

Green chemistry & sustainable production in France

CNRS & importance of international collaboration

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Green chemistry & sustainable production in France

● First players

in 1994

AGRICE
AGRICULTURE
FOR CHEMICALS
AND ENERGY

a consortium with industry,
agriculture & research bodies
for project funding

- created by French Ministries
Agriculture, Environment, Industry, Research
managed by ADEME
French Agency for Environment & Energy Management

- **sustainable development**
biomass for **chemicals & energy**

www.ademe.fr/partenaires/agrice/htdocs_gb/research01.asp

Green chemistry & sustainable production in France

- First players



National
Institute for
Agricultural
Research

a public research organisation
with finalised projects

- a new Department set up in 2004
Department for Science & Process Engineering of Agricultural Products
www.inra.fr/cepia/english
- animal & plant raw materials for **chemistry, energy, materials**
- innovation in **biotechnologies & sustainable chemistry**

Green chemistry & sustainable production in France

- First players



French
Petroleum
Institute

a public industrial R&D
organization on energy

www.ifp.fr

new technologies for **sustainable development**



- **biomass** to biodiesel
units in 2005 (France)
2007 (Sweden & US)
- **biomass** to H₂ (with CEA)

Green chemistry & sustainable production in France

- second generation of biodiesel



Green chemistry & sustainable production in France

- end 2005,
a major event for French fundamental research

Chemistry Nobel Prize for Green Chemistry

National programme

Green chemistry & sustainable production

A new interdisciplinary programme

Chemistry in support of sustainability

- launched by the **Chemistry Department** in October 2006
- 3 years, 2007-2010
- in cooperation with 4 other Departments

Engineering
Life Sciences
Humanities and Social Sciences
Environnement & Sustainable Development

Scientific objective: changes in chemical concepts & practices

4 topics

- integration of the societal approach
renewable resources as chemical feedstocks for new products & materials
- eco-compatibility
12 principles of Green Chemistry guide, including biotechnologies
- new alliance with engineering
process optimization & new media for chemical synthesis
- assessment & reduction of the impact on the environment
an integrated approach from analytical chemistry to LCA

Instrument

- 400 000 euros/y
- 4 research networks connecting public & private laboratories
- mobility, information exchange, seminars & workshops

Outcome

- networking of CNRS labs to get a **critical mass** for National, European & International recognition
- identify themes for competitive research
- involve the industrial sector
- identify new jobs & appropriate cursus
- reconcile Chemistry & Society
- **identify scientific challenges in REACH regulation**

in 2007 - A new French agency (Ministry of Research)
for research project funding

- public & private cooperation encouraged
- proposal selection on scientific & economic criteria
- 4-year projects
- **thematic, non-thematic, young researcher calls**

in February 2007, a new thematic call for
Chemistry & Processes in Support of Sustainability

International cooperation

a public research organisation
fundamental & applied projects
25% of the civil research budget
2006 budget: 2,738 billion euros

- the largest fundamental research organization in Europe
26 000 employees: 45% researchers, 55% technicians & administratives
- supervision authority: Ministry of Research
- involved in all scientific fields with **6 Scientific Departments**

International cooperation

managed by the Office of European & International Relations (DREI)

agreements signed by CNRS & foreign research organizations

5 tools

- Exchange
- International Programme for Scientific Cooperation (**PICS**)
- European & International Associated Laboratory (**LEA & LIA**)
- European & International Research Group (**GDRE & GDRI**)
- International Joint Unit (**UMI**)

International cooperation

Exchange (bilateral)

- 1 to 2-year joint research project
- scientist exchange for **week to month**
- should involve **young researchers**
- 590 projects worldwide (60 countries)
Europe (303), Africa - Middle East (159), Americas (63), Asia (65)

with Finland (AFFRST)

Suomalais-ranskalaisen teknillistieteellisen seura

International cooperation

International Program for Scientific Cooperation (PICS)

bilateral

- 3-year, non-renewable
- based on **on-going** collaboration with **co-publications**
- **short-medium visits, organization of meetings**
- proposal needs approval by the relevant Scientific Department
- co-evaluated by CNRS & foreign partner
- **332 PICS worldwide**
Europe (104), Africa - Middle East (24), Americas (149), Asia (64)

International cooperation

European/International Associated Laboratory (LEA/LIA)

bilateral

- **"laboratory without walls"**, not a legal entity
the participating labs retain their independence, regular status...
- jointly-defined project
designed to "add value" to its individual pursuit
- 4 years, renewable once
- needs approval by the relevant CNRS Scientific Department
- co-evaluated by CNRS & foreign partner
- **earmarked funding** from CNRS & foreign partner
equipment, scientific missions, associate research positions...
- **48 LEA/LIA**
Europe (22), Africa - Middle East (6), Americas (8), Asia (15)

International cooperation

European/International Research Groups (GDRE/GDRI)

- 2 or more countries
- research network connecting public & private laboratories on a specified theme
- 4 years, renewable once
- mobility, information exchange, seminars & workshops
- needs approval by the relevant CNRS Scientific Department
- co-evaluated by CNRS & foreign partners
- 56 GDRE/GDRI
Europe (39), Africa - Middle East (9), Americas (3), Asia (9)

International cooperation

International Joint Units (UMI)

bilateral

- created in 2002
- 4-year, renewable twice
- one location either in France or in another country
- staffed by personnel from both CNRS & foreign partner
- similar status to CNRS Joint Research Unit (UMR)
- 9 UMI
Europe (3), Americas (5), Asia (2)



European/International Research Groups (**GDRE/GDRI**)
International Programs for Scientific Cooperation (**PICS**)

- an example

GDRI: Nano & Micro Systems
<http://namis.iis.u-tokyo.ac.jp/>

Western Europe

strong demand from foreign partners for structured cooperation
LEA, GDRE

Green Chemistry

CNRS-DFG call in 2006

with French Ministry of Foreign Affairs-CEA-INRA

scientist exchanges

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