CHANGE INTO THE FRENCH SYSTEM OF RESEARCH AND WORLD-CLASS UNIVERSITIES

New policies targeted towards more “coopetition” within an “old” Scientific System
(Short term evaluation for a long term issue)

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A COMPREHENSIVE AGGIORNAMENTO OF A NATIONAL SYSTEM OF RESEARCH AND INNOVATION

- Science policy: we consider the university system at large, including research, higher education, and university third mission (from fundamental research to innovation).

- A National System of Research and Innovation is “the network of institutions in public and private sectors whose activities and interactions create, import, modify and diffuse new knowledge and relevant new technologies” (from Christopher Freeman 1980).

- World class universities (or research universities?) are necessarily a key element within the “System”
AN OLD NATIONAL SYSTEM of R/I

- Fundamental Research and innovation are a key component of the national identity (military + industrial + political goals ... + science)
- National specialised bodies: CNRS (National Centre of Scientific Research, created in 1939), CEA (Centre for Atomic Energy, 1945), INRA (Agricultural Research, 1946), CNES (Space research, 1961), ÎNSERM (Medical Research, 1964) and other ...
- Research is financed by State according to scientific fields more than to targeted projects. Researchers are hired at the national level as civil servants. Tax payers’ money finance each scientific body, through a global negotiation process at the level of each institution (4 years contracts)
- 20 major national corporations (Elf Aquitaine, EDF, CEA, Renault, EADS, Sanofi-Aventis, Dassault, L'Oréal, Matra-Lagardère, Michelin, Saint Gobain) execute and finance about 80% of private R/D and own 40% of the patents
- The relations between state, research, and industry are tight.
- \( \Rightarrow \) strong but fragmented public research system
STRONG RESULTS

- **Well developed national system of higher education and research** (even through Rankings). Strong results in specific fields such as in Physics (the CNRS has been funded by the Nobel Price Frederic Joliot Curie; 2007 Nobel Price Albert FERT) and Mathematics.

- **Wide set of audacious Innovations** in fields and projects where complexity required strong coordination: Telecom (1967), Aerospace (Caravelle 1960, Mercure 1968, Airbus 1969, Ariane 1973, Mirage), Medical research, High Speed Train (1977), and atomic energy (Nuclear Superphénix 1970-73). All these major innovations were related to public decisions.
STEADY HANDICAPS AND PRESENT CHALLENGES

flexibility, cooperation, competition, money

Complexity of R/D system:

- 85 Universities,
- 10 EPST (CNRS, INSERM, INRA, INRETS, CEMAGREF...)
- 10 EPIC (*Etablissement Public Industriel et Commercial*) (CEA for Atomic Energy...)
- 20 “*Grandes Ecoles*” X Polytechnique, ENA the National School for Administration, ENS, Centrale, Mines, Ponts & Chaussées...
- + 20 large corporations execute 92% of the private R/D

Administrative rigidities: National government remains strongly at the centre of the national system for strategic and for day to day issues. Almost no incentive for the best researchers. Rigid way to hire people and to manage the institutions
MAJOR INITIATIVES AND POLICIES

2005-2007

- **A slow, but continuous change** (France passed from 70% of its R/D paid by the State in 1970 to 44% today)
- + the **quadruple shock in 2004 - 2005**

1. Individual and collective revolt of researchers (1500 directors of Labs publicly resigned; april 2004)
2. Large debate on the relations between fundamental Research, Technology and Innovation (Fundamental research and business)
3. Political disturbances (dissolution of the national Assembly in 2004 and regional elections where the political opposition won 20/21 French Regions)
4. Shock of the European referendum, May 2005

- **The rationale of the new French Science policy** 2005-2006
  - To introduce open **competitive research process through projects**, 
  - To restructure the location of research and reinforce geographic **clusters of research**
  - To introduce an **a posteriori evaluation** (instead of an a priori evaluation) (LOLF and its indicators)
  - Still open answers to the national rigidities (**management of human and financial resources** even when we talk about “autonomy”)
  - Still open answer about the **Concept of « excellence »** (variety of World Class concepts)
### 4 levels to implement Science Policy

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<th>Level</th>
<th>National</th>
<th>Regional</th>
<th>European</th>
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| 1- Global priorities (policy level and evaluation) | **HCST (+CSRT)**  
DGRI (military)  
**AERES**  
LOLF | Vice presidency « research »  
Regional plan for Eco. Dev. and Education | ERA - ERC  
MOC  
PCRDT - FP7 |
| 2- Scientific priorities (programs level) | **ANR and AII**  
+ Universities & Institutions, Great Schools, Space, military  
Under 4 years contracts | Reg. Scientific Council  
**CPER** | PCRDT - FP7  
ERA-NET  
ERC |
| 3- Management level | **PRES**  
Pôles  
RTRA  
Carnot | **PRES**  
Pôles  
RTRA  
Carnot | NoE  
Eureka |
| (4- Laboratories and their researchers) | + the “Réform” of Universities + Scient. Institutions + Great Schools + OSEO, Space Agency, DGA | | |
A REFORM THROUGH NEW INSTITUTIONS (added to the existing ones)

- The National Agency for Research (ANR)
- The Agency for Industrial Innovation (AII)
- The new “National” policy has strong Regional and European implications:
  - **PRES** (Pole for Research and Higher Education... The Shanghai Syndrome or new cooperation between institutions? (André Singanos: size is artificial)
  - **RTRA** (Networks for world-class research : Réseaux Thématiques de Recherche Avancée)
  - **Competitive Industrial Clusters** (Pôles de Compétitivité)
  - **Carnot Institutes** (PPP Labs with strong and long lasting relations with the industrial business)
NEW FUNDINGS

Competitive funding (M€ yearly 2006)
RELATIONSHIP BETWEEN OLD AND NEW FUNDING (M€ yearly 12%)
TERRITORIAL IMPACT OF UNIVERSITIES IN THE COUNTRY AND THEIR POSSIBLE EVOLUTION
(As it was perceived in June 2007)
EVALUATION

Immediate results:

- National goals were clear and obvious
- New money (1.5 to 2.5 Bil €)
- Researchers approved the initiatives and applied massively to the new programmes presented within the call for tenders
- The management of this new system appeared to be satisfactory from the first year or two

- Reinforcement of local initiatives.
- Open hierarchy within research and between research groups (World-class; toward world-class; national, regional...)
- Concentration of resources on a limited number of competitive locations (critical mass)
- Provide to the institutions recognised as « the best » an obligation of results - But what to do with the « non best research » locations, organisations and people?
ONGOING INITIATIVES
AND FORTHCOMING CHALLENGES

- The reform of universities
  - Major sources of scientific research and higher education
  - No selection
  - National regulation for curricula, employment, money spending, real estate...

- Autonomy and governance
  - Autonomy
  - National regulation with more flexibility
  - New modes of management (evaluation, decision, implementation and monitoring)

- We shall bring non university research into University (Pr. Philip Albach)?

- Shall we bring higher education research into University?
  - Identify the respective roles and capabilities
  - No duplication
  - New cooperation
NEXT ISSUES FOR RESEARCH and HIGHER EDUCATION POLICY (no answer)

- **To fuel the management regulations and capabilities** (human resources, finances and real estate)

- **To increase of public funding** must continue (the average funding of higher education remains lower than in competing countries)

- But **the gap is much larger for private funding** of research (1,1% of GDP by private against 1,67% Germany 1,87% US and 2,36% Japan)

- Higher education and research **for free** and the **no-selection within university** are going to end