



## **Carnot Institute for Energy and Environment in Lorraine**

### → **Materials, Geosciences, Processes and Energy**

a scientific synergy which offers an answer to the needs for research and innovation of industry

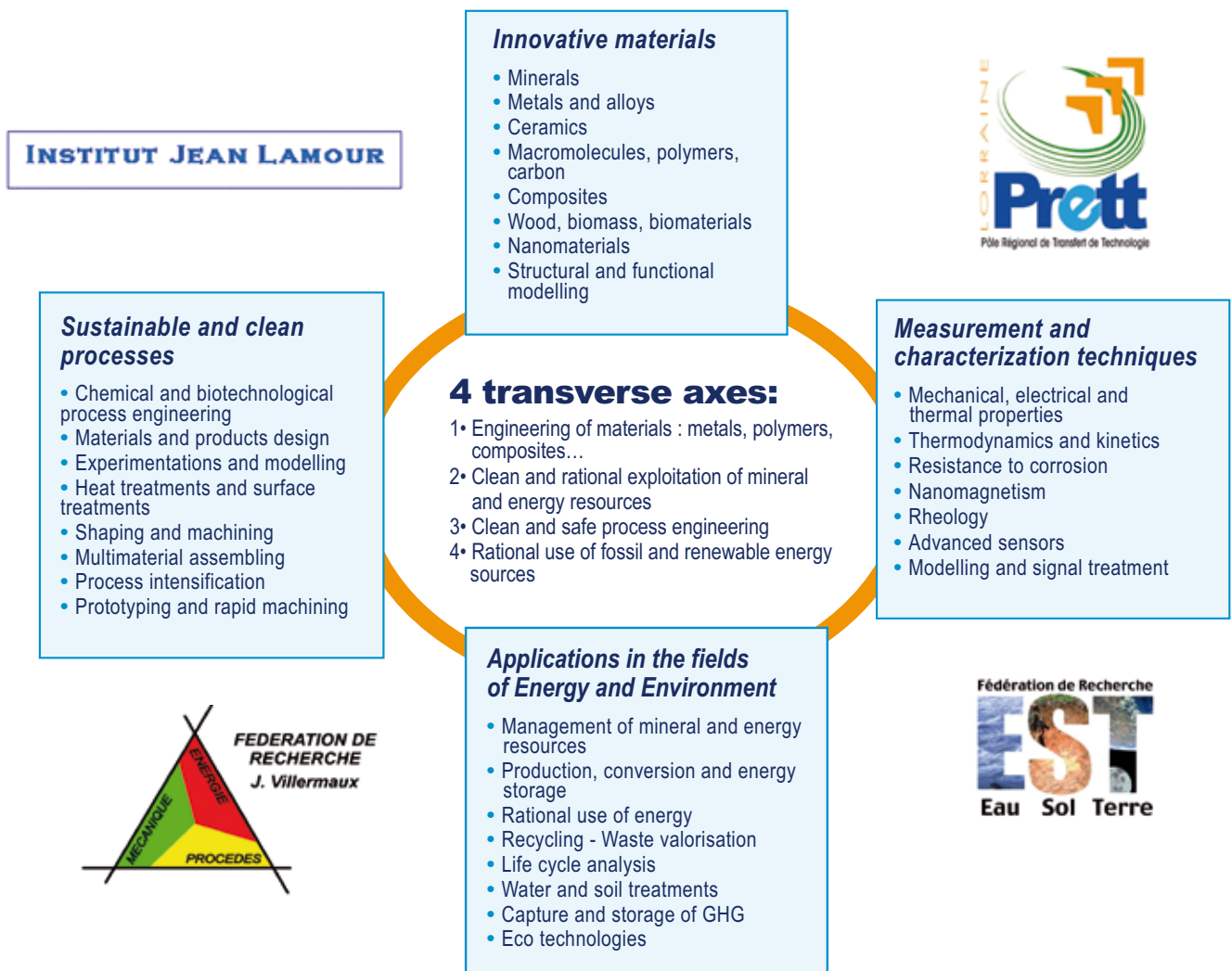
ICÉEL Carnot Institute for Energy and Environment in Lorraine associates one institute and two research networks, namely **Jean Lamour** (skills in Materials), **Water-Soil-Earth** (skills in Geosciences), **Jacques Villermaux** (skills in Mechanics, Energy, Chemical Engineering), gathering 15 laboratories affiliated to CNRS and Nancy-University (INPL, UHP) as well as the Regional Pole of **Research and Technology Transfer** (PRETT) in Lorraine grouping 8 research transfer centers.

Thus ICÉEL concentrates exceptional resources, i.e. highly specialized scientific techniques together with strong human potential. ICÉEL aims at the development of clean and secure processes with low energy consumption, and directed for the rational use of energy resources and finally, at the design of innovative materials and intelligent products.

ICÉEL is based on very high scientific skills in chemistry and physics of materials, in geochemistry, in chemical and biological process engineering, in material development, and in innovative transformation processes. The laboratories grouped in ICÉEL institute centered in the Nancy area have gathered a strong tradition of industrial collaboration, which is based on a one hundred years old experience closely linked to its 10 engineering colleges.

### → **A scientific strategy based on four major transverse axes**

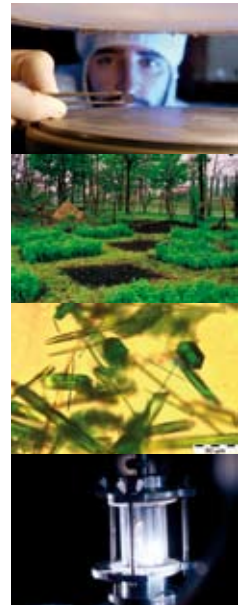
Sustainable development in...





## → Examples of some multi-fields projects developed within the ICÉEL Institute

- **Capture and CO<sub>2</sub> storage** : Innovating gas – liquid contactor developed for carbon dioxide capture, injectivity control of CO<sub>2</sub> in deep reservoirs, wellboring integrity surveys for the geological CO<sub>2</sub> storage
- **Kinetic modelling** of the thermal stability of hydrocarbons in oil fields
- **Development, characterization and optimization** of nano-organized polymers with specific functions
- **Cluster “Fuel cell with membranes”** : thermics and water management in the fuel cell heart, membranes ageing control
- **Microfluidic and multi-scale fluidic system** : to design, characterize and test microstructured reactor for the transfer intensification in matter and energy transformation processes
- **Materials layout and performance**, chemical engineering and sustainable development
- **Depollution of soils (GISFI)** : 14 laboratories and 5 companies engaged in a scientific and technological project for sustainable requalification of degraded sites polluted by past industrial activities with experiments implemented on site



→ Primary funding institutions of the Carnot institute:



Nancy-Université

## → ICÉEL's 15 laboratories and 8 research transfer centers

### Institut Jean Lamour

- P2M Department of Matter and Materials Physics
- CP2S Department of Chemistry and Physics of Solides and Surfaces
- SI2M Department of Science and Engineering of Materials and Metallurgy

### Fédération Eau - Sol - Terre

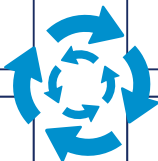
- CRPG Petrographic and Geochemical Research Center
- G2R Laboratory of Geology and Mineral & Energy Resource Management
- LAEGO Laboratory of Geomechanics, Civil Engineering and Environment
- LEM Laboratory of Environment and Mineralurgy
- LiMos Laboratory of Microorganisms - Minerals - Organic matter - Interactions in Soils
- LSE Soils and Environment Laboratory

### PRETT Lorraine

- APOLLOR, plasturgy and polymers
- CRITT Bois, wood technology
- CRITT TJF&U, fluid jet and machining
- CRITT METALL 2T, metals and alloys
- CIRTES, rapid prototyping
- INSTITUT DE SOUDURE, assembling
- ICAR, materials and ceramics
- PPE, polymers and composites

### Fédération Jacques Villermaux

- LSGC Laboratory of Chemical Engineering Sciences
- DCPR Department of Physical Chemistry of Reactions
- LTMP Laboratory of Thermodynamics of the Multiphase Media
- GEMICO Center of Chemical Engineering for Rheologically Complex Media
- LCPM Macromolecular Physical Chemistry Laboratory
- LEMTA Laboratory of Energetics and Theoretical & Applied Mechanics
- GREEN Group of Research in Electrical engineering and Electronics of Nancy
- LERMAB Laboratory of Studies and Research on Material Wood



## → Key figures

### ■ Personnel

Permanent: 420

PhD students: 550

### ■ Budget

Global budget: 62 M€

Partnership research incomes: 15 M€

## → Contacts

■ Michel SARDIN: Director - michel.sardin@iceel.fr

■ Jean-Michel CROMPIN: Operations Manager  
jean-michel.crompin@iceel.fr  
+33(0)3 83 85 64 26 / www.iceel.fr