Networks and Clusters: initiatives for a knowledge based economy in France

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Research in France

- **GNP**: 1463 billion euros
  R&D budget: 32.5 billion euros
  R&D: 2.2% of GNP (2.9% in Japan)

- **Public research**: 165 establishments of higher education of which 85 universities, about 60 research institutions, 320 000 research personnel (of which 56% in companies).

- **Companies**: participate at the level of 54% in public research expenses (compared with 66% in other countries)
  In 2000, more than 5000 companies and industrial technology centers have carried out R&D.
Innovation

• “Innovation is to create value out of new knowledge”

• “Research and innovation are two fundamental levers because they favour economic growth, employment creation and social progress in the interest of all”

(Claudie HAIGNERE: Press Conférence - Innovation Plan
11 December, 2002)
The Law on innovation and research of 12 July 1999:
measures aiming at
• - Allowing researchers to create a company on the basis of their own research or to be associated with (company decision making)
• - Developing partnerships between public research and industry

An observation, an objective: in France R&D = 2.2% of GNP, according to the European Council decision it has to reach 3% before 2010 = that means industry must increase its share

2002 – 2003 an innovation plan, a new law debated this Spring.
National and regional initiatives

• **A national policy**
  Characterized by the creation of thematic partnership networks between public research and industry, by the synergy of means and the emergence of large clusters of competence.

• **Regional support**
  Regional clusters are supported by local authorities in the framework of State-Region 6 years Programs.

• **A European ambition**
  Facilitate the access of French research to the 6th framework European R&D programme.
Two complementary approaches

• **1- Spread innovation** in SMEs and promote the creation of start ups as a result of public research.

• **2 - Structure research** according to big priority areas with the help of national networks and regionally located competence clusters associating private and public partners.
Spread innovation in SMEs support structures

In each Region

• Shared technological facilities:
  – Plates Formes Technologiques

• Regional Centers of Innovation and Technology (CRITT) and Centers for technological resources (CRT)

• Coordinated by Technological development networks (ANVAR French Agency of Innovation, Region, DRRT)
Spread innovation in SMEs
Incentive measures to create start-up

- **Start-up creation Prize** (each year since 1999 – State support: 76.22 M €)
- Support to **start-up “public” incubators**: 31 created (at least one in each Region) - State support: 24.64 M € for 3 years (x2 Terr.Coll)

**Results** from 1999 to 2002:
- Creation of 850 start-ups and 3150 jobs
- **10 seed funds**, among which 7 are regional funds (State: 23 M €)
Structure research

Private and public partnerships

From a national to a regional level

• National Technological Research and Innovation Networks (RRIT) on priority fields
• National Centers of Technological Research (CNRT) regionally located
• networks of local centers

Case studies in two R&D domains:

ITC and Life sciences
Technological Research and Innovation Networks (RRIT)

A national initiative

• to merge research teams from the public and the private sectors
• on mainstream S&T themes (ITC, life sciences, energy-transport, environment, space and aeronautics..)
• in response to strong demands from economic world
• Year calls for proposals with priorities.

From 1998 to 2002:
16 networks created, more than 700 projects selected
RRIT: 16 Technological Research and Innovation Networks

• Information Technologies and Communication (TIC)
  – RNRT (1998):
    Telecommunications
  – RMNT (1999):
    Micro/nanotechnologies
  – RNTL (2000):
    Software Engineering
  – RIAM (2001):
    Audiovisual/Multimedia

• Bio-engineering:
  – Génoplante (1999)
  – Genhomme (2000)
  – RNTS (2000):
    Healthcare Technologies
  – RARE (2001):
    Alimentation
RRIT: 16 Technological Research and Innovation Networks

- **Energy, environment, transports, resources...:**
  - PREDIT (1996): Transports
  - PACo (1999): Fuel Cells
  - Civil and Urban Engineering (1999)
  - RNMP (2000): Materials
  - RITEAU (2000): Water and Environment
  - RITMER (2001): Accidental marine Pollutions

- **Space and aeronautics:**
  - RTE (2000): Earth and Space
The National Centers of Technological Research (CNRT)

- **Center**: a local “nucleus” associating industrial partner(s) and public research, complemented by a national network of labs

- **National**: a national quality stamp (label)
  
  State and Regional funding within the State-Region Framework program

- **Technological Research**:
  
  - Research: partly “academic” and oriented towards publication, partly applied and oriented towards patents
  
  - Technological: research priorities are chosen by the industrial partner(s)
Networks and centers

1 in Life sciences
- RRIT Genhomme
- Evry Genopole (CNRT)
- Network of genopoles (genomics clusters)

2 in information technologies
- RRIT : telecommunication (RNRT)
- CNRT of Tours
- Network of Major Technological Platforms in micro and nanotechnologies
Genhomme Network

• Created in June 2000
• A public and private partnership : 93 members
• A Scientific Council chaired by the Director of the Lille Genopole and an Orientation Council chaired by the CEO of a private company
• 300 millions euros over 5 years (State/Private 50%)
• To date : 78 projects labelled
• related to Genomic infrastructures : national genomic platforms in Evry, the network of Genopoles
National Network of Genome Centres (regional genopoles)

- Part of a National Genomic Program

- a national call for grants for the construction of a limited number of genomic centres in France
- each regional genopole consists in a scientific project, a university program, business development tools (support biotech companies)
- 8 genopoles
Evry Genopole

- A Biopark associating public and industrial research
- Supported by Private and Public Organizations (French government, territorial collectivities and AFM)
- Created in 1998
- 22 research labs
- 734 people
Evry Genopole

• **A scientific campus**: National Sequencing and Genotyping centres, French centre for bio informatics, the Plant Genome Network (RRIT), Genethon lab

• Affiliations with national research institutions: CEA, CNRS, INRA, INSERM.

• **A University program**:
  • Undergraduate courses in life sciences
  • Doctoral program in genomic
  • High level management courses
  • Master program in bio informatics
Evry Genopole

Genopole enterprises

• A business incubator dedicated to biotechnology
• Genopole pre-seed Capital fund (1.2 M €, 15 private investors)
• Results in 4 years: 40 biotech companies

Genopole Europe

• Participation in the 5th and 6th FPRTD
• Consortium with European bioparks (UK, Germany, Italy): toolbox of the best practices for creating a biopark
information technologies

three examples:

The National technological research network on telecommunications (RNRT)
The National Center of Technological Research of TOURS
The network of major Technological Platforms in micro and nano technologies
The National Network for Research in Telecommunications (RNRT)

RNRT is a network

- It supports the animation of the scientific and technical telecom community through:
  - thematic calls for proposals
  - working groups and reports on trends and issues in the domain
  - thematic workshops
  - an annual meeting (with lectures and posters sessions)
The National Network for Research in Telecommunications (RNRT)

- RNRT issues yearly calls for proposals with priorities
- RNRT supports three types of projects: precompetitive, exploratory, test-beds
- All projects must identify scientific, technological and business perspectives
- Public funding is granted by Ministries in charge of Research and Industry
The National Network for Research in Telecommunications (RNRT)

- **200 projects have been labelled in 5 years**, 
  - 390 M € R&D programs, 194 M € public funding
  - more than 2700 man.year involved over 5 years
  - about 40 telcos and manufacturers, more than 100 public labs and 120 SMEs
  - New actors keep joining the network

- **Project results are very positive** (spin-offs, contributions to standards, publications, patents…)
  - Presently, 60 projects are carried out
CNRT of Tours
Power microelectronics

• **A Centre : located in Tours (Pays de Loire)**
  - Industrial partner : ST Microelectronics Tours (1500 people)
  - Academic partners : François Rabelais University of Tours, National Center for scientific research (CNRS) and Atomic Energy Commission (CEA) laboratories located in Tours

• **...and a National network of 13 public laboratories** (CEA, CNRS, Universities) located in Grenoble, Strasbourg, Toulouse, Rennes, Marseille, Limoges, Orléans
CNRT of Tours
Power microelectronics

• an agreement signed between the University of Tours, the CEA and ST Microelectronics
• Staff: 50 people in Tours, 30 elsewhere
• A director, a Scientific Council, a Steering Committee
• A technological platform with 100 clean rooms dedicated to research
• Budget: 31 M € (State, Region, Department, City of Tours: 25% each + ST Microelectronics: 68%)
Network of Major Technological Platforms on micro and nano technologies

- Creation of a national network of regional Major Technological Platforms,
- complementary and competitive on an international level
- to develop most advanced and integrated processes in micro nano-technologies.
Network of Major Technological Platforms on micro and nano technologies

Four regional Major Technological Platforms

- PLATO of LETI-CEA in Grenoble, in the core of MINATEC Project.
- Platform of LAAS in Toulouse
- Platform of IEMN in Lille
- one platform on two sites in Ile-de-France: the Laboratory of Photonics and Nanotechnologies in Marcoussis and the Institute of Fundamental Electronics in Orsay (in the core of « Minerve + » Project).
Network of Major Technological Platforms on micro and nano technologies

- One steering Committee in each cluster

- One national coordination committee

- One evaluation committee (national and foreign experts from academic and industry sector)
IEMN Lille

Marcoussis/Orsay

LETI Grenoble

LAAS Toulouse

platforms
1: Smart devices building (BOC) => click to enlarge
2: Advanced components building (BCA), CEA laboratories => click to enlarge
3: Advanced components building (BCA), INP Grenoble laboratories => click to enlarge
4: High technology building (BHT) => click to enlarge
5: Maison des Micro et Nanotechnologies (MMNT) => click to enlarge
6: INP Grenoble building (engineering school) => click to enlarge
7: Existing CEA-Leti laboratoires => click to enlarge
• **Grenoble-Isère**: 17,000 jobs in scientific and academic research, 200 laboratories and five international research centers, 53,000 students and 10 engineering schools

• **a powerful local microelectronics industry**, comprising 13,350 workers (including 3,000 in research), 30 international corporations, and 20 high-potential start-ups launched in the last five years

• **Crolles**: Alliance between three industrial groups: ST Microelectronics, Philips and Motorola

• **decisive support of local authorities.**
Minatec

All the elements of innovation on one site:

TRAINING
INPG

RESEARCH
CEA, CNRS, Universities

COORDINATION
The House of Micro and Nanotechnologies
(resource center: links with RMNT, CNRT, European networks)

INDUSTRIAL VALORISATION
Sophia Antipolis technopole
www.sophia-antipolis.net

Scientific Park: 2300 ha  24 550 jobs  148 companies

Higher education and research
4 000 researchers in more than 50 institutions (CNRS, INRA, INRIA, INSERM..)
5 000 students (UNSA, ENSMP, ESIEE, ESSI, Eurecom Institute, EAI Tech..)

Support of PACA Region, Alpes Maritimes Department, State
Sophia Antipolis technopole

Three domains

• Health sciences
• Geosciences
• Computer sciences, electronics, networks and communication

CNRT Telius (research on ITC uses)
A large project in 2004: creation of a Campus on information sciences and technologies (PACA Region/State)
New French Plan for innovation

• reinforce private companies’ participation in R&D (eg: better fiscal conditions for start ups ..)
• increase market-orientation and valorisation of public research investments (eg: evaluation chart, technology transfer best practices, promote business culture in universities..)
• promote French participation in European Research Space (eg: European cooperation between networks, Community Patent)