

**CEA**

**Division of Technological Research**

# **CISTRANA Workshop**

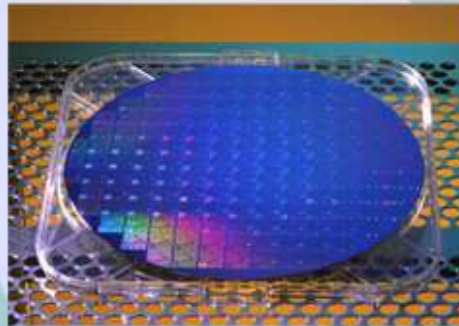
**The French Pole de competitivite  
The case of Grenoble**

**Dominique Grand**

Deputy Director CEA Grenoble

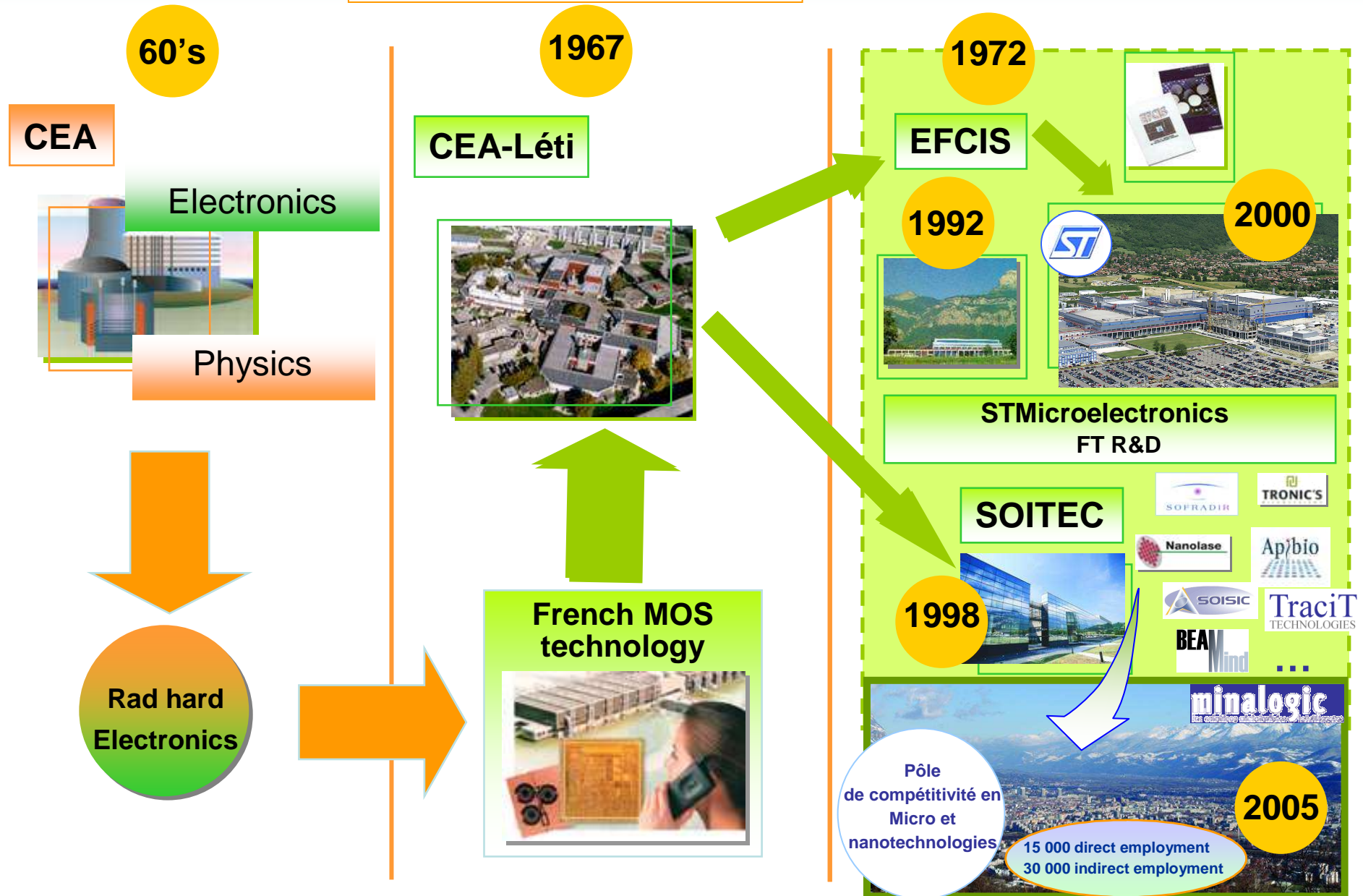


# From a laboratory to a pole of excellence



# Development of microelectronics in the Grenoble cluster

Over 40 years of history





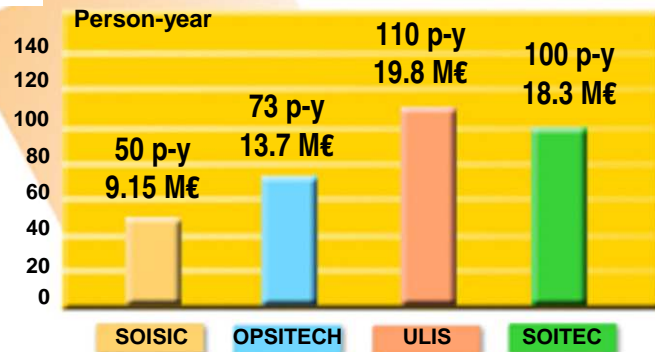
# LETI: a bridge between fundamental research and industry

## Micro-nanotechnologies and their integration in systems

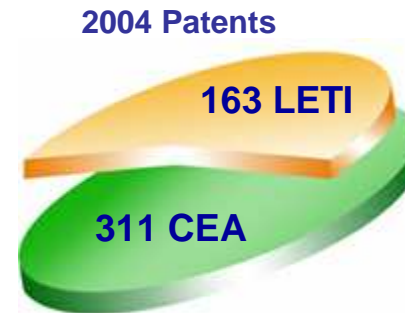


# Innovation and industrial exploitation: Start-ups

## Investment in manpower



## Patents

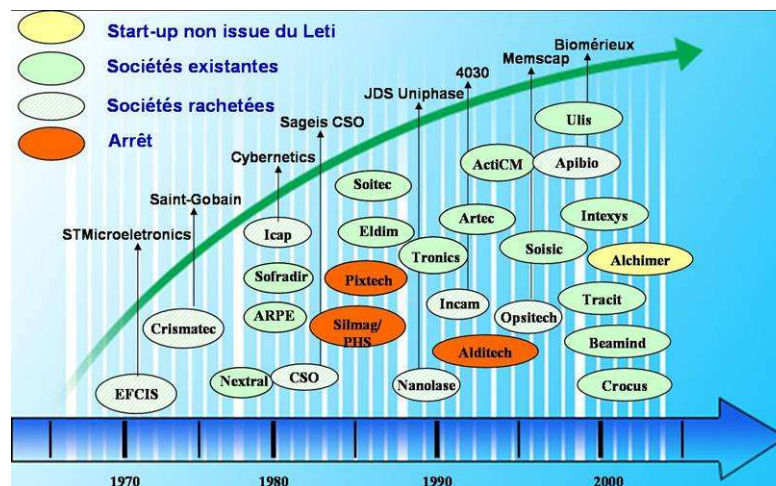


CEA : 4th rank among French companies for patent filing in France

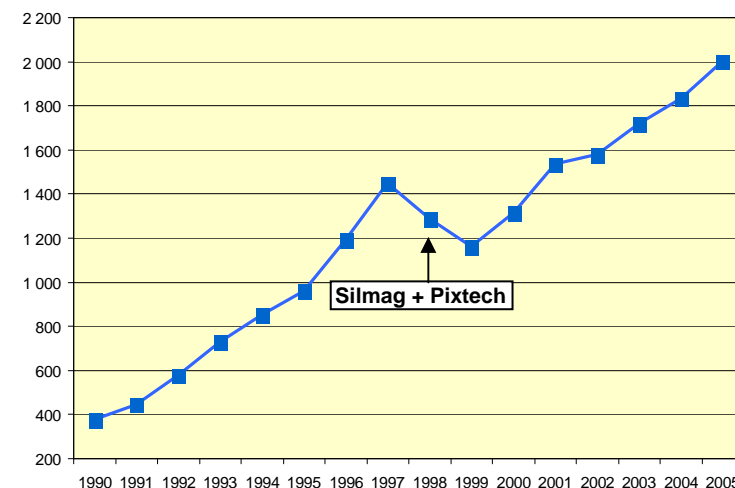
## Support for setting up start-ups

- Spin-off
- Incubator (GRAIN), CEA-Valorisation Seed capital (EMERTEC),
- Providing location
- R&D agreement

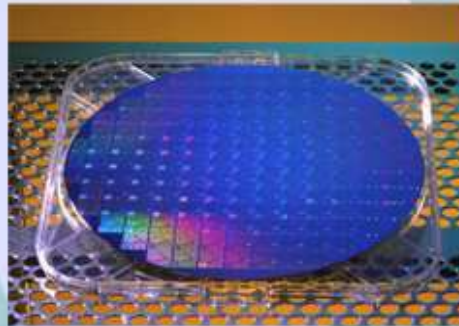
## Start-ups



## Overall employment created



# From **LETI** model to **MINATEC** model



# The MINATEC Innovation Centre



## Pole

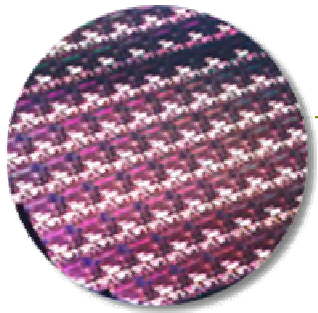
**Assemble technological means and scientific competence**  
a center for excellence and a model in Europe



## Innovation

**Objective :**  
**industrial exploitation of innovation**  
creation of sustainable jobs:

- on the local level
- on the national level



## MINATEC

**Thematics : micro & nanotechnologies**  
miniaturized devices for the public :

- microelectronic chips
- flat panel displays
- optical storage devices CD, DVD
- optical microsystems and nanophotonics devices
- biochips

...

**4000  
people**

# MINATEC: a hub for education, research and industry

## Education INPG

1,000 students  
Staff of 500



- Attracting young talent



- Teaching skills for the future



## Research CEA-LETI

1,500 employees



- Promoting inter-disciplinarity



- Encouraging creativity



- Accelerating the innovation process

**Service Organization**  
100 employees

## Industrial applications

Services for public & private organizations  
1,000 employees



- Creation of long-term employment



# MINATEC: the partnership

## A project leading to cohesion

**Total  
170 M€**



	32.32 M€
	38.50 M€
	13.48 M€
	23.47 M€
	9.90 M€
	9.90 M€
	1.52 M€
<b>+ private</b>	

Loan for constructing the High Technology Building except (24 M€)  
DFT except (17 M€)

# MINATEC a bridge between learning, research and development

## The MINATEC Innovation Centre



**Technology  
transfers  
to industry**

**DFT** Elyo  
*Facilities building*

**Research  
CEA-LETI – INPG**



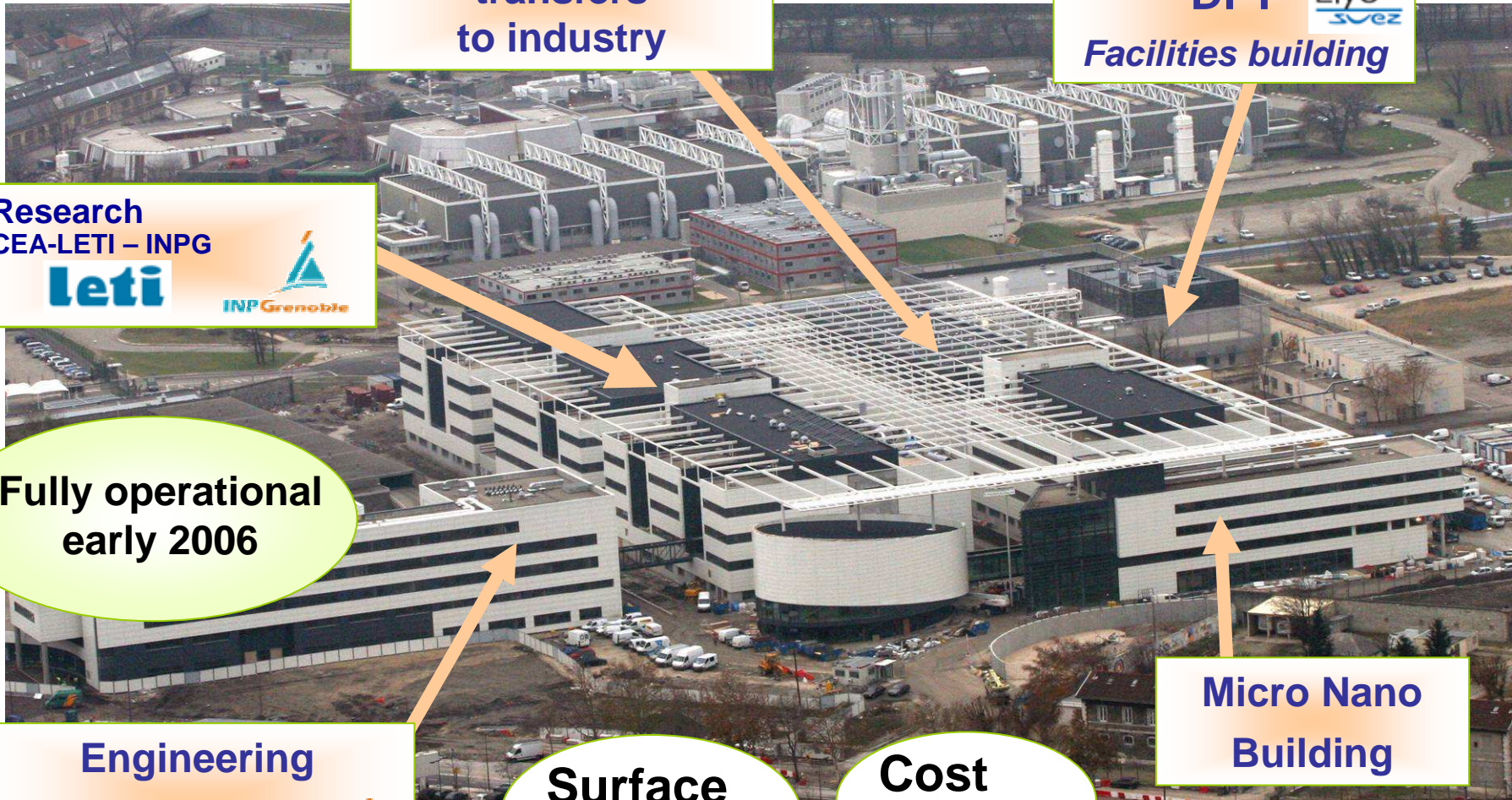
**Fully operational  
early 2006**

**Engineering  
school**  
INPG INP Grenoble

**Surface  
45 000 m<sup>2</sup>**

**Cost  
170 M€**

**Micro Nano  
Building**





# The MINATEC Innovation Cluster



# Integration of MINATEC in the Grenoble Science District

A technopole in the city





# Crolles 2 Alliance : ST Microelectronics/Philips/Freescale



## Investments

2,8 B€

543 M€ (Regional, Local, National)

**Crolles2 Alliance**



## **Pôles de compétitivité**

- **Christian Blanc report to the French Prime Minister  
« For an ecosystem of growth » November 2004**
  - **Questions on the competitiveness of French economy. International benchmarking.**
- **Characteristics of competitive countries:**
  - **Develop high technology industries - IST, biotechnologies, telecom- with fast growing markets**
  - **National economy stimulated by some regions**
  - **Leading regions organized around a technological cluster (industry, education, research)**

## Recognition of the Grenoble competitiveness cluster

- **An economic model**

## Christian Blanc confirms his vision of Grenoble as a model for success

**Christian Blanc :**  
"Mon modèle  
économique,  
c'est Grenoble"

**GRENOBLE.** Pour le député des Yvelines, qui s'exprimait hier soir devant le club INPartners, les futurs pôles de compétitivité en France, préconisés dans son rapport au Premier ministre, devraient imiter l'exemple de "cluster" technologique à la grenobloise.

● EN PAGE 6,  
L'ARTICLE D'OLIVIER PENTIER

## “Mon modèle économique, c’est Grenoble”

**BRUNOUILLE.** Pour le député des Yvelines Christian Blanc, la capitale des Alpes a valeur d'exemple de ce que devraient être les pôles de compétitivité préconisés dans son rapport remis au Premier ministre. "Je veux savoir quelle carte d'identité, à vingt ans, vous souhaitez vous confectionner"...

**J**'ai plaisir à vous rencontrer à l'été 2016. Après une semaine, elle sera terminée. Ensuite, il faut attendre pour la fin de l'année.

**A**

[illegible]

...and the ...

to maintain, to maintain small schools is to privilege the philosophy of small over the support of the large. It is to create a hierarchy of knowledge and to maintain that hierarchy.

[illegible]

Christian Blume: "Fast ist in München. Bayern: alles wird in München: nur das ist es."...

Enfin, à quelques jours de l'entrée des Allems italiens dans l'Etat phénicien de la recherche, à Jérusalem, il a annoncé le « cas » : « Les monastères de Maronites (1) dans des conditions de l'histoire (2) sont les seuls qui ont pu survivre au monde. Les autres ont été détruits. »

— (7) Précédé par Christian Seux, 2-02-81. Maurice Dumas est devenu président de la Fédération Française de Hockey en 1982.

**" Il faut remettre  
de l'ordre dans  
le gouvernement  
des universités "**

tes. Il faut cependant que l'ensemble des données de la culture soit accessible dans un cadre d'analyse systématique, avec des modalités, des critères de hiérarchisation, ou grandes finalités de l'analyse globale sont bien représentées (1, 2, 3). Quant à la Bioéthologie, il serait intéressant que les transformations les plus récentes soient la référence aux organismes comme la CHM, l'INRA, l'INRA, ou l'Institut National de la Recherche Scientifique.

# Pôles de compétitivité

- Call for projects from the French Government September 2004. Develop bottom-up initiatives.
- 105 submissions
- Selection on July 12 2005:
  - 67 projects selected
  - 6 worldwide: 2 in Ile de France, 2 in Rhône-Alpes, 1 in Provence Alpes Côte d'Azur, 1 in Midi Pyrennées.



# **Pôles de compétitivité: motors for growth and employment**

## **Cluster of players :**

- **living in the same area**
- **working in a specific economic domain to permit synergy**
- **combining industry, public research and education**

**Objective: maintain jobs in the region.**

**Delocalization of a cluster (a pôle de compétitivité) is more difficult than delocalization of a factory.**

Accepted “world class” project - 12 july 05

# M **INALOGIC**

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**Micro NAnotechnologies et LOficiel Grenoble-Isère Compétitivité**  
Intelligent and Miniaturized Solutions



**Grenoble - Isère**

# Miniaturized and intelligent products: a source of industrial competitiveness

## Challenge :

to move the battle from a playing field based on production cost to one based on innovation and value added to products and services

**Large volume products become « commodities »**



Agressive competition from low production cost countries  
Quickly copying new products

**The European Industry must bring a dual response**



Differentiation of products:

**Miniaturisation**  
**Intelligence and communication**

Launch innovative products more quickly

Creation of new services (and jobs) around these products

# Objectives of MINALOGIC



**Strengthen the core activity : micro nanotechnologies**

**Bring new functionality to devices integrating  
embedded logic**

**Access « traditional » industries**



# Public research and industrial jobs in IST in Grenoble region

## Micronanotechnologies



Public research	2 100 jobs
Companies	14 500 jobs
<b>TOTAL</b>	<b>16 600 jobs</b>

Education	1 800 students
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## Software



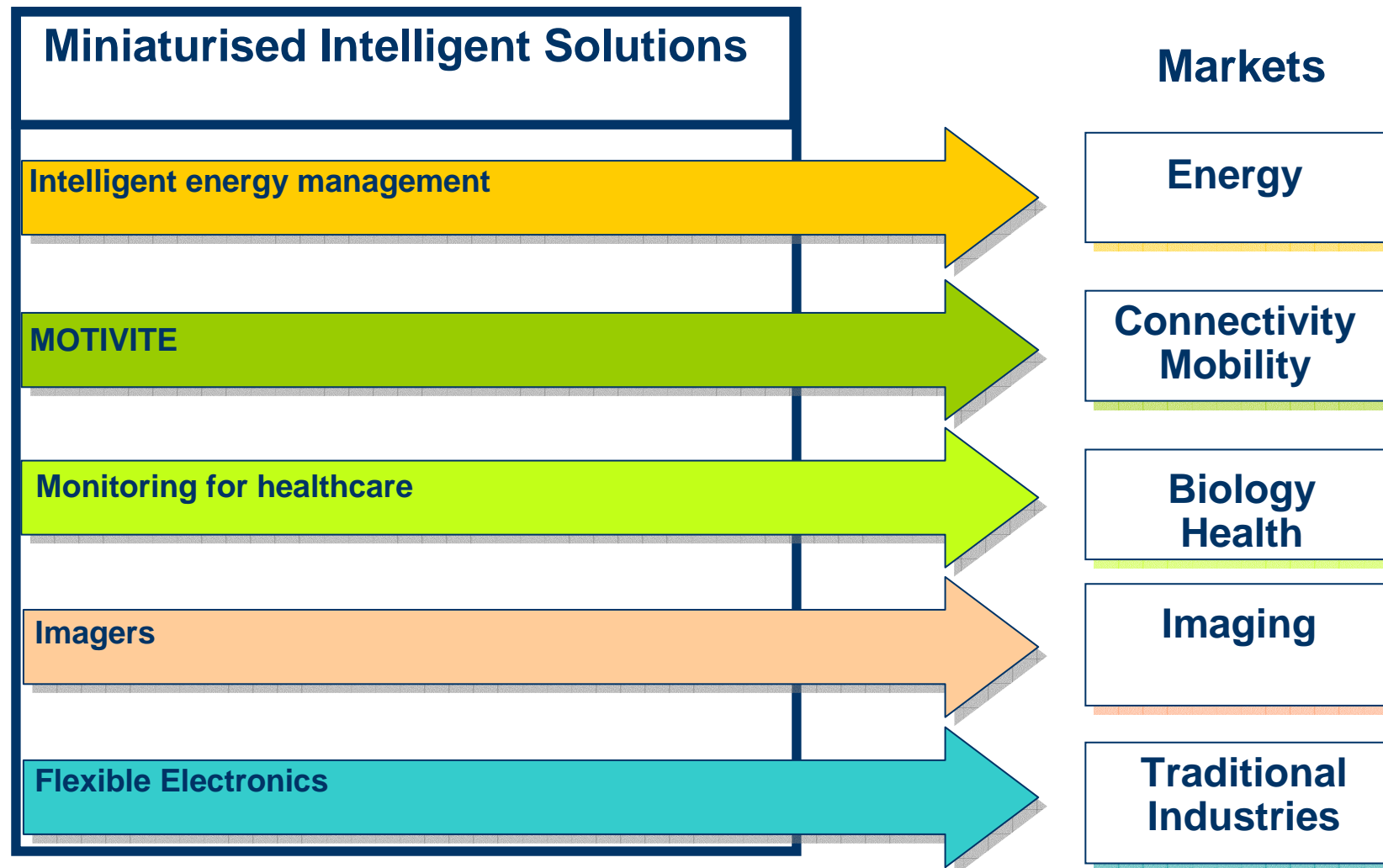
Public research	1 800 jobs
Companies	11 000 jobs
<b>TOTAL</b>	<b>12 800 jobs</b>

Education	2 550 students
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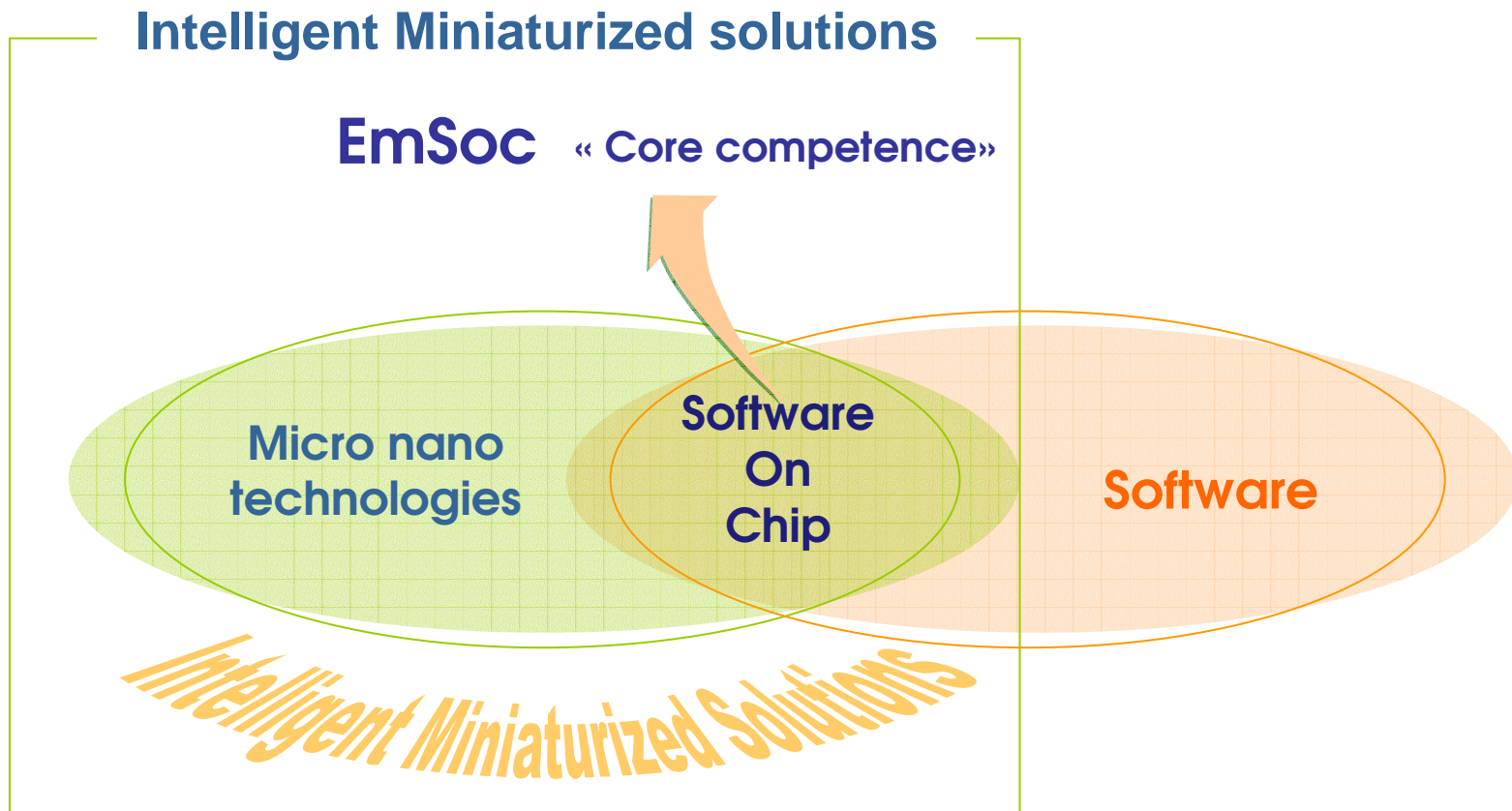
## Strategy of « MINALOGIC »

To develop, in collaboration with the major national and multinational players present on site, **Miniaturised Intelligent Solutions**, with high differentiation and value added.



## Strategy of « MINALOGIC »

Strengthen the technical base in micro nanotechnologies & embedded software on chip



# The 47 players of « MINALOGIC »

## Companies



## Education and research



## Local Authorities



## Economic Development agencies





## 6 selected projects

**GIN Materials innovation Center**

**IMALOGIC**

**MINIMAGE**

**EmSoC 2 Workbench of the future  
Smart Electricity**

**PRINTRONICS**

## MINALOGIC projects

### GIN, Innovation centre for materials (leader SOITEC)



Provide new materials for applications of nanotechnologies, most promising substrates for nanoelectronics.

Provide a pilot for the 45nm node in 2007 and for the 32 nm node in 2009.

**Budget (4 years) : 207 M€ or 50 M€/yr**

### Professional imagers IMALOGIC (leaders Sofradir, Atmel, Ulis, Trixell)



Take advantage of the exceptional cluster in the field to provide in 2008 new products for the fast growing markets of car safety, medical imaging, security and control.

**Budget (3 years) : 77 M€ including 64 M€ of R&D**

**First year budget : 19,5 M€ of R&D and 6,3 M€ of investments**



## MINALOGIC projects



### **CMOS imagers for consumer goods MINIMAGE**

(Leader ST Microelectronics)

Make France (Rhône-Alpes and PACA) the world leader of CMOS imagers for consumer goods by doubling production by 2010

**Budget 440 M€**

Including 232 M€ of research expenses in Minalogic



### **Workshop of the future EmSoC**

(leader ST Microelectronics)

Develop new tools for speeding up the development of embedded systems on chips.

**Budget (4 years) 49 M€**

Project organized in 4 work package

## MINALOGIC projects

### Smart Electricity and optimal use of energy EmSoC (Leader: Schneider Electric)



Strengthen the convergence of technologies in electricity, automation and communication.  
Develop shared generic tools and methods and accelerate integration of innovations made possible by Systems on Chips.

**Budget (4 years) 38 M€**

Organized in 9 work packages focused on innovations for electrical switchboards

### Smart soft substrates (Leader Sofileta)



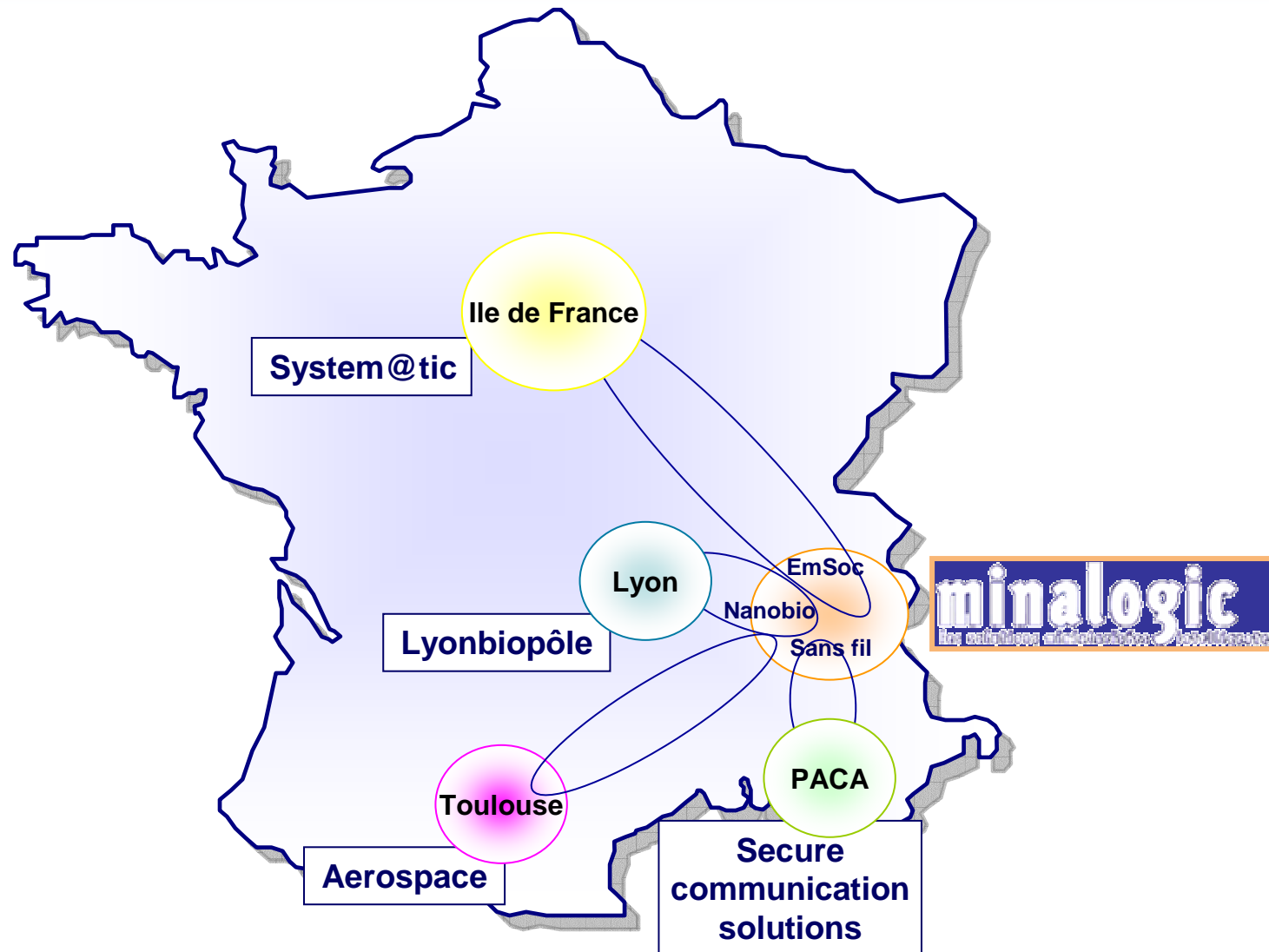
Develop printing equipment and processes for industrial production of electronic components on textiles and soft substrates.  
(pilot line for automatic printing process end of 2008)

**Budget (4 years) 20 M€**

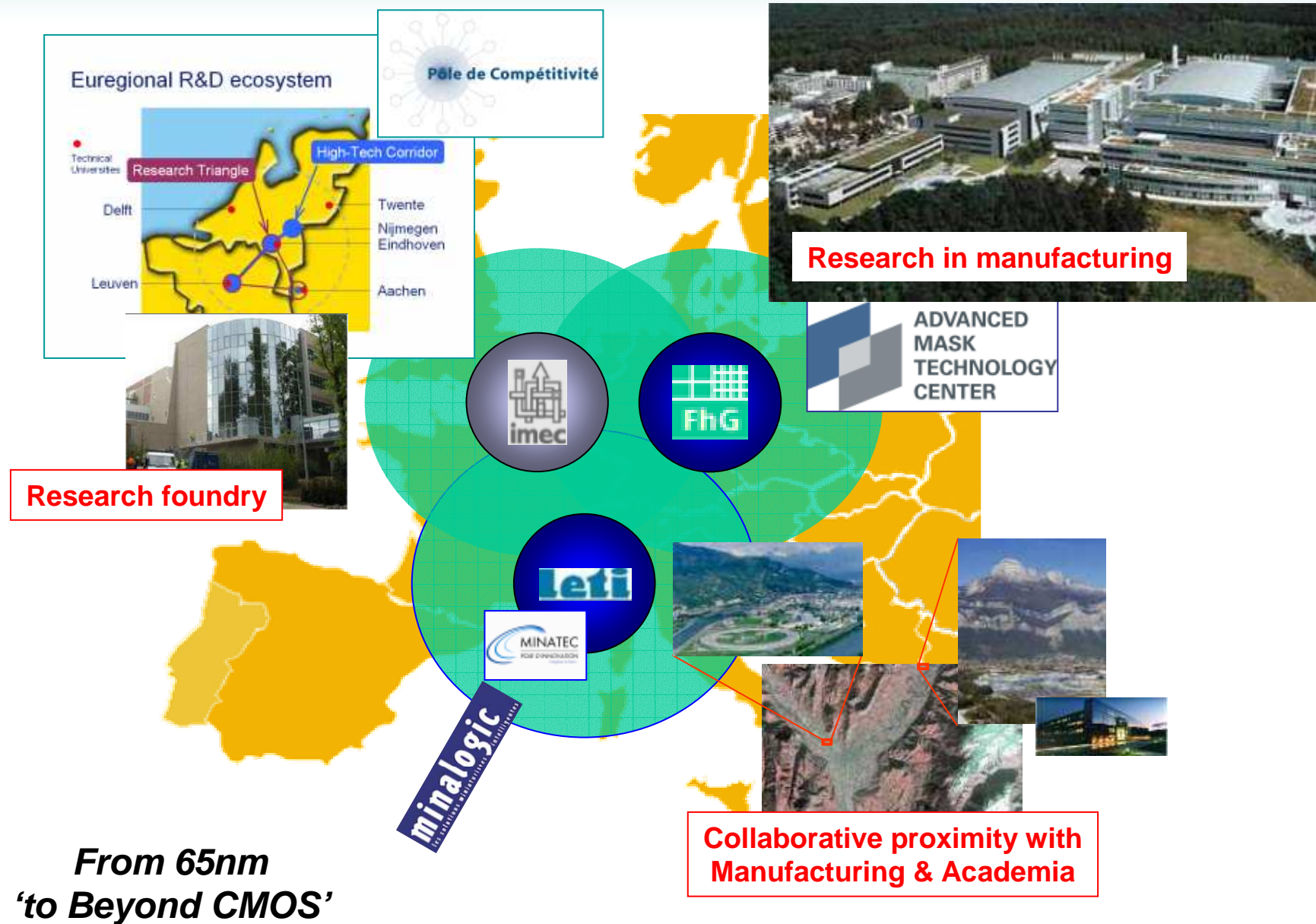
Including **3M€** for METIS R&D workshop and **8M€** for prototype machines



# The all-important connection with other clusters in France

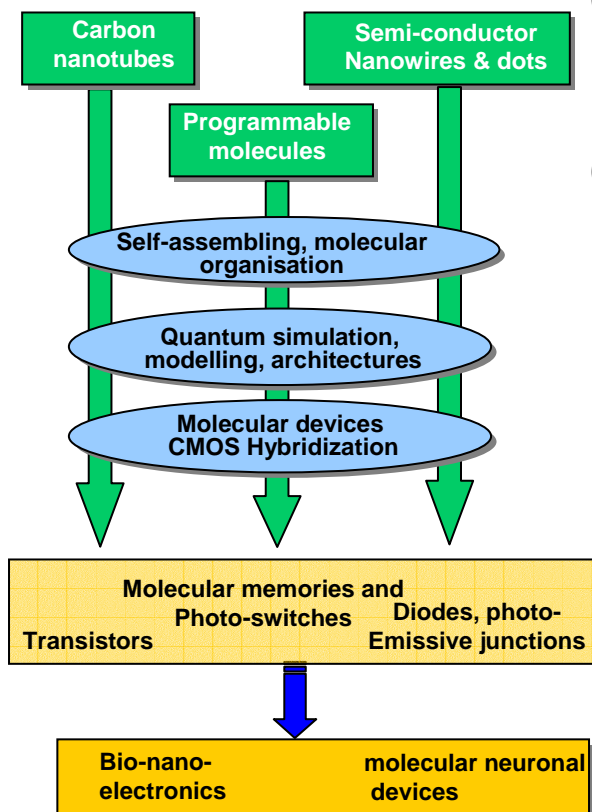


# European 300 mm R&D Ecosystem



# CHEMTRONICS

## « Early Stage Training »

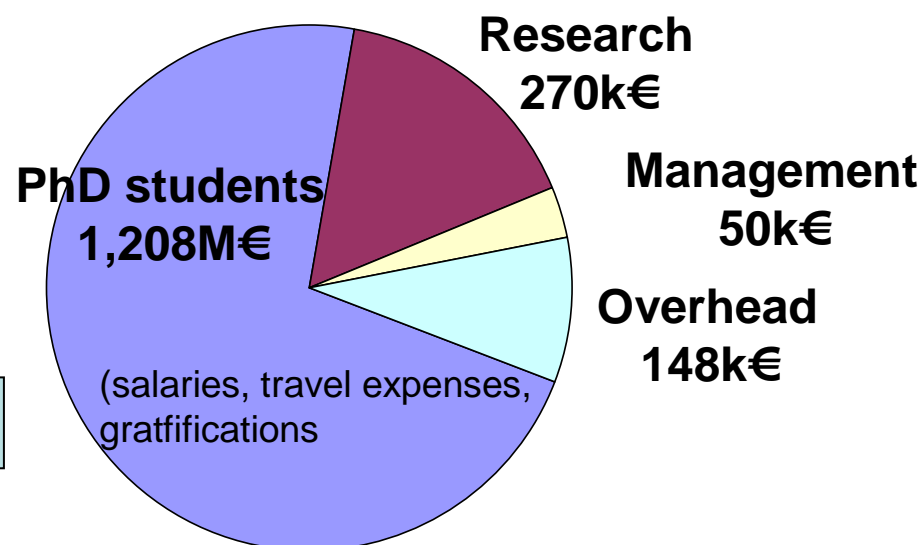


**Objectifs :** Train young researchers at the frontier between nanoelectronics and chemistry

**Coordination :** CEA/DSM/DRFMC

**Duration :** 4 years (since 03/01/2006)

**Budget :** 1,68M€, funding 10 doctorates of 3 years (foreign graduates, more than 70% from Europe).



<http://www-drPMC.cEA.fr/chemtronics>



# Conclusion

## **Pôle de compétitivité Minalogic**

- **a tool for development of Europe in micronanotechnologies and embedded systems on chips**
- **open to researchers of other European countries**

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