contracts in total budget	54%	60%	67%

*(Extended) field of competence: Heritage, Apprenticeship, Creation, Society*

Finally, the GSE will define a list of global criteria of scientific productivity that will be used by UT to measure annually the progresses of the virtual campus of excellence UT\* and the university as a whole. The UT's Observatory of performances will be in charge of this effort, in partnership with Thomson-Reuters. Precise quantitative objectives will be determined by UT's board. A first set of global objectives, presented below, have been approved by the community. They complement the sets of field-specific scientific criteria presented above. With the help of UT's Observatory of Performance, the performance evaluated on this basis will be assessed, and actions will have to be decided by the boards in case of non-compliance with the milestones.

	current	2015	2021
<b>Scientific productivity</b>			
# of highly cited scientists (ISI)	5	7	12
# PI of ERC grants (cumulated)	13	20	40
# CNRS medals (gold or silver, cumulated)	13	15	20
# researchers in IUF (cumulated)	36	45	57
% of international coproduction of papers	45%	50%	55%
% of scientific production in France (OST)	5.3%	5.5%	6.0%
<b>Attractiveness on the job market</b>			
% of external recruitments (junior)	36.47%	60%	100%
% of recruitments abroad	7.4%	12%	25%
<b>Economic output</b>			
# of new patents/year	50	70	100
annual income from patents	0.5M€	0.7 M€	18.0M€
# of new start-ups/year	2	4	10
<b>Higher education</b>			
% students with a multidisciplinary curriculum	1.5%	8%	15%
# masters Erasmus Mundus	4	8	15
# students enrolled in Bachelor* and Master* courses	180	500	1,000
# students enrolled in engineering Masters courses	2300	2500	3,000
<b>Campus life</b>			
% students having access to the global internet facilities	50.5%	100%	100%

Table: Global performance criteria and their milestones.

### 5.3.5 TRAINING

The mission of the new University of Toulouse (UT) is to achieve excellence in higher education and to meet the challenges of the knowledge economy. In line with this mission, the IDEX education project is centered around three objectives: to promote and identify excellence, to significantly shape students' learning environment, and to be relevant to the socio-economic community. These objectives will be attained through the following specific actions undertaken at UT:

	Action/Key Objective	Main Challenges	Instruments	Target 2016 (/year)
1	Selectiveness and excellence in bachelor degrees	To design excellence training programmes	Creation of Bachelor *	1,000 bachelors* (4,000 students enrolled)
2	Developing top level programmes in Engineering	To meet the growing needs of the regional industry and reach 10% of national flow	Creation of new Master, apprenticeship and Bachelor* in engineering	3,000 Master engineering degrees 150 Bachelors in engineering
3	Fostering multidisciplinary training programmes	To meet employers' demand for new competences and innovation	Creation of major/minor and double-degree Master programmes	10 multidisciplinary programmes and 15 minor programmes
4	Strengthening doctoral studies	To increase the number and quality of PhDs	Creation of <i>Ecole des Docteurs</i>	+50% (1,100 PhDs)
5	Implementing Quality management	To implement the international standard iso-9001 2008	Creation of a quality and performance unit and an Employers' council	20% of the UT programmes with certification (100% for engineering : EUR-ACE)
6	Enhancing students' learning environment	To increase attractiveness and to develop attractive living spaces	Scholarships and tutoring for secondary school students	+50% of scholarships and via-sup devices

#### 5.3.5.1. Improving selectiveness and excellence in bachelor degrees (*Bachelor\**)

A key feature of undergraduate programmes in French universities is the absence of selection when entering the university. The challenge is thus to design adapted training programmes to accommodate the great variety of students' profiles, while encouraging excellence. The objective is to identify students' capabilities, to guide them to build an adequate professional project, and to promote excellence by offering high standard programmes to the very best students.

To that purpose, UT will promote bachelor degrees combining two educational innovations: stepwise specialisation, and gradual selection over the three years of the bachelor degree (*Bachelor\**).

##### ***Stepwise specialization***

Excessive specialization of bachelor programmes is both a source of frustration and academic dead-ends for many students: those who enter the labour market lack adaptability and general skills demanded by firms recruiting at bachelor levels; those who continue at master level have no choice but to specialize further with limited opportunities to diversify their portfolio of competences. It is thus crucial to offer general training to broaden the range of bachelor (and ultimately master) degrees students can obtain. UT will promote undergraduate programmes that combine the acquisition of fundamental knowledge in



students' speciality, together with a sensible proportion of extra-disciplinary, or dual competence training. More specifically:

- Science students will be offered 25% of non-science classes (languages, humanities, art) to develop intellectual openness and strengthen their general skills.
- Students in social sciences will be able to enrol on mixed programmes in order to discover several fields of study, before choosing a bachelor to specialize in. For instance, students will be able to attend bi-disciplinary programmes (e.g. in economics and management, or economics and law, or law and management, or mathematics and economics or art history and archaeology...) that expand the set of future degrees they can take. The bi-disciplinary programmes also allow the very best students to graduate in two disciplines thereby enhancing their attractiveness.

### ***Gradual selection***

Excellence will be promoted throughout bachelor studies by offering the very best students the opportunity to attend more challenging classes and obtain “Star” bachelor degrees (Bachelor\*). The academic innovation consists in introducing different training paths, with adapted learning outcomes and workload. The very best students will be gradually directed towards specific excellence bachelor programmes, and later towards excellence master and doctoral degrees. Unique academic resources (small groups teaching, continuous evaluation, extra classes and tutorials, research projects, internships in labs or firms, international programmes taught in English...) will help develop excellence at bachelor level. In science, the objective is to offer 8 such “Star” bachelor programmes (in mathematics, physics, chemistry, computer science etc...) in the next four years. In addition, a Bachelor degree in Engineering (Bachelor\*) will be designed in partnership with the local industry. In social sciences, three excellence bachelor programmes will be carried out within specialized schools upon selection after one or two years of undergraduate studies (respectively in law, in economics, and in management). Around 1,000 students will ultimately obtain these upgraded bachelor degrees. Those who do not enter these programmes will continue with classical bachelor degrees.

This delayed selection in excellence bachelor degrees will also build up bridges both for students and between institutions of UT. For instance, students enrolled on a two-year intermediate degree (DUT) or other) can join star bachelor programmes in the third year. Other external students can, upon selection, enter these excellence programmes. “Star” bachelor degrees prepare students to enter Grandes Ecoles and selective Master\* programmes through adapted competitive exams. The development of these excellence bachelor programmes (Bachelor\*) is a key device to bridge the gap between universities, institutes and Grandes Ecoles, through the dynamics described in this proposal.

A good command of English is a must both in the private sector and in academia. English classes will be compulsory in the Bachelor\* programmes and a second foreign language will be strongly recommended. This will prepare students to English-taught master courses.

The submitted IDEFI projects (DEFIAL, DECCA, FREDD) will support this Bachelor\* initiative.

### **5.3.5.2. Developing high level training programmes in Engineering**

With 12 Grandes Ecoles, UT is the third national education site for engineers: nearly 8% of new engineers graduate every year from Toulouse. These *Grandes Ecoles* enrol very high level students and are viewed as strong national brands. For instance, out of 134 French

engineering schools, Toulouse schools are ranked by *l'Usine Nouvelle* 6<sup>th</sup> (ISAE), 11<sup>th</sup> (ENAC), 12<sup>th</sup> (INSA), 22<sup>nd</sup> (ENSIACET), 23<sup>rd</sup> (ENSEEIH)... These alumni sustain the dynamism of Toulouse industries whether in the world-renowned aerospace, space and embedded systems sector or in bio-engineering and health sectors, experiencing a high growth rate in the Midi-Pyrénées region.

However, engineering education in Toulouse suffers from several drawbacks. First, school fragmentation blurs international visibility despite an outflow of 2,300 graduates (Master level) per year and more than 10,000 students. Second, the percentage of engineers embarking on a PhD (12% in 2010), although higher than nationally, is too low to cope with international competition in the field of R&D. Last, too few young engineers create their own company. The IDEX project aims at making great strides in these respects.

### ***Creation of Toulouse Tech<sup>®</sup>***

UT has decided to create a College, *Toulouse Tech<sup>®</sup>*, bringing together all the engineering Grandes Ecoles of the site. Besides the obvious benefits in research, the objective is to gain international appeal (for both faculty and students), training resources (cross-curriculum, teaching practices), industrial partnerships (financing of chairs, foundations ...) and relationships with agencies and national research institutions. Each Grande Ecole will keep its national brand, but will communicate abroad with a unique label Toulouse Tech<sup>®</sup>.

In 2012, Toulouse Tech<sup>®</sup> will launch a series of structural actions to increase visibility, enhance coordination, and pool general services. Examples of such actions include:

- shared general services: joint calls for research activities (projects, researchers mobility...); a single portal to promote engineering training; a common executive education service;
- new coordinating structures: creation of an Observatory of skills and jobs, composed of CEOs, (Employers' Council –see section 5.3.5.5) to develop new programmes;
- Shared training resources: new common training modules on entrepreneurship, innovation, and research-oriented courses; new scientific courses in English; system of semester exchanges for students and faculty.

This action will be supported by the IDEFI CAPITOLE project. The next step will be to set up in 2016 the Toulouse Tech<sup>®</sup> College as a legal "Grand Etablissement" that brings together all the Grandes Ecoles of the site: INP-ENSAT, INP-ENSEEIH, INP-ENSIACET, INSA, ISAE, EMAC, INP-ENIT, INP-ENM, INP-EIPurpan, INP-ENV, ENAC, ISIS, UPSSITECH. Grandes Ecoles with line ministries other than MESR may have special status in accordance with their regulatory requirements. This structuring project will be accompanied by the disappearance of INP, the university which currently gathers 7 Grandes Ecoles of the site.

### ***Increasing the number of engineering graduates***

Together with the establishment of Toulouse Tech<sup>®</sup>, UT has the ambition to develop new courses in engineering to meet the growing needs of the regional industry (in particular in aeronautics and space industry) and reach 10% of the national flow (i.e. 3000 engineers per year). This will be achieved through the following actions:

- Creation of new joint Master degrees between Toulouse Tech<sup>®</sup> and the College of Science, Technology and Health; Development of common experimental training facilities (IDEFI projects FINMINA and E-DEFI SANTE).

- Development of apprenticeship (part time) training programmes: These are three-year training programmes involving UT and companies. Students share their time between a company and a school. These blended learning programmes are particularly valuable for employers. UT will create a common Centre of Apprenticeship Training, to develop these programmes further, particularly in the field of engineering.
- Creation of a Bachelor degree in Engineering (Bachelor\*): To meet the urgent need of local industries, a Bachelor of Engineering (Bsc\*) will also be created with a flow of 100 students / year to start, to reach 200 to 300 graduates in 10 years. This programme will be launched in close cooperation with practitioners who will intervene in courses and provide internships.

### 5.3.5.3. Fostering multidisciplinary training programmes

The objective of UT is to capitalize on its unique span of academic knowledge and resources to offer multidisciplinary training programmes over-passing disciplinary colleges. These programmes are designed to meet employers' demand for new competences, and to sustain innovation. Indeed, innovation requires transversality and interdisciplinarity. It relies on Humanities and Social Sciences to understand the needs of men with different cultures, on Economics-Law-Management to assess market demand, design patents, negotiate contracts and establish business plans, on Engineering to design and manufacture innovative products, on Life Sciences to understand their environmental impact, and at times on theoretical Mathematics and Physics to overcome the obstacles that cannot be defeated by technology alone.

The creation of the unified UT will prompt ambitious multidisciplinary training programmes. To ensure efficient organization as well as relevance for the community, the project relies on shared principles and processes and covers two types of actions spanning the next 4 years.

#### ***Shared principles and processes***

Multidisciplinary training programmes will be managed at the level of UT with a dedicated academic and administrative structure. The Academic Senate gathers suggestions from the Employers' Council (see section 5.3.5.5) and from the think-tank "Pierre de Fermat Circle", validates the new programmes and sees to their implementation.

One of the pending problems is the imperfect coordination of teaching resources and time schedules. To ensure project's feasibility, UT members agree on a common weekly slot (half a day) dedicated to multidisciplinary training, mutualised classrooms, and teaching load dedicated to multidisciplinary courses. UT will also set up a clearing house, which will enable members to exchange faculty teaching credits; credits and debits will be netted globally rather than bilaterally, and imbalances will be settled through a cash transfer.

#### ***Training actions***

These include organized and elective programmes. Organized programmes are double degrees offered by different colleges. For instance, a double master degree will be offered to scholars in engineering willing to deepen their competence in relevant management areas (e.g. masters in entrepreneurship, innovation management, quantitative finance,). This double-major programme "Engineering+Management" has already been implemented for some engineering Grandes Ecoles (INSA, INP).

Elective programmes are offered to third year undergraduate students and master students. UT students are able to validate “minor” training programmes counting for 30 credits in their “major” degree. This major/minor system covers fertile cross-disciplinary areas such as Health and Social Sciences, Arts and Sciences, Archaeology/Geography and Sciences, Sciences and Social sciences. It also allows students to build a personal educational profile. All “Minor” programmes must obtain a label from UT to be opened to students. This label certifies the quality of learning outcomes, learning methods and relevance for employment.

#### 5.3.5.4. Strengthening doctoral studies (Ecole des Docteurs)

The University of Toulouse will use IDEX to increase the attractiveness and quality of its doctoral programmes. It aims at significantly increasing the number and level of PhDs in disciplines with a short supply of doctors in light of the needs of a competitive economy (e.g. in engineering). The objective is to increase PhD degrees by 10% per year (i.e. 50% in 4 years and 150 % in 10 years).

Since 2007, a *Collège Doctoral* has initiated cooperation among the 15 PhD programmes. The main achievements have been to offer a joint web portal, some joint training modules and job placement programmes, a common graduation ceremony for PhDs, and specific PhD scholarships for interdisciplinary PhD theses. UT will build on this experience to integrate further PhD programmes, and better promote doctoral studies for students and companies.

UT will deliver a unique PhD diploma from the University of Toulouse. The Collège Doctoral will become an “Ecole des Docteurs” (School of Doctors) with a formal status and human and financial resources to better organize, coordinate and promote the PhD diploma. The school will manage funding emanating from each college to achieve the following joint actions:

- **Coordination of procedures and information:** unified student registration process; harmonized communication, both internal and external (website, unified calendar...), web platform presenting all PhD courses.
- **Promotion of doctoral studies for students:** development of research Masters programmes, promotion of laboratory research internships in M1 for engineering schools students, preparatory paths for research starting at the BSc.
- **Increasing PhD funding:** the school will try and raise the current number of PhD grants, especially in social sciences and liberal arts (through research and European contracts, funding provided by industry, local authorities, and colleges). IDEX funding will also be used for calls for projects that meet the criteria of excellence (PhD excellence grants programme).
- **Expansion of our PhD network:** at the national level, the *Ecole des Docteurs* will develop partnerships with the best French schools and universities for joint thesis supervision. At the European and international level, the School will resort to the Erasmus Mundus Master networks for joint doctoral degrees. It will also initiate scholarship with Marie Curie fellowships, formalize ties with Erasmus Mundus Doctorate and co-accredited international PhDs, sign agreements with reputable Graduate Schools and their counterparts abroad.
- **Labels to improve job placement:** the *Ecole des Docteurs* will focus on developing and highlighting doctoral skills for the public and private sector through the labelling of PhD degrees. They will be awarded by the Academic Senate and the EXCO of the University of Toulouse. For example, the label "Engineering for Private Companies" is already under construction. An "International" label will also be awarded in

compliance with the following criteria: a minimum stay of three months in an academic or industrial laboratory abroad; a full command of English (with a C1 level or above); publications in collaboration with international partners in rank A journals or international conferences; participation of international experts in the thesis jury. Other labels such as "Public Policy Expertise" and "Educational Expertise" will also be considered. IDEX will finance the training required to obtain these labels.

The Ecole des Docteurs will also organize and finance short visiting positions to increase the span of doctoral courses and foster scientific collaborations. Invited researchers will give lectures and contribute to the impetus of laboratories. They will take advantage of their stay in Toulouse to initiate or develop scientific collaborative projects. The Ecole des Docteurs will offer overseas stays to PhD students with the help of the UT chairs and ERC grants of local PIs.

### 5.3.5.5. Quality management of UT's higher education programmes

UT boasts an extensive portfolio of courses based on the diversity of its institutions which definitely meets the changing scientific and employment needs; however, this asset should be more visible both to students and industry. To address this issue, UT will promote the adoption of quality management systems by its members and organize a quality assessment procedure at the university level.

The quality management approach will follow the international standard iso-9001 2008: each training programme or institution will have to demonstrate its ability to identify its beneficiaries (students, employers), to define measurable objectives, to develop a beneficiary satisfaction monitoring system, and to adapt its training programme to improve the fulfillment of the objectives and beneficiaries satisfaction.

As for quality assessment, UT and its colleges will rely whenever possible on existing external certification procedures (like the EFMD accreditation schemes for management degrees, or the European quality label EUR-ACE for engineering degrees). In order to promote quality management of its training programme, UT will set-up two structures and one certification procedure with the support of IDEX.

- **A Training Quality and Performance Promotion Unit** will coordinate the network of quality management correspondents, guide the evolution of educational projects, and will structure the quality approach, including the definition and the analysis of students' satisfaction surveys of training programmes (either during their course of studies or one to several years after completion).
- As part of the satisfaction measurement system, **Employers' Councils** will be set up in each economic sector (aerospace and embedded systems, agronomy, bio-health...) to identify the needs and provide employers with a skill-management forward-looking tool. These Councils will report to the Strategic Orientation Committee and to the Colleges, to better tailor the training offered at UT with societal needs and to monitor the coherence of the offer on the different sites. These Councils will also help the Academic Senate initiate multidisciplinary programmes.
- For those training programmes or institutions having the lead in the process, UT will deliver a 5-year *Quality and Performance Certification* based on the international quality standards and ambitious thresholds in the performance criteria. In the field of engineering which is a strong force of UT, the ambition is that all UT engineering

training programmes (Bachelor and Master level) acquire the European quality label for engineering degree programmes (EUR-ACE).

#### 5.3.5.6. Enhancing students' learning environment

Toulouse IDEX has an ambitious programme of conferences aimed at the general public and particularly secondary school students. They will help secondary school students to become aware of current scientific issues and to develop vocations. These conferences will be a privileged opportunity to present university studies in a positive light and to tell them about the new schemes and programmes on offer.

This scheme will require a small administrative team (1 or 2 people) responsible for finding researchers willing to partake communication activities aimed at the general public, to provide them with the necessary training, and to establish the necessary contacts to organise conferences for the general public (middle schools, secondary schools, cultural centres, etc.). Moreover, it is noteworthy that UT has been selected by the French Academy of Sciences to create Regional "Houses" for Science and Technology to educate first and second degree school teachers. UT will contribute through an innovative educational offer, based on the Charpak concept of "La main à la pâte". The Midi Pyrenea House for Science and Technology based on top research centres from the Rangueil scientific campus will contribute to enhance the scientific background of school teachers in Midi-Pyrénées.

While increasing scholars' craving for UT programmes, meaningful actions will encourage students to undertake higher education studies at UT:

- **Scholarships and tutoring:** Talented students identified upstream (secondary school) will obtain scholarships throughout their studies. A moral contract, including scholarship as well as a tutoring system, will be offered to the best secondary school students. Tutors will be practitioners whose company will ensure part of the logistics. This professional tutor will act as an advisor and support the student. This scheme will be based on a system of continuous assessment and will be pursued according to the results obtained by the student.
- **"Via-sup" for higher education:** the "Via-sup" device consists of a one-year course to prepare for higher education based on a moral contract with students who have obtained a "baccalauréat technique" (vocational qualification) in order to give them the best possible chances of obtaining a university degree. The stated objective of this preparatory year is to put students' knowledge into the context of skills' acquisition, offering the best chances to succeed in the first scientific year. These students will be supported until they are enrolled on a Master course.
- **Developing living spaces:** For students engaged in excellence programmes, UT would like to develop a living space combining shared accommodation and residential teaching activities. These facilities should offer an environment for teaching support, tutoring in the context of "Cordées de la Réussite" and science related activities. To this end, UT discussed with the student welfare organization of Toulouse the "Résidence pour la Réussite" project which offers an innovative type of low cost accommodation. We also discussed with AFEV (Student association for the city) to link up with KAPS (an accommodation assistance project) programmes.

### 5.3.6 CAMPUS LIFE

Large international campuses increase their appeal by offering better students facilities. Various actions will be undertaken in this respect by UT, notably in the framework of the Campus Plan.

#### ***UT's powerful actions towards improving students' quality of life***

- The single entry point: the Jules Guesde area, showcase of the University of Toulouse, will house all the different activities (education, student life and international relations) within the UT. The facilities will be appropriate to welcome, inform and provide guidance to anyone interested in the university and its partners, the students and overseas researchers.
- Towards a better quality university catering service: UT has 11 university restaurants managed by CROUS (the student welfare organization) and 9 cafeterias which together serve up over 2.5 million meals annually. UT will transform them into "activity centres": better interconnection, extension of opening hours, e-money payment, cultural events, Wi-Fi, improvement of the quality of meals.
- Encouraging sporting activities, setting up a multi-campus sport hub: The Toulouse site wants to encourage student sporting activities by building new facilities in the city centre, by better sharing existing facilities and developing a sports policy that is open to non-students.
- Improving the environmental quality of university sites: The environmental quality charter adopted to renovate and to construct university buildings targets several points: reducing waste, improving environmental performances, using renewable energies. An inter-campus Travel Plan is under preparation; its objectives are to facilitate intra-campus and inter-campus journeys by promoting means of transport other than cars.
- A cultural policy that better involves the town: The PRES is implementing ambitious cultural policies that promote education and access to culture, encourage artistic practices, and support cultural projects and student societies. To promote community involvement on UT sites and to make the most of the city culture, the PRES organises "The Student Week" every October, an opportunity for new students to discover all aspects of student life and of the city: festivals, exhibitions, theatre, dance, rugby, music, humanitarian activities, trips, community projects, etc.
- Improving student life by better welcoming overseas students: The Toulouse site currently hosts 100,000 students. The construction of new buildings and renovation of old housing facilities are being carried out in the framework of a student housing master plan drawn up in 2009, which takes into account urban planning, student expectations and the needs of targeted populations. Between now and 2013, the CROUS social housing estate will offer 12,000 accommodation units.

A single information desk (rentals and financial assistance) and a service to manage the regional funds used as housing deposits in partnership with the Regional Council and CROUS (student welfare organization) has been operating since 2010 with a view to facilitate access to housing. By 2012, a single overseas students and researchers desk will be set up to develop services linked to housing: obtaining residency permits, help with administrative formalities (opening a bank account, etc.) and reinforcing temporary housing options.

For four years, the PRES has been developing information services for overseas students to help them to better prepare for their stay in Toulouse: annual edition of the international students and researchers guide (in French, English, Spanish and Chinese), and a map of the university site (interactive web version). Since 2010, to facilitate access to housing, a single information desk has been in place.

By 2015, all these projects will upgrade UT's campuses functionality and user-friendliness. They will become real neighbourhoods within the city and will contribute to increasing the appeal and the cohesion of the University of Toulouse.

### ***The digital university: A vector of excellence and solidarity***

Developing real digital universities, in addition to physical campuses, that connect students, researchers, lecturers and the entire administrative community for the benefit and sharing of excellence will be one of the major challenges for the University of Toulouse during the coming decade. Starting from its existing quality assets (network infrastructure, content, platforms, etc.), UT will develop its digital university, an essential factor of interdependent excellence. By generalizing easy access to enhanced digital content anywhere, anyway, and at any time, the digital university will undoubtedly transform the site. Providing all members of the community, whatever their research laboratory, subject area or status, with access to the most demanding international contents will serve each and everyone's achievement and beyond.

This strategy offers several advantages. It fosters educational dialogue between digital users and teaching teams. It reinforces UT's information systems (publications, projects, accounting for laboratories). It contributes to the interoperability and exchanges between systems. Finally, it provides consistent and comprehensive digital scientific content linked to a quality service policy. To meet these challenges, the University of Toulouse must completely overhaul its digital organizational model. The very first step will be to come up with a digital strategy for the site by drawing up a master plan, which in turn will give rise to a strategic action framework in order to develop new services and usages for the coming six to eight years. The mode of governance will also be clarified and the organization of all "support" structures for site information systems will be rationalised.

### **5.3.7 INTERNATIONAL RELATIONS POLICY OF UT**

For the past two decades, UT's members have developed strong research partnerships and reciprocal researcher exchanges, especially in the fields of economics, engineering and aeronautics, with leading universities in the United States (MIT, Stanford, Northwestern, Berkeley and Caltech), Europe (Oxford, UT Munich) and Japan (Tokyo University). Toulouse also has a highly internationalised curriculum: dual diplomas (30 for UT as a whole, mainly with European universities), Master degrees delivered in English (20 programmes), Erasmus Mundus programmes (7), off-campus courses delivered abroad (20). Finally, UT currently boasts structured academic units in Asia, notably in Vietnam and Malaysia.

UT "International Relations" division, operating at UT's EXCO level, is assigned with the task of taking the UT campus to a new level in terms of appeal and internationalisation. UT is targeting 3 major goals within a 4-year framework:

- achieve a large increase in foreign doctoral students and high level researchers;
- develop significant partnerships with the world's best universities (ARWU top150);
- target tomorrow's pools of academic excellence and open a UT campus there.



UT will set up two experimental cooperation units in Asia (2012) and Latin America (2013). Via these two pioneer units, UT will target pools of excellence in these regions and establish contractual links with the relevant stakeholders. They will be tasked with promoting the campus, increasing the flows of students and high level young researchers to UT, and developing study and research programmes locally. In 2016, UT will establish a study and research campus either in Asia or in Latin America. This pathfinder project will be implemented on the strength of economies of scale generated by UT unified structure, providing a genuine regional platform where expatriate UT students and researchers will work hand-in-hand with the local pool of excellence in specific study and research programmes (engineering, aeronautics, economics, ...).

UT will also set up a support unit for European and international projects (Europe+ unit). Given the keen competition to obtain international funding and the transverse nature of many projects, the "Europe+" unit will perform strategic monitoring of calls for projects, while providing information and networking services for UT teams working on such projects, together with project engineering assistance and institutional lobbying of funding bodies.

UT European dimension will be strengthened by its involvement in high level thematic networks and the development of partnership relations with other certified centres of excellence in Europe. This framework may include joint certification of studies, elite academic mobility, shared chairs and joint international initiatives.

Moreover, funding for mobility is clearly a key factor of UT policy aimed at developing its appeal. UT will establish dedicated funding of international senior and junior chairs, under the IDEX and LABEX initiatives, alongside a major tuition programme for foreign doctoral students. At the same time, UT will develop an active partnerships policy with foreign funding bodies (public or private) or organizations funding student mobility, in order to increase the flow of international doctoral students to UT's campus.

The choice of language of study is of capital importance when it comes to establishing an international campus. UT will undertake an ambitious initiative to develop study programmes in English at Master level, thus enhancing its international dimension, particularly when competing against universities from the English-speaking world. This initiative will focus largely on linguistic and inter-cultural training for teaching staff/researchers and the development of courses to meet international demand.

The quality of the hospitality provided and the expatriate environment are key factors in UT appeal. Toulouse, with a whole host of major intrinsic assets, has much to offer in this area. We propose to develop practical tools to assist foreign visitors, and more specifically doctoral students and researchers, in their institutional, cultural and linguistic integration. A single assistance desk as well as a package called Toul'Box will combine French language studies, accommodation assistance (information and reservation service, lease guarantees, temporary housing...), assistance with administrative formalities (residence permits, banking in particular) and access to cultural and transport services.

UT international relations division will be responsible for harmonising existing initiatives at the university's various colleges. In 2012, UT's Colleges will begin devolving authority over European and international relations to UT, while retaining local control over their dealings with their student and researcher populations. Unified international communication will also be put in place by 2012, establishing UT as both the international showcase and the sole cooperation portal for foreign partners.

UT will assess the progress it makes towards achieving the goals set out above. The application developed under its UT Observatory of Performances will include indices pertaining to study (incoming and outgoing flows of students and teaching staff/researchers; period of stay; diversity of geographic origins; number of international diplomas...) and research (co-tutorship of theses, joint publications, international seminars, research projects and structures...). Financial indices will also be set up to measure the cost-effectiveness of the funds invested by UT under its internationalisation strategy.

	<b>Key Objectives</b>	<b>Main Challenges</b>	<b>Instruments</b>
1	Achieving a large increase in foreign doctoral students and high level researchers; Developing partnerships with the world's best universities (ARWU top 150)	To increase international UT visibility	Permanent international antennas of UT in Asia and Latin America; Elite academy mobility
2	Reinforcing UT attractiveness	To attract first class foreign students	Master and PhD scholarships for elite foreign students
3	Setting up a support unit for European and international projects	To increase significantly the funded European projects both in research and higher education	Creation of the "Europe+" unit

### 5.3.8 DEVELOPMENT OF RESULTS AND SOCIO-ECONOMIC PARTNERSHIPS

#### **Context**

Midi-Pyrénées is the number one region in France for Research and Development (public and private) in terms of its GDP. R&D accounts for 4.2% of the region's GDP, and corporate R&D alone makes up 2.5% of the GDP. This rate exceeds the Lisbon recommendations, which establish the threshold at 3%. In absolute value, R&D contributes €3.4 B, ranking the Midi-Pyrénées region 3<sup>rd</sup> in the country, with a contribution of 8.4% of French spending. Industrial R&D, which contributed €2.5 B, grew 55% between 2002 and 2006, resulting in an overall increase of 40% in the same period. The region's R&D activity has a direct influence on industrial employment. In 2009, the Midi-Pyrénées region boasted a trade surplus of €13 B, while the national deficit for the same period was €43 B. Industrial employment opportunities have been maintained in the region over the last three years, despite a 10% decrease in the rest of France. Midi-Pyrénées has also been the number one region in France in terms of GDP growth over the last ten years.

Three major sectors shape this region: Aeronautics, Space and Embedded systems (electronics, IT); Agronomy; Cancer Bio-Health. These sectors are grouped into three clusters of competitiveness: one international "Aeronautics, Space and Embedded systems" cluster, and two national "Agrimip Innovation" and "Cancer Bio Health" clusters. The Midi-Pyrénées region is also a major stakeholder in the inter-regional "Water" cluster.

The strength of partnerships in public and private research will be monitored using the following indicators: number of partnership contracts established in the framework of the competitiveness clusters, number of PhD "CIFRE" industrial partnership scholarships (158 agreements in 2009), number of companies created off the back of public research

laboratories (83 in 10 years), number of patents (60 in 2010), and number of joint University-Industry laboratories.

We firmly believe that this solid R&D context offers a margin of progress that will enable us to significantly increase these partnerships in order to further encourage economic development through innovation. UT's target is to double these indices by the year 2018. The aim of the projects described below is to achieve this goal as well as the governance aspects that are required to create a genuine innovation eco-system.

### ***A global strategy to reinforce synergies in the context of the IA***

The "Investments for the Future" (IA) calls for projects will act as powerful levers to help and develop this approach by setting up far-reaching projects involving academic, corporate and institutional stakeholders. UT will strengthen strategic partnerships between research, academic training and companies based on major structuring projects certified in 2011: the "Aeronautics, Space and Embedded Systems" Institute of Technical Research (IRT), Toulouse White Biotech (TWB), the Carnot Institutes for platforms in the domain of bio-health (8), and four space projects launched by CNES (SWOT, Myriad, Satellites of the Future, and New Generation Launch Vehicles). The promotion of academic research work is enhanced by setting-up a subsidiary company dedicated to technology transfer (SATT). Moreover, UT will involve socio-economic stakeholders in the governance of the Toulouse site, in particular through its Committee of Strategif Foresight, and through their involvement in the prospective effort in favor of transdisciplinary research projects. UT will also invite companies to take an active part in training via industrial internships and industrial research and training chairs, which will involve large industrial groups in the region and SME-SMI clusters.

### ***Two examples of public-private partnerships***

Two recent initiatives will have an important impact on the structure of the interaction between UT and its socioeconomic partners: IRT and TWB. The "Aeronautics, Space and Embedded Systems" Institute (AESE IRT) brings together industrial groups such as Airbus, Thales, EADS, Alstom, and SMEs who are committed to working with academic laboratories. PRES launched and manages the AESE IRT in association with companies working in the sector. In addition to the part played by PRES in the design, positioning and implementation of the IRT (the IRT project teams include two PRES assignment officers), a partnership agreement is being drawn up between UT and the IRT in the following domains:

- **International Notoriety:** The AESE IRT is an international institution. In this context, joint initiatives will be considered to promote the site by staging technology conferences, involving UT actors in the IRT international technical committee, hosting invited international researchers, and embarking on international and European collaborative research projects (network effect, project engineering).
- **Design of training courses:** One of the IRT's objectives is to participate in further developing educational material and providing new training in line with technological advances and the emergence of new skills. Furthermore, the IRT will facilitate access to its equipment and technological platforms for the purposes of academic training. The IRT will also host and supervise PhD students in close collaboration with the UT.
- **Regional development:** Although the AESE IRT is a national institution, its presence in Toulouse contributes to the building of a robust local eco-system at both the academic and industrial level. Partnerships can be envisaged with a view to generate

economic initiatives, develop entrepreneurial spirit and back projects launched by and/or nurtured in UT establishments and institutions.

- Taking part in identifying research themes in line with upstream research and technological research. This work will mainly be based on setting up an "Aeronautics and Space" Strategic Research Priority which will provide long-term coordination and support to research by positioning itself upstream of technological developments. The research work will be taken on board by IRT in order "to mature" the resulting technologies. Research will also benefit other industries thanks to an open management of intellectual property issues by SATT. This organization will guarantee a coherent approach - driven by scientific skills and market needs - in terms of innovation chain.

TWB "Toulouse White Biotech" is a centre of excellence in industrial bio-technologies which use biotechnologies to manufacture intermediary products for chemistry and biomaterials but also to produce energy. They use micro-organisms and enzymes to boost biomass. This project involves technology SMEs (Deinove, METabolic Explorer, etc.) and large-sized groups (Adisseo, L'Oréal, Michelin, Roquette Frères, Sofiprotéol, Total, Véolia, etc.) alongside academic partners.

#### ***The Technology Transfer Subsidiary - SATT***

In order to disseminate academic research among the region's businesses, PRES launched a SATT project. This private company, a subsidiary to UT, brings together UT's colleges and departments, as well as large national research bodies which are pooling their efforts and finances in partnership with the State, the Midi-Pyrénées regional council and the greater Toulouse council.

In order to strike a balance between promoting laboratory innovations and industrial requirements, SATT will simultaneously set up relays within public laboratories and a method for identifying industrial needs using existing tools such as the regional innovation agency (Midi-Pyrénées-Innovation).

A traditionally fragile population, but one which can have an impact on the economy, SMEs will be the main industrial target of the SATT in terms of access to new technologies and new solutions that SATT will help co-develop. The aim is to make SATT Toulouse an actor in developing and transferring technology by allowing it to directly invest in projects. It will provide funding and skills to laboratories to develop inventions, protect industrial developments, manage patent applications, find partners, participate in transfers and ensure legal protection. It will suggest partners, particularly SMEs in order to spread out risk taking and subsequently share the expected benefits.

This concentration of resources and skills on a single site will change the paradigm for promoting academic research: for four years 85 value-adding projects have been aided amounting to €3M of funding; in the future, we hope to support a further 50 annual projects with total funding of €2 to €10M per year. Over a ten-year period, more than €80 M will be invested in over 450 transfer dossiers for companies, which should generate 300 licences, a turnover representing tens of millions of Euros for companies, a minimum of 1,500 jobs and a financial return of €18 M for UT and its colleges.

The performance of the new tool will be evaluated in terms of spin-offs measured in the business world (new sources of turnover, market impact, new products, jobs) and on returns to the establishments (new projects, new collaborations, financial returns on using

intellectual property rights, and employing young graduates). Investments made by partners via the SATT will directly feed the growth in the coming years.

### ***Governance of the innovation ecosystem***

UT has decided to create a partnership department whose director will be a member of the EXCO of UT in order to participate in all the decisions and to closely follow the activity of these partnerships tools (IRT, SATT, TWB, etc.). The Strategic Foresight Committee of UT will include all socio-economic partners (companies, competitiveness clusters) and the local authorities with the aim to improve dialogues and interaction between the university and its clusters of socioeconomic partners.

Links between UT and its partners will also be tightened through other initiatives. For example, SATT being a subsidiary to UT, the latter will have 5 representatives on the SATT board. Concerning IRT, UT will be a founding member of the Foundation supporting the activities of the IRT.

## **5.4. GOVERNANCE, ORGANIZATION AND MANAGEMENT**

This section describes the governance of the unified UT that will prevail as of January 2018. We then define the dynamic process to get there between 2012 and 2017.

### **5.4.1 THE STRUCTURE OF THE UNIVERSITY OF TOULOUSE IN 2018**

In 2018, there will be a single university in Toulouse, whose governance will be up to the best international standards. UT will have three levels of governance: the university, the colleges, and the departments. The university will fully control the actions and the budget of the colleges (under a transparent and efficient delegation of missions from the university to the colleges), exactly as each college fully controls the actions and the budget of its departments.

#### ***UT Governance***

The University is governed by a Board and an Executive Committee chaired by a Chancellor. Two advisory bodies provide evaluations and recommendations on a regular basis: the Academic Senate (AS) and the Strategic Foresight Committee (SFC). The University Council (UC) is a forum voicing the views of the colleges in the UT decision-making process.

The Board is UT's leading body and is accountable for the fulfilment of its mission. It includes a majority of independent directors, and its chair is independent. The Board meets three times a year, and appoints and revokes the Chancellor, the directors of UT, and the deans of the colleges. The Board oversees the general strategy of UT, particularly in matters related to research, recruiting, training and external relations. The Board votes the budget and approves the accounts, adopts the internal rules, and approves the Chancellor's annual report and project. The Board also allocates the global budget of the university to the different colleges.

For the day-to-day management, the Board delegates much of its power to the Executive Committee (EXCO). The EXCO meets twice a month under the authority of the Chancellor. It is the "hard core" of the university. In addition to the implementation of the decisions made by the Board, the EXCO elaborates the actions of UT, the provisional budget, and the "plan

quinquennal". It manages the central services of the university (human resources, international relations, communication, ...). It coordinates the actions of the colleges. The chancellor and the director of research also manage the IDEX fund and the 5 IDEX Programmes in close relation with the GSE (not discussed here, see section 5.3.3). All these missions are obtained by delegation of the Board.

The Board and the EXCO rely on the Strategic Foresight Committee (SFC or COS- for "Conseil d'Orientation Stratégique" in French). To further develop the inter-relationship with its environment of enterprises and to create a real innovation ecosystem, the Strategic Foresight Committee will bring together actors from the regional system of innovation, which will be consulted on the major strategic objectives pertaining to the site.

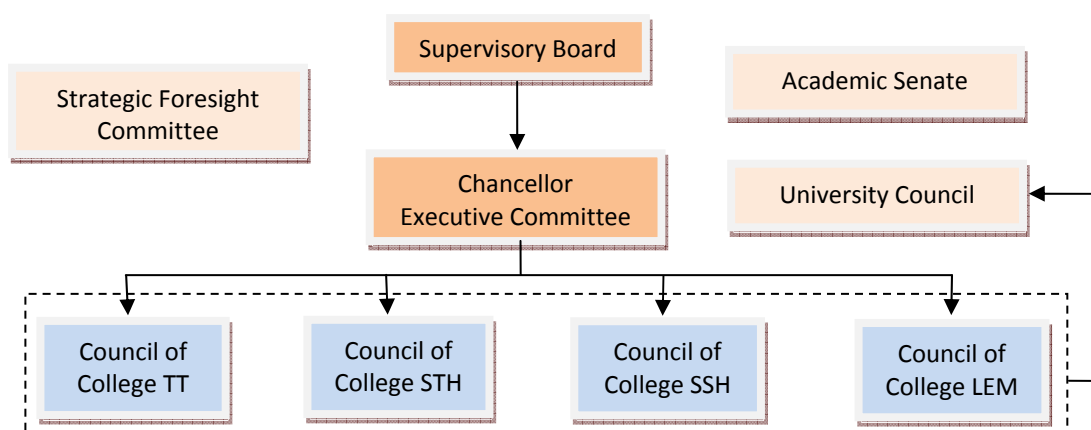


Chart: The governance of UT in 2018

The Academic Senate (AS) is empowered by the chancellor to devise academic policies. Its role is to make recommendations to the Board and the EXCO of UT on all scientific and educational matters. The AS contributes to the emergence and maturation of certain projects, especially those related to the multidisciplinary IDEX Programme CCESC. It periodically evaluates UT's actions. During Phase 2 (2014-2015) of UT's reforms, the AS will also make proposals for reshaping the number and definition of the colleges, with the aim of achieving an optimal organization of UT's missions in research and higher education. One of its first tasks will be to help UT's management to draw an ethical chart binding for the entire academic community of UT.

Each college will have its own Council of College (CC) under the authority of its dean. In addition to shaping the academic policy of the college in research and in education, the CC will also nominate the dean, who is selected by UT's Board. It coordinates the actions and the budget of its departments.

Finally, UT will create the University Council (UC), which assembles the members of the different CC. The UC serves as an annual forum of the colleges to discuss the UT strategy and actions. The UC also selects 3 of its members to sit on the Board.

### ***The composition of the governance institutions***

In order to encourage full commitment and to enable efficient argumentation, the Board will be limited to 12 directors:

- 7 independent directors
- President of the Strategic Foresight Committee
- President of Academic Senate

- 1 representative of the professors and researchers
- 1 representative of students
- 1 representative of personnel

The last three members of this list are elected by and among the members of the University Council. Like in the current French academic system, the representatives of the students and of the administrative staff do not participate in the deliberations of the Board on scientific matters, such as recruitments and promotions. The independent directors sitting on the Board have no conflict of interest with the local scientific community. They are meant to be presidents or high-level officers of academic institutions or global foundations, international companies' CEOs and global personalities from the world of research, all from outside Toulouse. They are selected on the basis of competency, independence and adherence to the scientific values embodied in this proposal.

For the first board, and as described in our previous application, UT will use an innovative way of appointing these personalities, combining proposals made by the scientific community and approval by a committee of learned experts. The nomination committee is composed of 20 members: the bureau of PRES (enlarged to two National Research Institutions), and the 12 members of the Restricted AS. This committee has the responsibility of introducing and short-listing around 15 potential candidates to sit on UT's board.

Joseph Aoun	Linguistics	President Northeastern University
Alain Aspect	Physics	Orsay, French Academy of Sc., CNRS Gold Medal, Wolf Prize
John Ball	Maths	Oxford
Guy Bertrand	Chemistry	UC Riverside, Fellow of the French Science Academy
Jean-Lou Chameau	Engineering	Caltech President
Jean-Pierre Changeux	Neuro-sc	CNRS Gold Medal – Collège de France
Françoise Combes	Astronomy	Paris Observatory, French Academy of Sciences
Antoine Compagnon	F Literature	Columbia University & Collège de France
Avelino Corma	Chemistry	Universidad Valencia, Fellow of the Engineering Academies in US
Ester Duflo	Economics	MIT, Clark medal, Mac Arthur fellow, 100 top global thinkers
Jon Elster	Philosophy	Collège de France & Columbia University, Nansen Prize
Georg Gottlob	Informatics	Oxford, ISI highly cited scientist, Wittgenstein Award
Albert Fert	Physics	Nobel Prize 2007, CNRS Gold Medal, French Academy of Sc.
Jean-François Minster	Astronomy	Research director of Total, previously director of INSU
Philippe Schlenker	Linguistics	New York University
Tom Schoener	Ecology	UC–Davies, MacArthur Award by the Ecological Soc. of America
Dan Sperber	Cognition	Dir International Cognition and Culture Instit., Levi-Strauss Prize
Wendelin Werner	Maths	Paris 11, Fields medal

Table: Composition of the Committee of learned experts.

The short list of nominees is then sent to the committee of learned experts, which selects the candidates who will sit on the board. The committee can choose names outside the list

proposed by the nomination committee. This committee is made up of top-ranking external scientific personalities. The workload requested from the committee is limited but of a high collective value. Specifically, the committee of learned experts will have at their disposal a report from the nominations committee as well as the CVs of short-listed candidates.

The composition of the Executive Committee is as follows: the Chancellor, actually acting as a CEO; 4 directors (research, education, international relations, and partnerships); the 4 deans of colleges, and two representatives of the national research institutions. The quality of the management will be crucial for the emergence of UT as a key player in the worldwide academic arena. Several actions will reinforce the executive team. First, high-skilled administrators at the top will be recruited with a competitive (merit-based) compensation package. A special attention will be devoted to the international search for UT's chancellor. Moreover, UT will provide incentives for its high-skilled administrative staff to visit other top academic institutions abroad.

The Strategic Foresight Committee will include the innovation clusters, entreprises (including representative SMEs), the local authorities, and regional innovation structures, together with CNES, CHU-ICR, CESER and CROUS. The chair of the SFC sits on UT's Board.

The members of the Academic Senate are internationally renowned among the scientific community. This is particularly true for the Restricted AS, which is initially composed of 12 researchers.

Azzedine Bousseksou	Science of matters
Jean-François Bonnefon	Psychology, director of CLLE
Bernard Dupré	Earth science, director of OMP
Luis Farinas	Computer science, director IRIT
Christian Gollier	Economics, director of TSE
Catherine Jeandel	Oceanography and marine biochemistry, president of MPI
Christian Laurent	Electrical engineering, director of Laplace
Pierre Monsan	Biotechnology, director of TWB
Pierre Moret	Archeology, director of TRACES
Angelo Parini	Cardiology, director of I2MR
Clément Sire	Physics, director of LPT
Jean Tirole	Economics, president of IAST

Table: Members of UT's Restricted Academic Senate

In the future, the election for the Restricted AS will be subject to two overarching principles: a) the scholars electing their representatives as well as eligible candidates represent the internationally most recognized -- production, international visibility -- scholars; b) the validation process must be entirely external: it could be based on solid bibliometric data (for example journal-quality-weighted publications or citation indices) supplied by a third party (Thomson Reuters or another supplier), scientific honors (CNRS medals, etc.), patents & licenses, or whatever indicator of utmost scientific achievement UT deems relevant.

The AS initially includes the Restricted AS together with 12 researchers representing the 6 local founding academic institutions, 6 representatives of the main National Research Institutions (CNRS, INRA, INSERM, IRD, CNES, ONERA) and of the 3 RTRA/RTRS. Hence, the AS initially has 33 members. The Restricted AS proposes one of its members for president of the AS to an approval vote by the AS as a whole.

The composition of the four Councils of College will be the same as the one of the Board of Directors of the current academic institutions, with a representation of the scientific



community, the students and the administrative staff. Only the dean will be selected by UT, after a nomination process within the corresponding college. The University Council is composed of the members of the four CCs.

### ***Optimal decentralization to the colleges***

The role of the colleges will be crucial in the governance of UT. UT will be twice as large as the largest US top state universities. Reactivity would be hampered if the executive and the board were to be exposed to serious overload and lack of control. Regardless of the precise organizational form, some decisions should be delegated while others are centralized. Decentralization may be optimal for one of two reasons:

- Externalities among colleges, in particular image and training externalities. For example, achieving a world-class research university requires efforts by all UT colleges; this joint quest justifies for example hiring coordination or the centralization of the labeling of UT\*. Similarly, students in one component will now be able to take courses for credit or even a minor in other institutions. Insufficient efforts by one institution to boost the quality of its programmes, especially, top level programmes, would reduce the attractiveness of the other institutions in the French and international competition for incoming students.
- Increasing economies of scale. The duplication of staff performing the same task in different components represents an obvious waste of resources in a context of limited resources. It also may be a handicap for students who obtain credits in multiple components. Such tasks are optimally centralized.

By contrast, when externalities are limited and centralization does not reduce cost or promote efficiency, tasks are best performed at the decentralized level of colleges:

- Colleges organized around departments will be manageable organizational entities able to design policies that leave little scope for externalities to have negative impact on the rest of UT. It will also be able to raise its own resources through fundraising and through contracting. UT in exchange commits not to expropriate the colleges' effort to raise funds through corresponding budget cuts.
- Colleges will rationalize the research and teaching set-up in two ways: they will do away with duplications and they will reshuffle the landscape into more coherent intellectual entities.
- UT will be a unified university (from January 2016 on actually); to this purpose, it will control the allocation of the budget. Such centralization will simplify external contractual relationships, will facilitate the reallocation of staff and budgets and the streamlining described above, and will reinforce a strong feeling of shared destiny.

### **5.4.2 THE TRANSITIONAL PROCESS 2012-2017**

This ambitious project of having a competitive global university in Toulouse with governance up to the best standards was planned with care and efficacy by the existing institutions that have decided to merge. The plan is structured with the aims of implementing a solid and irreversible governance structure of UT from the beginning of the process, and to immediately create meaningful values for the community from the process itself. This plan has 3 phases prior the merger in January 2018, during which all stakeholders of UT and its members will be consulted (see the "Operational Rules" document for more details).

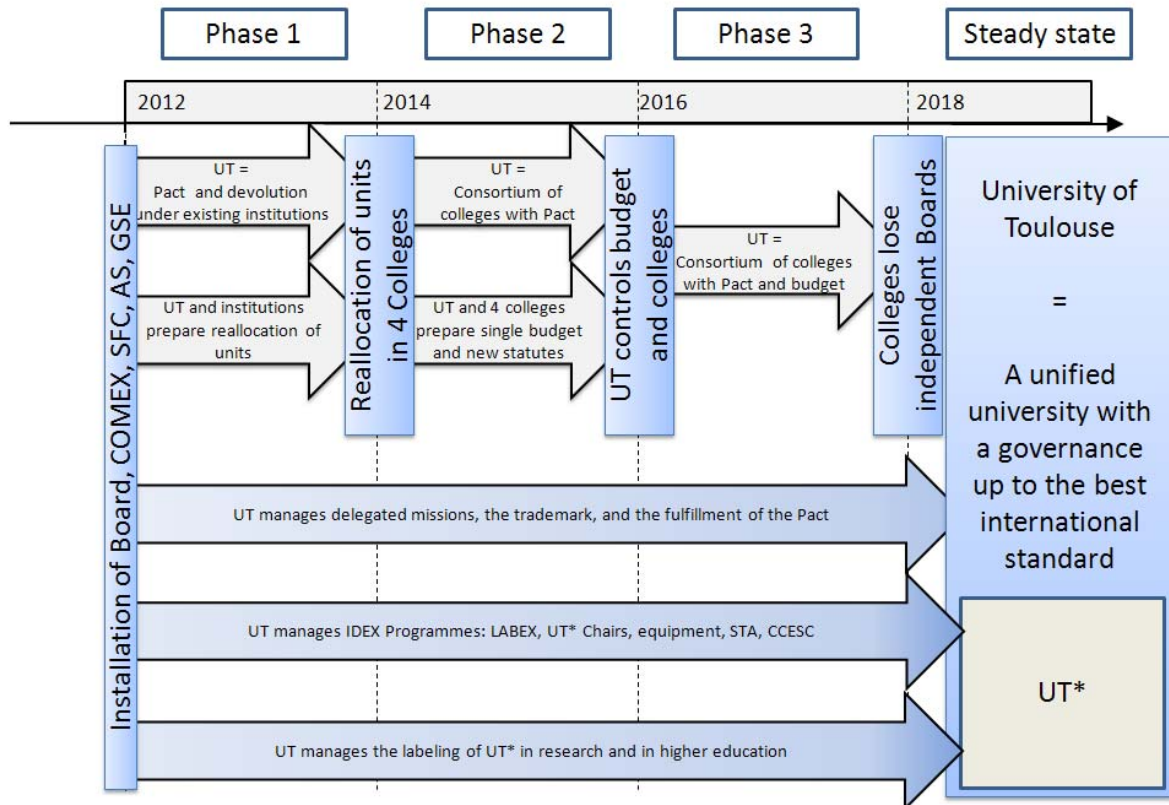


Chart: Unification process for the University of Toulouse

### **Phase 1 (2012 and 2013)**

Only the partners which have signed the Pact are members of UT. The Pact is immediately implemented by them. From early 2012 to the official creation of UT, the governance bodies of the PRES will implement the governance bodies prefiguring UT. For instance, the Founding Board will anticipate the future Supervisory Board, and a project leader aimed at becoming the future Chancellor will be hired.

#### SUMMARY OF TRANSITION BODIES

← EARLY 2013 →	
STRATEGIC FORESIGHT COUNCIL	UNCHANGED
GROUP OF SCIENTIFIC EXPERTS	UNCHANGED
ACADEMIC SENATE	UNCHANGED
FOUNDING BOARD	(SUPERVISORY) BOARD
PROJECT LEADER	CHANCELLOR
GENERAL ASSEMBLY	UNIVERSITY COUNCIL
ENLARGED BUREAU DU PRES	EXCO

The presence in UT's EXCO of leading personalities of the PRES bureau will make this transition easy to manage. The legal installation of the Board of UT implies the suppression of the PRES and the transfer of its remaining services to UT. More missions will be delegated from the existing institutions to UT during the process, with the corresponding transfer of

financial resources and personnel. The Board manages these missions, the trademark, and the fulfillment of the Pact by the members.

The enlarged Bureau du PRES also installs the GSE after a validation by the Founding Board. In preparation of its first campaign in 2012-13, the GSE prepares the Call for Tenders relative to the 4 IDEX Programmes based on a selective procedure (chairs, equipment, STA, CCESC). The GSE also starts working on the evaluation of the perimeter of excellence.

During this period, the members retain their current legal status (University or Grande Ecole). They prepare the transfer of the research units and teaching programmes, sticking to the rule of a single college responsible for each discipline (maths, economics, computer science,...). Small research units at the boundary of two disciplines will be treated in the best interest of the university, and multiple college affiliations of researchers will be considered. The members also prepare a global reorganization of the offer of educational programmes.

Finally, several missions are delegated by partners to UT, with a corresponding transfer of budgets and human capital. The global budget of UT's members was 751 m€ in 2011, from which almost 50 M€ will be transferred to UT in 2012 and 2013. The content and the rhythm of the transfer of devolved missions to UT rely on a rigorous analysis of these missions. The subsidiarity principle will apply to determine the optimal location of responsibilities and means in the three-level structure (UT, colleges, departments). At this stage and notwithstanding further analysis, we have already pointed several missions that can be regrouped as indicated below:

- The means of research: The scientific policy units, the doctoral schools, the PhD contracts and the merit-based bonuses (PES) will be transferred to the UT as soon as it is created: this has important symbolic as well as practical values.
- The international relations policy will also be very rapidly transferred so as to express a single trademark on the global academic market. Concretely, this means that financial means and human capital will be transferred to UT to build its centralized IR department. This UT department will be responsible for several actions (see section 5.3.7). For example, French as a foreign language for foreign students will be managed at UT level.
- Libraries: Library policy is an important item as a tool for students and researchers. UT will centralize the management of the global access to all UT's libraries.
- All actions in favor of the quality of student life that benefit from increasing return to scale will be managed by UT, creating synergies from UT members' rich initiatives.
- Information technologies policies and tools for new teaching methods will rapidly be transferred to UT.

These items are a first indication of the fields that will be transferred to UT. A rigorous methodology will be developed to manage these transfers thus allowing a good adaptation to the aims pursued by UT. UT will guarantee a soft transition for the benefit of stakeholders (students, researchers and staff).

### ***Phase 2 (2014 and 2015)***

In January 2014, the transfer of research units and teaching programmes planned in Phase 1 is implemented. The existing 3 universities retain their current legal structure, but they are relabeled as "colleges":

- UT1 becomes the College Law, Economics and Management;

- UT2 becomes the College of Social Sciences and Humanities;
- UT3 becomes the College of Sciences, Technologies and Life.

The 12 schools of engineering create the College Toulouse Tech (after the suppression of the INP), which will be a “Grand Établissement”. This implies that the “Grand Établissement” UT can be viewed at that time as a consortium of 4 affiliated colleges linked by a Pact, a set of collective missions delegated to the center, a unified global offer in higher education, and virtuous dynamics toward academic excellence under the 5 IDEX Programmes.

During this period, the 4 colleges prepare the transformation of their statutes to become formally an affiliate institution to UT (article L. 719-10 of the “Code de l'Education”, known as “article 43”). At the same time, the EXCO under delegation of the Board of UT starts to negotiate the new “plan quinquennal” with the Ministry.

### ***Phase 3 (2016 and 2017)***

In January 2016, the 4 colleges are formally transformed into academic institutions affiliated with the University of Toulouse. At that time, the UT is a consortium of 4 colleges. The key novelty is that UT is in full control of the global budget of the community. The University Council is created to represent the colleges in the governance structure of UT.

During this period, the boards of the 4 colleges prepare their transformation into Councils of College, and the transformation of their statutes from “article 43” into “article 33” (article L. 713-9). UT’s chancellor or his/her representative will sit on the board of directors of UT colleges. UT will furthermore be entitled with a golden share in each board. This golden share will give UT the power to block decisions that exert externalities on the rest of the UT community and could reduce overall attractiveness: obedience to the Pact (recruitment, multi-disciplinary teaching programmes, ...), member’s change of statutes, or election of its dean for example. Meanwhile, the Academic Senate proposes a reshaping of colleges.

### ***Steady state (from January 2018 on)***

In January 2018, the transformation of the colleges’ statutes is implemented after an in-depth evaluation of costs and benefits by the colleges. The Councils of College are installed, and the Board of UT validates the selection of their deans.

This means that UT has at that time a single -- transparent and efficient -- governance structure with a single Board and a single EXCO chaired by a Chancellor overseeing and controlling the destiny of the whole community of the University of Toulouse.

### **5.4.3 AUDITING PROCEDURE**

In 2012, UT will create a new unit in charge of internal audits, with authority on the entire community. Upon request, this unit will be reinforced by external experts, potentially from the international audit firms. It will be under the direct control of UT’s Board. The Board will periodically assign to this unit a set of specific items to audit: management of HR and of public procurement, control of the image of the University, process under which the ethical code is implemented, budget implementation, etc. This unit reports directly to the Board. In addition to the external certification of UT’s annual accounts, a full external audit of the management and financial systems will be performed periodically on request of the Board, and at least every 4 years. This external audit will be performed by a prominent international audit firm.

## 5.5. MEANS

80% of the budget will be concentrated on the perimeter of excellence, with the remainder being allocated to UT's structural tasks intended to have a knock-on effect on the rest of the site. An "IDEX fund" will be created to earmark this financial resource in the global UT budget. Under delegation from the Board, the Chancellor and the director of research of UT will manage this fund, and will write a "special report" for UT's Board on the activities funded by the IDEX fund.

Below we first describe the nature of spending for the 5 IDEX programmes and the actions co-financed by the IDEX fund in higher education.

### ***Programme 1: LABEX funding***

Total cost: €26M/year including €13M from the IDEX fund.

Part of the IDEX fund will be earmarked to guarantee funding of full-fledged LABEXes beyond the 10 year horizon. Thus the funding of the LABEXes will be made perennial subject to periodic reviews by UT and its GSE that LABEX is indeed making progress toward helping UT comfort its scientific objective.

#### Principle 1: LABEX's overall share

Within the scope of submitted LABEX projects, a share of x% of IDEX funding will theoretically be allocated initially to them. The value of x depends on the capital allocated to this IDEX project by the CGI, denoted CAPIDEX (expressed in millions Euros), in accordance with the following rule:

IF CAPIDEX < 638, x = 50%

IF CAPIDEX > 638,  $x = 50\% - 15.5\% * ((\text{CAPIDEX}/638) - 1)$

#### Principle 2: Reference capital of certified LABEXes with funding

A certified LABEX with funding will be allocated a reference capital allowing it to finance its annual budget allocated by the GCI in a sustainable manner at interest rate 3.41%. Example: A certified LABEX with an annual budget (as certified by the CGI) of 1 million has a reference capital of  $1/0.0341 = 29.3$  million.

#### Principle 3: Actual capital of certified LABEXes with funding

Certified LABEXes with funding can be given a "helping hand" if the total amount of funding described in Principle 2 is less than the overall budget allocated to the LABEXes in accordance with Principle 1. The endowment of capital to funded LABEXes is proportional to their reference capital; the proportionality coefficient gives us a global endowment to the LABEXes in the IDEX in accordance with Principle 1.

#### Principle 4: Evaluating excess amounts

In the case where the aforementioned principles lead us to an allocation in which a LABEX obtains more capital than is necessary to fund its request (cell E14 on sheet A of the LABEX), it must be able to justify this request to the UT's Board. If the Board refuses, the excess capital is made available for other IDEX Programmes of this project.

### ***Programme 2: Permanent Chairs***

Total cost: €22M/year including €11M from the IDEX fund

This programme includes the financial means to be spent to attract highly talented scientists. This includes permanent junior and senior chair positions, temporary chairs and a few postdocs. Depending on the specifics of the field and the needs expressed, these chairs could include additional funds for staff (visiting / fellows / doctoral students / secretary / research assistant) and start-up financing so that the researcher has the initial funds to begin his or her work. The college and national research bodies will provide the job position as well as anything else required such as doctoral students, administration and supplies, so as to share the total cost of the chair equally. Each time a chair is established, the UT will have to earmark the corresponding capital necessary to guarantee that the commitment will be viable on the part of the IDEX fund.

Financial support will be in the range of €60k/year for a junior chair and €120k/year for a senior chair. A budgetary forecast of €11 million/year, say, allocated to chairs by the IDEX fund on an ongoing basis corresponds to 60 junior chairs and 60 senior chairs.

### ***Programme 3: Equipment***

Total cost: €15M/year including €5M/year from the IDEX fund.

These investments include between €100K-and €1M equipment, that can be up to 50% financed by the IDEX fund after an evaluation by the GSE.

### ***Programme 4: Strategic Thematic Actions (STA)***

Total cost: €6M/year including €3M/year from IDEX

The STA will be based on consolidated strategic roadmaps for research and innovation between academic and industrial partners in the three key economic sectors of Midi-Pyrénées Region: (i) Aeronautics, Space and Embedded systems, (ii) Agronomy and sustainable production and processing of agricultural resources and (iii) Bio-engineering and Health. The goal of each STA will be to support multidisciplinary research projects on issues raised by upstream deadlocks identified in their socio-economic sector. The downstream activity will be directly driven by the industrial partners. The proposals submitted in response to STA calls will be subject to specific evaluation committees controlled by the GSE and shall meet the same standards of excellence as those applied to other programmes in IDEX.

### ***Programme 5: Cross-cutting and/or Emergence Scientific Challenges (CCESC)***

Total cost: €6M including €3M/year from IDEX

The aim of the programme is to support both emerging projects and multidisciplinary projects yielding either academic excellence or economic and social impact. The cost covers two types of initiative:

- Search and impulse from the Academic Senate to encourage the emergence of these projects: workshops, courses and seminars;
- IDEX financing of such projects where scientific excellence has been certified by the GSE, including chairs, postdocs, doctoral students and administration.

### ***Education, International and Student Life***

- ***Excellence Bachelor\****: Total cost, €3M/year including €1M from IDEX  
To gradually differentiate students according to their capabilities and aspirations, UT will propose new excellence bachelor degrees. Additional costs include tutorials, administrative and electronic resources to develop internship, additional classes,

organization of research projects and internships in labs or firms, fully international programmes taught in English for a total number of 4,000 undergraduate students.

- **Multidisciplinary programmes:** Total cost, €5.5M/year including €1M from IDEX  
To set-up 10 organized multidisciplinary programmes (3 Bachelor degrees and 7 Master degrees) and at least 15 minor programmes. UT members will cover a large part of these expenses (teaching costs and facilities use). IDEX financing will cover seed financing to develop new programmes, electronic platforms for multidisciplinary learning, recruitment of high quality teachers (academic and practitioners) and dedicated administrative staff.
- **Engineering training programmes:** Total cost, €2.5M/year including €0.5M from IDEX  
To promote actions on the site for all engineering courses around innovation, entrepreneurship, support for common experimental teaching laboratory platforms, administrative and scientific support for the creation of new Bachelors\* programmes in engineering, joint Master engineering programmes between the Toulouse Tech and the STH colleges ...
- **Doctoral programmes:** Total cost, €9.5M including €2.5M/year from IDEX  
To significantly increase the number and level of its doctoral students with a view to meet the challenge of the knowledge economy, UT will strengthen its doctoral programmes through different actions: creation of an *Ecole des Docteurs* with the missions to improve the coordination between the various graduate programmes, to promote and to support graduate students' internships in partnership with top foreign universities, and to develop doctoral skills for the public and private sector for example. The goal is to provide more adequate professional training for doctors so as to better prepare them for their future job. Amendment of doctoral contracts will be financed, to make doctoral studies in UT more attractive, especially in the fields of science and health. The number of PhD contracts will be increased, especially through a financing of excellence PhD programmes within the perimeter of excellence.
- **International appeal:** Total cost, €6.5M including €2M/year from IDEX  
To increase UT's visibility, to attract first-class foreign students and researchers to the site, the following initiatives will be undertaken: the creation of a support unit for major international and European programmes, (Europe +); setting up of permanent international antennas of UT in Asia and Latin America leading to UT international Campus (2016); Master and PhD scholarships for elite foreign students with exceptional promise and outstanding academic achievement; Toul'Box package for foreign students researchers to facilitate all aspects of their integration within the city; language training for master students, doctoral students and researchers.
- **Student life:** Total cost, €4M including €1.25M/year from IDEX  
This task includes two types of initiatives directly beneficial to all students: assistance to students with extra-curricular activities and needs (information, accommodation and culture) and the development of a digital university providing the best services to all users and highly facilitating mobility.
- **Observatory of performances:** Total cost, €1M/year including €0.5 IDEX  
The aim is to create an observatory that will monitor the evolution of site performance indicators and the scope of excellence in four areas: academic scientific

production and valorisation (with the assistance of OST and Thomson Reuters), international appeal, training (integration, quality label) and student life.

- **Scientific prospection:** Total cost, €0.75M/year including €0.25 from IDEX  
The aim is to support scientific prospection and to foster the initiatives of the Academic Senate (both in research and education) so that it can carry out studies and generate activities (workshop, training, seminars).

### ***Contribution from colleges and national research institutions in the transitory phase***

UT colleges and national partners make two strong commitments with regard to supporting excellence:

- Under UT's Pact, the colleges are committed to contribute to the funding of their units in the UT\* via various schemes: optimal reallocation of jobs towards the best performing units, merit-based allocation of PES bonuses, curbing inbreeding, etc.
- The colleges and national research institutions co-finance IDEX Programmes for chairs, equipment, STA and CCESC. For example, they provide the job position for chairs, and the IDEX fund provides an adapted package to the chair, in a 1 for 1 leverage effect. The colleges delegate important missions to UT, with a corresponding transfer of human capital and financial resources.

## **5.6. HUMAN RESOURCES**

The UT project is highly innovative in terms of human resource management. Let's not expand on the details of the Pact related to human resources: prohibition of inbreeding at the junior level, non-discrimination against outsiders, optimal allocation of job positions, merit-based "primes d'excellence scientifique", ...

### ***Tenure track***

The standard recruitment mechanism for junior UT chair-holders will be based on a single labour contract that matches the international standard of an "assistant professor". This scheme will be useful both in terms of clarity of job offers on the international market, and of efficiency of the global incentive scheme for excellence. Admittedly, these researchers will be offered attractive job conditions which implies performance-related advantages. This section describes the contractual arrangement for junior chairs. The main idea is to put in place tenure-track positions provided by the college hosting the chair. This is complemented by a package co-financed by UT which improves the contractual package: equipment, research fund, teaching load reduction, financial bonus. Prior to the merger, these extra elements are paid by the college, which is fully compensated by UT.

Tenure-track junior chair positions are renewable fixed term 3-year contracts (CDD). They are subject to an evaluation for tenure at the beginning of the sixth year.

1. The tenure evaluation is made by the GSE in partnership with the college. The tenure evaluation committee is jointly set-up by the dean of the hosting college and by the chancellor of UT. The evaluation process complies with the best international practices. Comparative letters will be obtained that will benchmark the researcher.
2. When the tenure decision is positive, the junior chair then becomes a senior chair. The initial contractual arrangement is such that the college does its best to transform the position of the tenured chair holder into a status equivalent to an associate



professor (“professeur”). In this case, the constraints differ according to the disciplines. By all means, efforts will be made to guarantee that the positive tenure evaluation will result in a tenured position in the host institution. A different outcome would be a blow to the attractiveness and reputation of UT. UT can act as a guarantee, but only for a limited number of years.

3. When the tenure decision is negative, the contract is not renewed and the employment is terminated.

As explained in the Pact, this system at the junior UT chair level can be extended, on a voluntary basis, to all junior recruitments in colleges on a much wider scale.

### ***Internal attractiveness***

The emergence of the UT as a global player in the international academic competition raises the question of reverse brain drain that is addressed by UT through its programme of chairs. We also need to address the brain drain problem itself. In light of the growing number of excellent researchers in the perimeter of excellence UT\*, one of our challenges will be to retain them in Toulouse. Under the control of the GSE and on a voluntary basis, the colleges can introduce and finance on its own resources a reactive merit-based bonus scheme for its best researchers likely to receive attractive outside offers. The same evaluation norms and methods will be used as those described for the evaluation of chair candidates (external letters, bibliometry,...), using ERC as a model. Prior to 2016, the members of UT will be in charge of financing these bonuses for their own researchers, using the new opportunities offered by the LRU law on this matter.

### ***Facilitating incoming mobility***

According to the Pact, UT and its colleges are committed to adapt the current recruitment process so as to enhance the attractiveness of junior and senior job offers. UT will also create a new service unit whose aim will be to help newcomers overcome the numerous obstacles inherent to mobility. As for recruitments for international chairs, two people – one from the service staff and an academic mentor- will be designated: they will have to make sure that incoming mobility runs smoothly. This support will be initiated as soon as the recruitment decision is made, and will continue until six months after the scholar’s move to Toulouse. It will consist in an interview of the newcomer by the employer, in drawing up a detailed list of his/her family’s requests. This service will be comprehensive, ranging from immigration documents writing, housing and schooling assistance, spouse/partner coaching on the labour market, and if needed, access to high-quality French courses.

## 6. KEY DATA AND FINANCIAL PLANNING

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

Tableau 1.1	Excellence perimeter	All partner institutions of the Idex
<b>Number of academics <i>Target 2016</i></b>	<b>2 000</b>	<b>6 520</b>

Tableau 1.2	Idex training programs students	All Idex partners students
<b>Number of students <i>Target 2016</i></b>	<b>20 000</b>	<b>94 000</b>

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

Capital grant requested	1 340.50
Yearly expected interests from the capital grant (based on a 3.413% rate)	45.75

**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).**

Action	Ressources				Spending		
	Idex grant	Other grants related to « Investissements d'avenir »	Contributions of all partner institutions of the Idex based on their own budget	External resources	Investments including real estate	Operating costs	Staff
LABEXes	52		52		30	33	41
Chairs	44		36	8		18	70
Equipment	20	113.50	20	20	163.50	10	
STA	12		8	4		10	14
CCESC	12		8	4		9	15
Excellence Bachelor*	4		8			6	6
PhD Excellence Grants Programme	4		20			3	21
Overhead costs	2.8					0.7	2.1
Other financing for the perimetre of excellence			1 153.46		120	146.96	886.505
<b>TOTAL</b>	<b>150.80</b>	<b>113.50</b>	<b>1 305.46</b>	<b>36</b>	<b>313.50</b>	<b>236.66</b>	<b>1 055.60</b>

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

Action	Ressources				Spending		
	Idex grant	Other grants related to « Investissements d'avenir »	Contributions of all partner institutions of the Idex based on their own budget	External ressources	Investments including real estate	Operating costs	Staff
Multidisciplinary training programmes	4		18			4	18
Engineering	2		8			5	5
« Ecole des Docteurs »	6		9	9		5	19
International appeal	8		12	6		10	16
Student life (and digital University)	5		8	3		12	4
Obs. of performance	2		2			1	3
Scientific Prospection and events	1		2			1	2
Overhead Costs	4.2					1	3.2
IRT		100		190	120	160	10
SATT		28	4.9	2.5	0.7	15.2	25.5
TWB-Synthacs		11.50	4	4	7.02	5.07	7.41
Other programmes		95		90.5	50	20	20.5
<b>TOTAL</b>	<b>32.20</b>	<b>234.50</b>	<b>67.90</b>	<b>305</b>	<b>212.72</b>	<b>266.27</b>	<b>160.61</b>

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

	Resources mobilized for the actions of the Idex project	Total of the resources of the Idex partners
<b>Financements apportés par les Investissements d'avenir (A) et (B)</b>		
<b>Investissements d'avenir : amount of the requested funding for the Idex (A)</b>	<b>183</b>	Sans objet
<b>Other fundings within Investissements d'avenir which could affect the Idex (B)</b>	<b>348</b>	Sans objet
Funding obtained (b1)	<b>286</b>	Sans objet
Pending fundings (1st and 2 <sup>nd</sup> wave) (b2)	<b>62</b>	Sans objet
<b>Contribution of the higher education Idex partners (C)</b>		
<b>Université Toulouse 1 Capitole</b>	44.60	350
<b>Université Toulouse II le Mirail</b>	64.48	655.60
<b>Université Toulouse III Paul Sabatier</b>	403.52	1360
<b>Institut National Polytechnique de Toulouse</b>	71.40	259.2
<b>Institut National des Sciences Appliquées</b>	38.80	129.2
<b>Institut Supérieur de l'Aéronautique et de l'Espace</b>	23.60	206
<b>Total</b>	<b>646.40</b>	<b>2 960.40</b>

Contribution of the research institutes within the IDEX partners (D)		
<b>CNRS</b>	470.80	1 120
<b>INRA</b>	52.28	216
<b>INSERM</b>	61.28	616
<b>IRD</b>	30.6	40
<b>ONERA</b>	100	200
<b>CNES</b>	12	
<b>Total</b>	<b>726.96</b>	

Contributions of other partners (E)		
<b>xx</b>		
<b>Total</b>	<b>(e)</b>	

Contribution of the territorial authorities (F)		
<b>Conseil régional Midi-Pyrénées</b>	97	
<b>Communauté Urbaine du Grand Toulouse</b>	67	
<b>Total</b>	<b>164</b>	

Contribution of the private sector (G)		
<b>Groupement IRT</b>	169.50	
<b>Total</b>	<b>169.50</b>	

Other contributions (H)		
<b>Fondations</b>	<b>7.5</b>	
<b>Total</b>	<b>7.5</b>	

TOTAL (I)		
<b>TOTAL</b> of the resources mobilized for the actions of the Idex project	<b>2 245.36</b>	Sans objet



**Table 6 : Distribution of the expenses according to the nature of the 4 year budget (in millions of euros)<sup>1</sup>**

	Requested funding for the Idex	Resources mobilized for the actions of the Idex project
HR (including permanent staff)	138.90	1216.21
Equipment	16.20	526.22
Operating costs	27.90	502.93
Total	183	2 245.36

---

<sup>1</sup> (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

**Table 7 : Distribution of the expenses by activity of the 4 year budget (in millions of euros) <sup>2</sup>**

	Resources mobilized for the actions of the Idex project	Resources mobilized for the Idex project
Research	141	2 045.46
Training	28	118
Development of results and relations to the economic sphere		54.90
Governance	9	11
Campus life	5	16
Other		
<b>Total</b>	<b>183</b>	<b>2 245.36</b>

---

<sup>2</sup> Idem :  
(a'') = (a') = (a)  
(i'') = (i') = (i)