Growing a world of value-driven projects

2013 Activity Report
Dear Axelera members and partners,

The year 2013 was a pivotal one for the chemical and environmental sectors as a whole, and for Axelera in particular, with two events standing out as particularly noteworthy. First, we signed our 2013–2018 performance contract with the French government. Second, we implemented our strategy roadmap for phase 3.0 of France’s national cluster policy. This new chapter in our history will be marked by a sharp focus on value creation and international development—two priorities already reflected in the many initiatives we rolled out throughout 2013. The Axelera Business Club is one of these new programs. It gives our members opportunities to create mutually-beneficial partnerships. Also worth mentioning is our role in the EU SCOT (Smart CO2 Transformation) project.

Innovation continued to play a central role in 2013. A total of 22 new R&D projects were certified by the cluster and secured financing. These projects cut across the five priority topics set forth in our strategy roadmap: renewable raw materials, preservation and restoration of natural and urban areas, ecoefficient factories, chemicals and materials for manufacturing industries, and recycling and recyclability. Moreover, energy efficiency—increasingly crucial for companies across the chemical and environmental sectors to maintain their competitive advantage and ensure future growth—is now addressed by Axelera projects in all of these areas.

And, to support innovation, we continued to develop new resources for our members and partners. These include the Axel’One collaborative workspace and pilot plants and the IDEEL Institute for Excellence in Carbon-free Energy and the Factory of the Future.

Our network—the cornerstone of our success—also expanded in 2013. We welcomed 39 new members during the year, bringing the total to 281 at year’s end. And as our network grew, so did our lineup of member services, which we continued to tailor to meet the unique needs of the SMEs, large corporations, research labs, educational institutions, training providers, government agencies, and financiers that constitute our membership.

In 2013 we provided our members with innovation support throughout the R&D project lifecycle; we fostered their business and international development strategies by providing insight into issues like innovation marketing; we helped our SME members raise their profiles by giving them opportunities to exhibit at Axelera booths at the JEC Europe and Pollutec Paris trade shows; and we ran fact-finding missions to Brazil and Belgium.

All of these initiatives have put us firmly on course toward our new objective: inventing the products of the future. At year’s end we overhauled our logo and baseline, “Axelera: a driver for sustainable growth”, to reflect this shift.

I am honored to have been chosen once again in June 2013 to chair the cluster, and I am pleased to be working closely with an expanded and engaged management team that now includes two SME member representatives. Our operational staff—committed to serving our members and partners—also welcomed new recruits bringing a wide range of skills to the cluster.

I am proud to share with you the Axelera 2013 Activity Report—a snapshot of the projects and people that made 2013 such a successful year for us and for you, our members and partners.

Bruno Allenet, Chairman
AXELERA 3.0: FORGING A NEW IDENTITY

We successfully leveraged research and innovation to help drive sustainable growth across the chemical and environmental sectors in 2013. Our “3.0” strategy roadmap launched in 2013 boldly charts a new course: to invent the products of the future while creating value and ramping up our international initiatives for the benefit of our members.

GOALS

Identify and nurture innovative, cost-competitive solutions at the crossroads of the chemical, environmental, and energy sectors, and leverage the strengths of our regional ecosystem to create international growth opportunities for our members.

VALUES

Communication, accountability, engagement, and efficiency

PROJECTS

202 R&D projects certified by Axlera and financed for a total of €675 million

NETWORK

281 members, two-thirds are businesses and half are SMEs

5 founding members
Arkema, the French National Center for Scientific Research (CNRS), GDF Suez, Suez Environnement, IFP Énergies nouvelles, and Solvay

8 financing partners
The French government; the Rhône-Alpes Regional Council; the Rhône, Isère, Drôme, and Haute-Savoie General Councils; and the Greater Lyon (Grand Lyon) and Greater Grenoble (La Métro) Intermunicipal Authorities

RESOURCES

6 certified technology platforms, including the Axel’One collaborative workspace with pilot plants for clean processes and innovative materials

1 certified institute for the energy transition: the IDEEL Institute for Excellence in Carbon-free Energy and the Factory of the Future

OUR OPERATIONAL STAFF

Left to right: Aurélie Ohannessian, Samira Belamri, Talia Brun, Louise Guhmann, Philippe Le Thuaut, Élodie Devers, Virginie Pevere, Coralie Ballet, Céline Gobin, Laure Hugonnet, Douchka Chasson, and François Brunet
A FIVE-PRONGED STRATEGY:

• Designed to uphold the three pillars of sustainable development: the environment, the economy, and society.

• Addresses our five priority markets: chemicals, construction, transportation, environment, and energy.

MAKING ENERGY PART OF THE EQUATION

To ensure that our industry remains competitive through more energy-efficient plants and processes and new, low-carbon processes

To spur growth across the chemical and environmental sectors through new materials and components for renewable energy, recycling, and recyclability
2013: YEAR IN REVIEW

The year 2013 was a busy one for us and for the chemical and environmental sectors as a whole, with promising new R&D projects, notable achievements, and exciting opportunities.

- 2nd Franco-Chinese Congress on green chemicals in Lyon, France; co-organized by Axelera
- Axelera Thursday New Year’s edition in Lyon attended by around 100 people
- Axelera attends Pollutec trade show in Oran, Algeria
- Workshop and panel discussion on the energy transition at IFP Energies nouvelles, organized by Axelera and LUTB
- Joint Composites Rhône-Alpes booth at the JEC Europe trade show in Paris, led by Axelera
- Axelera partners with PCH Meetings chemical, petrochemical, and pharmaceutical industry convention in Lyon
- Axelera exhibits on the Manufacturing and Innovation Train in Lyon
- Axelera’s new service lineup unveiled
- AXACIA project presentation in Lyon
- Ground breaks on Axel’One collaborative workspace pilot plant in St. Fons
- Axelerate attends the Pollutec trade show in Oran, Algeria
- Workshop and panel discussion on the energy transition at IFP Energies nouvelles, organized by Axelera and LUTB
- Fact-finding mission to Brazil on plant-based chemicals co-organized by Axelera
- Axelerate runs booth on Rhône-Alpes Chemical Village at the Mondial des Métiers career fair in Lyon
- Fact-finding mission to Brazil on plant-based chemicals co-organized by Axelera
- AXACIA project presentation in Lyon
- Ground breaks on Axel’One collaborative workspace pilot plant in St. Fons
- Axelera runs booth on Rhône-Alpes Chemical Village at the Mondial des Métiers career fair in Lyon
- Manufacturing and Innovation Train
- Axelera Thursday for SMEs at the Lyon Aquarium highlights 9 innovative SMEs
- Axelerate Business Club launches at INSA Lyon
- Axelera signs partnership agreement with BNP Paribas
- Bruno Allenet (GDF Suez) elected Chairman of Axelerate and Axelerate Bureau expanded to include two representatives of SME members

FACTS & FIGURES

JAN
- Axelerate runs booth on Rhône-Alpes Chemical Village at the Mondial des Métiers career fair in Lyon
- Fact-finding mission to Brazil on plant-based chemicals

FEB
- Axelerate runs booth on Rhône-Alpes Chemical Village at the Mondial des Métiers career fair in Lyon
- Fact-finding mission to Brazil on plant-based chemicals

MAR
- Ground breaks on Axel’One collaborative workspace pilot plant in St. Fons
- Axelerate’s new service lineup unveiled
- Joint Composites Rhône-Alpes booth at the JEC Europe trade show in Paris, led by Axelerata
- Axelera partners with PCH Meetings chemical, petrochemical, and pharmaceutical industry convention in Lyon
- Axelera exhibits on the Manufacturing and Innovation Train in Lyon

APR
- ACACIA project presentation in Lyon
- Ground breaks on Axel’One collaborative workspace pilot plant in St. Fons
- Axelerate runs booth on Rhône-Alpes Chemical Village at the Mondial des Métiers career fair in Lyon
- Fact-finding mission to Brazil on plant-based chemicals co-organized by Axelera
- AXACIA project presentation in Lyon
- Ground breaks on Axel’One collaborative workspace pilot plant in St. Fons

MAY
- Axelerate becomes partner of the European PPP SPIRE (Sustainable Process Industry through Resource and Energy Efficiency)
- Group fact-finding mission to Belgium’s GreenWin cluster
- Presentation of phase 3.0 of Axelerate’s strategy at the Axelerata Thursday meeting at INSA Lyon
- Axelerate Business Club launches at INSA Lyon
- Axelerate signs partnership agreement with BNP Paribas
- Bruno Allenet (GDF Suez) elected Chairman of Axelerate and Axelerate Bureau expanded to include two representatives of SME members

JUNE
- **Axelera Thursday meeting** hosted by Greater Grenoble Intermunicipal Authority

- **Weekly events bulletin** is launched

- **New, overhauled Axelera newsletter** is launched

- **PCB-Axelera project presentation day** at CPE Lyon

- **Axelera signs 2013–2018 performance contract** with French and local governments

- **Annual Axelera press conference**

- **Axelera partners with the 14th SFGP Process Engineering Congress** in Lyon

- **Partnership agreement signed** with EM Lyon Business School

- **Axelera partners with Waste Meetings convention** (waste treatment and recycling) in Lyon

- **Second meeting of the Axelera Business Club**

- **Axelera attends** Pollutec trade show in Casablanca, Morocco

- **EU SCOT** (Smart CO2 Transformation) project kicks off

- **First edition of the CIPEQ congress** for the process industries and their equipment manufacturers in Lyon, co-organized by GIFIC, SFGP, and Axelera

- **Axelera Thursday meeting** ends the CIPEQ congress program

- **Indoor air quality workshop** held in Lyon by Axelera in conjunction with non-profit association AIR

- **Axelera signs 2013–2018 performance contract** with French and local governments

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OUR INNOVATION STRATEGY ALIGNS WITH REGIONAL, NATIONAL, AND EU INNOVATION POLICIES

As a major stakeholder in the chemical and environmental sectors, we align our development strategy and initiatives with those of our partners.

THE RHONE-ALPES REGION

In 2013 we contributed to the Regional Innovation Strategy by drawing up the region’s Smart Specialization specifications for the chemical and environmental sectors. This initiative to organize the region’s innovation programs aligns with the European Commission’s innovation policy.

EUROPE

Under the EU’s Horizon 2020 innovation framework program, we became a member of the European PPP SPIRE (Sustainable Process Industry through Resource and Energy Efficiency) in May 2013.

FRANCE

We sit on two national industry-specific strategy committees:
- Chemicals and materials: We served on the steering committee and the innovation workgroup set up in 2013
- Eco-industries: We participated in the innovation workgroup

We are also active in France’s Association of Competitive Clusters.

PARTNERSHIPS ARE THE KEY TO DEVELOPMENT

We strengthened our relationships with a number of other organizations in 2013.

THE RHONE-ALPES REGION

We have been working closely with the Plastipolis and Techtera clusters under the Composites Rhône-Alpes initiative since 2011. In March 2013 this partnership enabled us to exhibit at the JEC Composite trade show in Paris. Our new strategy roadmap also includes teaming with the Lyonbiopôle cluster on projects in the healthcare and environmental sectors and the Tenerrdis cluster on projects in the energy sector.

EUROPE

Under the EU’s FP7 (Region of Knowledge), we became a partner of the EU’s SCOT (Smart CO₂ Transformation) project.

FRANCE

We pursued our national intercluster networking efforts, most notably through the EcoTech network (of the French Ministry of Ecology, Sustainable Development, and Energy). We also participated in UIC (French chemical-industry federation) initiatives on plant-based chemicals and chemicals & recycling.

EUROPE

We pursued joint initiatives with other European clusters like GreenWin and FISCH (both in Belgium).
In 2013 we certified 22 R&D projects that secured financing. These projects address the five priority R&D topics outlined in our strategy roadmap.

| R&D PROJECTS CERTIFIED BY AXELERA AND FINANCED IN 2013 |

**RENEWABLE RAW MATERIALS**

<table>
<thead>
<tr>
<th>PROJECT</th>
<th>LEAD</th>
<th>DESCRIPTION</th>
<th>FUNDING PROGRAM</th>
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</thead>
<tbody>
<tr>
<td>FUNLOCK</td>
<td>INRA Marseille</td>
<td>Fungal enzymes to unlock recalcitrant biomass hydrolysis</td>
<td>ANR BioME</td>
</tr>
<tr>
<td>SHAPeS</td>
<td>E2P2L (CNRS/Solvay)</td>
<td>New selective animation processes for bio-based monomer synthesis</td>
<td>ANR CD2i</td>
</tr>
<tr>
<td>BIOBUTTERFLY</td>
<td>MICHELIN</td>
<td>A new manufacturing process for biomass-based synthetic rubbers</td>
<td>AMI ADEME</td>
</tr>
</tbody>
</table>

**ECO-EFFICIENT FACTORIES**

<table>
<thead>
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<th>FUNDING PROGRAM</th>
</tr>
</thead>
<tbody>
<tr>
<td>PREDIREF</td>
<td>ARKEMA</td>
<td>Predict the physical properties of next-generation refrigerant fluids</td>
<td>ANR CD2i</td>
</tr>
<tr>
<td>SCOT</td>
<td>GREENWIN/AXELERA</td>
<td>Smart CO₂ transformation</td>
<td>Europe FP7</td>
</tr>
<tr>
<td>VALCO₂ II</td>
<td>SOLVAY</td>
<td>Converting CO₂ to chemicals and energy</td>
<td>FUI 17</td>
</tr>
<tr>
<td>VANECAO</td>
<td>SOLVAY</td>
<td>Eco-efficient processes for vanillin manufacturing</td>
<td>Europe LIFE +</td>
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</table>

**CHEMICALS AND MATERIALS FOR MANUFACTURING INDUSTRIES**

<table>
<thead>
<tr>
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<th>FUNDING PROGRAM</th>
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<tbody>
<tr>
<td>COUPOX</td>
<td>ICBMS (Claude Bernard University Lyon, CNRS)</td>
<td>Oxidative cleavage of diols</td>
<td>ANR CD2i</td>
</tr>
<tr>
<td>CYRRENAS</td>
<td>BOSTIK</td>
<td>New environmentally-friendly synthetic cyclocarbonate building blocks that react at ambient temperature for polyurethane putty and adhesive applications</td>
<td>ANR MATETPRO</td>
</tr>
<tr>
<td>MIMINELA</td>
<td>ALUINNIUM PECHINEY ALLVAL</td>
<td>Inert anode material and interface mechanisms for aluminum electrolysis</td>
<td>ANR MATETPRO</td>
</tr>
<tr>
<td>HYSINANO</td>
<td>LGPC (CNRS/CPE Lyon)</td>
<td>Olefin hydroisilyation using nanostructured catalysts</td>
<td>ANR CD2i</td>
</tr>
<tr>
<td>IBIS</td>
<td>PAREX Group</td>
<td>Innovative bio-based insulation systems for building renovation applications</td>
<td>AMI ADEME</td>
</tr>
<tr>
<td>SMOUSSIF</td>
<td>HUTCHINSON</td>
<td>Functional silicone foam synthesis</td>
<td>FUI 17</td>
</tr>
<tr>
<td>SOLARCLYM</td>
<td>DICKSON</td>
<td>Development of heat protection coatings transparent to visible light for use on textiles and rigid materials</td>
<td>FUI 17</td>
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</tbody>
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**RECYCLING AND RECYCLABILITY**

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</tr>
</thead>
<tbody>
<tr>
<td>IMPROVMURE</td>
<td>EIFFAGE Travaux Publics</td>
<td>Innovative materials and processes for the multi-recycling of asphalt</td>
<td>ANR MATETPRO</td>
</tr>
<tr>
<td>RECVALE-HPM</td>
<td>CEA-Liten</td>
<td>System for recovering used permanent magnets in waste electronic equipment for reuse and recycling</td>
<td>ANR MATETPRO</td>
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</tbody>
</table>

**PRESERVATION AND RESTORATION OF NATURAL AND URBAN AREAS**

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<thead>
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<th>FUNDING PROGRAM</th>
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</thead>
<tbody>
<tr>
<td>AquaDNA</td>
<td>LECA (CNRS/Grenoble University Joseph Fourier School)</td>
<td>New DNA technology for estimating the biodiversity of aquatic invertebrates</td>
<td>ANR Eco-TS</td>
</tr>
<tr>
<td>ELSA-PACT</td>
<td>IRSTEA</td>
<td>Environmental and social lifecycle audits to improve business competitiveness through ecological and social transition</td>
<td>ANR Chaires industrielles</td>
</tr>
<tr>
<td>BOREAL</td>
<td>SOLETAQUE BACHY</td>
<td>Bioreinforcement of backfill for hydropower infrastructures</td>
<td>FUI 16</td>
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<tr>
<td>G4M</td>
<td>GDF SUEZ</td>
<td>Multi-industry, multi-material geodetection</td>
<td>FUI 16</td>
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<tr>
<td>DAMIER</td>
<td>KREATIS</td>
<td>Development of REACH-related computer models and applications</td>
<td>FUI 17</td>
</tr>
<tr>
<td>SMILE</td>
<td>HEMERA</td>
<td>Meteological station for urban water monitoring</td>
<td>FUI 17</td>
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A FIVE-PRONGED STRATEGY
BACKED BY A FULL YEAR OF PROJECTS AND INITIATIVES

Our new strategy roadmap is built on five priority R&D topics. We launched, pursued, and completed a number of R&D projects and joint initiatives addressing these key fields.

RENEWABLE RAW MATERIALS

INITIATIVES

- We attended the 2nd Franco-Chinese Congress on green chemicals held at the Rhône-Alpes Regional Council headquarters in January.
- We took part in a fact-finding mission to Brazil on plant-based chemicals in February, as part of an initiative of the Union of Bio-Economic Clusters (UBC).

PROJECTS

Projects completed in 2013:

ALGIMAT (ANR CP2D*) - Advanced functional materials using alginate from algae
- Partners: CERMAT (lead), C2P2
- Budget: €2 million, including €640,000 in public funding
- Results: New macromolecules were synthesized from alginates (polysaccharides contained in brown algae). The substances developed will target multiple markets, including healthcare (for use in bandages).

INBIOSYN SOLV (ANR*) - Virtual synthetic building block and biosolvent development lab
- Partners: LGC (lead), UCAI, LCOM, Solvay
- Budget: €2.9 million including €1.1 million in public funding
- Results: A library of models was developed to predict molecules’ properties within given performance parameters. A software prototype was developed to reverse-engineer molecules from their final specifications. An additional software prototype was developed for chemical synthesis. A new class of biosolvent molecules was formulated and patented.

BIOEXTRA (FUI*) - Recycling bioactive and extractive substances in pulp and paper manufacturing residues and byproducts
- 8 partners, including 1 SME (Biolandes, lead), 3 corporations, 2 laboratories, 1 technical research center, and 1 institute of technology
- Budget: €2.2 million including €1.1 million in public funding
- Duration: Jan. 2010–March 2013
- Certified by: Xylofutur, Axelerar
- Results: An industrial process for extracting wood industry residues and byproducts was developed to enable paper and pulp plants to expand their wood-byproduct recycling solutions—until now limited to energy—and market new plant-based extracts.

CHEMLIVAL (ANR CD21*)
Lignin recovery for fine chemistry and engineered polymers
- Objective: Develop new methods for producing aromatic molecules from lignin using selective heterogeneous catalysis. Applications include engineered aromatic polymer and bioactive molecule synthesis.
- Challenges: Develop alternatives to current synthesis methods by using petrochemical compounds and help meet the chemical industry’s regulatory challenges (REACH) by using innovative catalysis technologies. The compounds developed could address several markets, including enamel varnishes, high-temperature organic matrices for composites, and ionic conducting membranes.
- Partners: IRCE Lyon (lead), FCBA, ICBMS, C2P2, Novasep Process
- Budget: €3 million including €1 million in public funding
- Duration: May 2012–Oct. 2015

*See page 9 for definitions
ECO-EFFICIENT FACTORIES

INITIATIVES

- We organized a day-long presentation of the ACACIA project (to improve the capture of industrial and anthropic CO2) in April
- We co-organized a panel discussion and workshop on the energy transition in conjunction with the LUTB cluster in May
- We became a partner of the European PPP SPIRE (Sustainable Process Industry through Resource and Energy Efficiency) in June
- The EU SCOT (Smart CO2 Transformation) project kicked off in October
- We presented our eco-efficient factories strategy at the Axelera Thursday meeting held at the end of the CIPEQ congress in November

PROJECTS

Projects completed in 2013:

FAST AND FLEXIBLE FACTORY (EU-funded project) - More efficient, agile, and modern production lines
- Objectives: Design and develop a continuous, intensified, and modular “plug-and-play” production line and standardize the associated processes
- 25 partners including project lead Bayer Technology Services
- Budget: €30 million, including €18 million in public funding
- Duration: June 2009–May 2013
- Results:
  - Business benefits: Lower CapEx, faster time-to-market
  - Environmental benefits: Energy consumption reduced by up to 30%, solvent use reduced by up to 100%, overall environmental footprint and transportation-related impacts reduced by up to 50% thanks to local manufacturing
  - Deliverables: New continuous, intensified, and simplified processes validated; new reactor design and improvements to reactor technology validated; an innovative open-access facility for continuous modular production was completed

FERROENERGY (ANR EESI*) - Assess the industrial potential of a heat-to-electricity conversion process using pyroelectric nanoparticles in suspension
- 5 partners, including project lead Armines ParisTech
- Budget: €1.76 million including €770,000 in public funding
- Results: The industrial viability of the process was validated through laboratory testing; a start-up, Ferroenergy, was founded to build pilot industrial heat-to-electricity conversion units

HEXOSIC (ANR CP2D*) - Develop a silicon carbide reactor-exchanger for highly exothermic reactions
- 4 partners, including project lead Bluestar Siloxes
- Budget: €1.8 million including €800,000 in public funding
- Results: A new high-pressure, leak-tight reactor-exchanger technology was developed; the technology was tested on silicon carbide equipment using a highly exothermic reaction; intensification was used to simplify the process

*See page 9 for definitions

VALCO2 II (FUI 17*)
Converting CO2 to chemicals and energy
- Objectives: Develop large-scale CO2 conversion processes for various chemical and energy markets; set up an observatory to identify available sources of industrial CO2 in France.
- Challenges: Use CO2 as an alternative, non-fossil-based source of carbon.
- 5 partners including Solvay (lead)
- Budget: €4 million including €1.3 million in public funding
- Duration: 2014–2018
INICIATIVES

- We organized the joint Composites Rhône-Alpes booth at the JEC Europe trade show in Paris in March; 7 companies and the PEP-Compositec R&D center exhibited.

PROJECTS

Projects completed in 2013:

ECOMAT (FUI 7*) - New pewter- and mercury-free silicones and polyurethanes to reduce environmental and health impacts
- 8 partners, including project lead Bluestar Silicones
- Budget: €7.9 million, including €3.6 million in public funding
- Certified by: Techtera, Axelera
- Results: New catalysts were developed, opening the door to the development of new silicone formulations for textile and paper coating applications for the label market and new silicone putties and adhesives for the household appliance, solar energy, and automotive markets. Market research completed during the project identified additional materials (other than silicones and polyurethanes) for which the new catalysts could be used.

Current project:

BIONICOMP (FUI 14*) - Improve the overall performance of composites using bio-sourced reinforcements to compete with and provide a lighter-weight alternative to composites with fiberglass reinforcements
- 7 partners, including project lead Ionisos (a SME)
- Project launched in December 2012, slated for completion in January 2016
- Budget: 3.2 million including 1.1 million in public funding
- The applied research component of this 38-month project focuses on interface chemistry, with the goal of developing and validating demonstrators (aircraft and motor vehicle interior materials; sporting goods; and engineered textiles with protective and/or decorative properties).

SMOUSSIF (FUI 17)

Functional silicone foam synthesis
- Objective: Develop new structural and/or functional silicone foams capable of withstanding harsh conditions and extreme temperatures for various applications including electrical and acoustical insulation; fireproofing; antistatic properties; water and air tightness; and lightweight structures.
- Challenge: The foams currently available do not meet the specifications of the target markets.
- 5 partners, including project lead Hutchinson
- Budget: €2.7 million including €1.1 million in public funding
- Certified by: Techtera, Axelera

*See page 9 for definitions
INITIATIVES

- We pursued the project on new processes for recycling clinker from household waste incineration that kicked off at the Axelera Technology Tuesday in October 2012.
- We co-organized the Waste Meetings convention in October, with: Presentations of the TRIPTIC project (to develop trackers to optimize waste sorting technology) and the PAREO project (to develop recycling technology for polyamide motor vehicle components).
- We took part in the Committee for Composites Recycling France.
- We took part in the working group on recycling and the circular economy, part of the strategy committee for the chemical and materials industries.

PROJECTS

Projects completed in 2013:

TRIPLE (FUI 7*): Sorting technology for plastic waste from electrical and electronic equipment
A standardized method for analyzing sources of plastic waste from electrical and electronic equipment was developed, and effective recycling processes for these mixed plastics were set up with the goal of increasing overall electrical and electronic waste recycling rates.

- **Lead:** SITA DEEE
- **8 partners**
- **Duration:** Jan. 2010–Jul. 2013
- **Budget:** €3.8 million including €1.6 million in public funding
- **Results:** The R&D work resulted in the identification of sources of complex plastics and the development of a sampling and analysis method that can be duplicated for different industrial processes. Industrial sorting processes were also validated.

VALEEE (FUI 7*): Recycling technology for plastic waste from electrical and electronic equipment
A strategy for recycling the plastic waste from electrical and electronic equipment identified in the TRIPLE project (above) was developed and validated for industrially-manufactured parts.

- **Lead:** Plastic Omnium AES
- **15 partners**
- **Duration:** Sept. 2009–Nov. 2013
- **Budget:** €3.8 million including €1.7 million in public funding
- **Results:** The R&D work resulted in a full review of the current state-of-the-art of compatible and incompatible materials as well as all of the possible means of compatibilization (both theoretical and practical) for formulating alloys that meet user specifications.

IMPROVMURE (ANR MATETPRO*)
Innovative materials and processes for the multi-recycling of asphalt

- **Challenge:** France’s highway system represents a non-negligible source of asphalt aggregates that could potentially be recycled into new asphalts in particular. New low-temperature manufacturing processes constitute an opportunity to both recycle more asphalt and reduce environmental and health impacts. Despite the potential benefits, manufacturers are slow to adopt these processes.
- **Objective:** Identify and find solutions to the scientific and technological hurdles to the use of asphalt aggregates, in particular in asphalt surface courses. The research will look at new lower-temperature manufacturing processes.

- **6 partners,** including project lead Eiffage Travaux Publics
- **Budget:** €2.3 million including €800,000 in public funding

*See page 9 for definitions*
Strategic Projects & Initiatives

**INITIATIVES**

- We partnered with non-profit association AIR (Air Intérieur en Réseau) on a two-day indoor air quality workshop in November.
- The Axelera PCB project presentation day attracted 100 attendees in July.
- We co-organized a day-long technical seminar on optics and the environment with the Optique Rhône-Alpes cluster.
- We joined the EcoTech Cluster Network spearheaded by the French Ministry of Ecology, Sustainable Development, and Energy.
- We sat on the Envirhonalp regional environmental strategy committee.

**PROJECTS**

Project completed in 2013:

**NORMACAT (FUI 8*)** - New photocatalytic materials and systems for air treatment: standardized characterization and performance testing methods.

- **10 partners**, including project lead TERA Environnement.
- **Duration**: March 2010–Aug. 2013.
- **Budget**: €1.7 million, including €1 million in public funding.
- **Results**: New standardized tools and methods were developed to measure performance and test the safety of new materials and systems made using photocatalytic treatment.

**SMILE (FUI 17*)**

Metrological station for urban water monitoring.

- **7 partners** including project lead SITA Remediation.
- **Duration**: Four years.
- **Budget**: €4 million including €1.6 million in public funding.
- **The project aims to lay the groundwork for the recycling of earth excavated from polluted sites during remediation by:**
  - Developing decision-support software to rapidly determine the most appropriate treatment for excavated earth.
  - Validating robust, reliable, and cost-effective equipment, practices, and processes for producing recyclable materials.
  - Developing formulations for road paving applications and techniques for producing aggregates for concrete manufacturing.
  - Writing procedural guidelines for the operation of excavated-earth recycling plants.

**VALTEX (AMI ADEME*)**

Excavated earth recycling.

- **7 partners** including project lead SITA Remediation.
- **Duration**: Four years.
- **Budget**: €4 million including €1.6 million in public funding.
- **The project aims to lay the groundwork for the recycling of earth excavated from polluted sites during remediation by:**
  - Developing decision-support software to rapidly determine the most appropriate treatment for excavated earth.
  - Validating robust, reliable, and cost-effective equipment, practices, and processes for producing recyclable materials.
  - Developing formulations for road paving applications and techniques for producing aggregates for concrete manufacturing.
  - Writing procedural guidelines for the operation of excavated-earth recycling plants.

*See page 9 for definitions.
MEMBERS AND MEMBER SERVICES

Our membership grows with each passing year, and we strive to offer our members a comprehensive range of services designed to meet their needs.

OUR MEMBERSHIP IS GROWING STEADILY

Rhône-Alpes, a center for the chemical and environmental sectors, is particularly well-represented. 205 members are based in the region.

WE CONTINUE TO ATTRACT NEW MEMBERS

A trend confirmed in 2013, with:

39 new members, including 28 SMEs and start-ups

A COMPREHENSIVE LINEUP OF MEMBER SERVICES

We rounded out our member services in 2013 with targeted support for innovation, business development, and international expansion.

1 INNOVATION
- Developing an innovation strategy
- Turning ideas into projects
- Getting projects off the ground
- Supporting businesses at every stage in the project lifecycle
- Maximizing value creation

2 BUSINESS DEVELOPMENT
- Getting new innovations to market
- Directing members to services and training offered by our partners
- Helping members secure private-sector financing

3 INTERNATIONAL EXPANSION
- Facilitating access to EU-funded projects
- Supporting members’ export strategies
- Promoting the cluster and its members internationally

OUR MEMBERS ALSO BENEFIT FROM A FULL CALENDAR OF NETWORKING OPPORTUNITIES

Axelera Thursdays
One of our flagship events, our axelera thursday meetings attracted 500 attendees in 2013 and gave some 20 members a chance to promote their businesses through company presentations.

Online communications
- The Axelera extranet, reserved exclusively for members and financing partners
- An online member directory
- A monthly newsletter
- A weekly events bulletin (launched in 2013)
SUPPORTING INNOVATION

In 2013 we supported our members at every stage of the innovation process, providing targeted services covering everything from developing an innovation strategy, identifying potential projects, and managing projects to leveraging R&D to create business value.

INNOVATION STRATEGIES

4 information-packed breakfast meetings on innovation
- Tax rebates: an update on France’s Research Tax Credit and Young Innovative Company status (30 attendees)
- Innovation and SMEs (26 attendees)
- Presentations of the Rhône-Alpes regional government’s support programs for SMEs: “Innovation” (26 attendees) and “Financing” in partnership with the Tenerrdis energy cluster (24 attendees)
- Keeping your data secure (25 attendees)

Under our partnership with INPI (French Industrial Property Institute)
- 1 patent search initiated
- 3 free preliminary audits received by Axelera members
- Breakfast meeting on keeping your data secure (25 attendees)

TURNING IDEAS INTO PROJECTS

We helped identify and set up 7 projects that received backing from the French Single Interministerial Fund.
We partnered with non-profit association AIR to hold a workshop with brainstorming sessions on indoor air quality.

PROJECT LIFECYCLES

(including financing)

A taste for innovation (intercluster program on intellectual property) with 9 training sessions offered in Lyon and Grenoble (26 Axelera attendees in total)

MEMBER TESTIMONIAL

“Axelera helped us set up a collaborative R&D project, called COVKO, on air pollution remediation. With Axelera’s support, we were able to identify the right partners: seven regional businesses and three research labs. Axelera also provided a legal advisor and a project manager during the setup phase, and continued to provide day-to-day support. Without Axelera, we never would have been able to get the project off the ground.”

Didier Chavanon, CEO, BMES

VALUE CREATION

Project presentation days
- ACACIA project to improve the capture of industrial and anthropic CO2 (40 attendees)
- PCB-AIXELERA project on remediation of aquatic ecosystems contaminated by PCBs (100 attendees)

Project promotion at industry conferences
- Waste Meetings - Lyon, October:
  • TRIPTIC: trackers to optimize waste sorting technologies
  • PAREO: recycling technologies for polyamide motor vehicle components
- PCH Meetings - Lyon, March:
  • IREINE: process-integrated corrosion monitoring
  • INNOVAL: in-process on-line analysis
  • VALENTIN: industrial waste-heat recycling
Our business development efforts continued apace in 2013. We ran a number of initiatives to help our members get their innovations to market, promote the services and training offered by our partners, showcase our members at industry events, and help our members secure private-sector financing.

**GETTING INNOVATIONS TO MARKET**

**Partnership with EM Lyon business school (October)**

This partnership will give us access to EM Lyon’s innovation marketing know-how to:
- Improve our project development services
- More effectively support our members throughout their innovation projects

**The new Axelera Business Club (ABC)**

Set up in June 2013 by a 12-business working group, our new networking Club will focus on creating win-win partnerships among its members. Planned activities include knowledge-sharing on business issues and best practices, opportunities to identify potential synergies, and member promotion.

The Club’s first two meetings were held in June [at INSA Lyon] and October [at EM Lyon], with an average of 60 attendees. Overall, the Club counted more than 100 contacts (35 corporate and 50 SME) at year’s end.

**PARTNER SERVICES AND TRAINING**

**Breakfast meetings on the Rhône-Alpes regional government’s support programs for SMEs**

- Lyon [January] – Innovation (Axelera is a program partner): 26 attendees, and two Axelera member SMEs joined the program following the meeting
- Grenoble [February] - Financing (in partnership with energy cluster Tenerdis): 25 attendees

**Support for Axelera member SMEs by chemical-industry foundation FMC**

Offered in partnership with FMC, eight Axelera member SMEs in growth phase met with FMC consultants over four days; currently three SMEs and startups are receiving support from FMC.

**Business intelligence**

We are a partner of the business intelligence service set up by the Lyon Chamber of Commerce and the Greater Lyon intermunicipal authority with the support of the Rhône-Alpes regional government. The service is designed to give businesses in the Greater Lyon area the operational support they need to help them grow in their markets. Twelve Axelera member businesses used this service in 2013.

**MEMBER PROMOTION**

- **JEC Europe trade show (Paris, March):** joint booth under the Composites Rhône-Alpes banner, in partnership with Plastipolis and Techtera; 9 businesses exhibited at the booth
- **Pollutec Horizons (Paris, Dec.):** joint booth run by Axelera; 6 Axelera member SMEs exhibited (A3i Innovation, Arol Energy, Conidia, Explorair, Hemera, and Sorepol)

**PRIVATE-SECTOR FINANCING**

We signed a partnership with BNP Paribas in June.

BNP Paribas representatives attended our Axelera Thursday meetings and Axelera Business Club meetings.

**Innovative Cluster Company (Entreprise Innovante des Pôles, EIP) certification** Three Axelera members applied for certification.

"Since joining Axelera, our network of business contacts and new customers in the Rhône-Alpes region has really grown. In 2013 we exhibited at the Axelera booth at the Pollutec Paris trade fair and attended both Axelera Business Club meetings. Around 15% of our sales can be directly attributed to contacts made through Axelera."

Karim Medimagh, General Manager, Explorair
EXPANDING INTERNATIONALLY

In 2013 we helped our members submit proposals for EU projects, supported their export development strategies, and boosted our international reach for the benefit of our members.

BROADENING OUR HORIZONS ACROSS EUROPE

We became a partner of the European PPP SPIRE (Sustainable Process Industry through Resource and Energy Efficiency), which aims to foster partnerships in support of this emerging industry by issuing calls for proposals for R&D projects that are also tangible opportunities for Axelera members to expand their reach across Europe.

We pursued the EUROMATIERE program

This program helps SMEs set up EU projects cofinanced by the DGCIS (the French Economy Ministry’s division for economic competitiveness in manufacturing and services)

- 1 EU Brokerage Event: We attended an EU Brokerage Event in Strasbourg on the topic of “Nanotechnologies, Advanced Materials, Advanced Manufacturing, and Processing.” The event provided an opportunity to identify potential partners and emerging projects.
- 2 workshops: one on the Eco-Innovation 2013 call for proposals, and one on EU Horizon 2020 financing instruments for the theme "eco-technologies, waste, biodiversity, and risk.
- 3 Axelera member SMEs first-time partners in project proposals
- 1 Axelera member SME received first-time financing

We co-steered the EU SCOT (Smart CO2 Transformation) project (EU FP7) with Belgium’s GreenWin cluster.

SUPPORTING OUR MEMBERS’ EXPORT STRATEGIES

We took part in a fact-finding mission to Brazil on plant-based chemicals in February. The fifteen-member mission, spearheaded by Ubitrance (France’s export assistance agency) with the support of the DGCIS (the French Economy Ministry’s division for economic competitiveness in manufacturing and services), was a joint initiative of five clusters (Agrimip, Axelera, IAR, Fibres, and Xylafutur).

- Objective: Identify potential plant-based-chemicals technology and manufacturing partners in Brazil
- Main results: Thanks to meetings with businesses and research centers in the field of plant-based chemistry, participants were able to identify the key players in Brazil, become familiar with the country’s main innovation priorities (wastewater treatment, agricultural exports, plant-based chemicals, bioethanol, biotechnology and local process engineering needs, and bioconversion).

We spearheaded the joint “Composites Rhône-Alpes” booth at the JEC Europe trade show in Paris in March.

The joint booth, spearheaded by Axelera with the support of the Rhône-Alpes regional government, was an initiative of the members of Composites Rhône-Alpes (Axelera, Plastipolis, Techtera, and FEP-Composites). Seven regional SMEs took advantage of the opportunity to exhibit.

We hosted a team of experts from Belgium’s FISCH cluster in March.

Two FISCH representatives came to the Rhône-Alpes region to meet with three Axelera member companies, two research labs, and two clusters (Axelera and Trimatec).

- Main results: The FISCH representatives are particularly interested in our region’s know-how in separation, filtration, and purification methods for future EU-financed R&D projects.
The CEE Export program is part of Axelera’s International Development Plan (funded by the Rhône-Alpes regional government and backed by ERAI, the region’s international economic development agency). The program is also open to members of the Tenerrdis energy cluster. In 2013 a total of ten regional SMEs (including seven Axelera members) received customized advice from a coach on their export strategies. The coaching sessions included an audit, strategy development, and an action plan.

Rhône-Alpes Business Pavilion at the SIEE Pollutec trade show in Oran, Algeria in May.
- The purpose of the pavilion, an initiative of the Lyon Chamber of Commerce, was to give regional businesses operating in the environmental sector an opportunity to increase their export sales.
- 10 companies (including one Axelera member) exhibited.

Pollutec Oran 2013 trade show

Market research: Brazil
We completed research on Brazil’s development policies in 2013. The findings of our study enabled us to identify possible opportunities in key industries. The study also provided qualitative and quantitative data on the potential offered by priority markets.

Axelera branch office in China
From June to December, the branch manager worked part-time for three Axelera member SMEs.

RAISING OUR INTERNATIONAL PROFILE

2nd Franco-Chinese Congress on green chemicals in Lyon in January.
- 26 speakers (8 from China) and 80 attendees including several representatives of manufacturing companies.
- Topics: theoretical chemistry, catalysis, materials chemistry, recycling of agricultural waste and byproducts, new process development, and new lifecycle analysis methods.
A RESPONSIBLE MEMBER OF OUR COMMUNITY
TO SHAPE TOMORROW’S CHEMICAL AND ENVIRONMENTAL SECTORS

In 2013 we rolled out initiatives on three flagship issues affecting our sectors: skills development, communication, and societal challenges.

EDUCATION/TRAINING AND SKILLS DEVELOPMENT

We set up a "3.0" working group on education/training and skills development

- 14 members representing 6 educational institutions/training providers, 3 businesses, 1 research center, and 4 professional associations and trade unions
- The first meeting was held in December and the working group’s six-year plan was approved

Job aid on sustainable behaviours for the chemical and environmental industries

- The document was presented and distributed at three events in 2013:
  - The FST (Faculté de Sciences et Techniques) colloquium in Limoges, which was attended by Academic and Campus Life deans from universities in France and other French-speaking countries
  - The Forum Emploi Diversité job fair at Jean Moulin University, Lyon
  - The Ph.D. career fair at Claude Bernard University, Lyon
- The job aid, developed as a result of a R&D project set up and certified by Axelera, was used in the Claude Bernard University Master’s program in Industrial Analysis

Support for developing new educational and training programs

- We helped implement a new waste-to-energy educational program offered by engineering schools École Supérieure des Mines de St-Étienne and ISTP (Institut Supérieur des Techniques de la Performance)
- We sat on the Rhône-Alpes region’s education, training, and employment policy steering committee set up in 2013

COMMUNICATION AND OUTREACH

Rhône-Alpes Chemistry Village at the Mondial des Métiers career fair in February.

We helped man the Rhône-Alpes chemical industry booth at the Mondial des Métiers 2013 career fair. The booth featured four areas: one for labs and R&D; one for manufacturing; one for quality, safety, and environment; and one for HR and support functions. Our co-exhibitors included eight manufacturers (Adisseo, Air Liquide, Arkema, BASF, Bluestar Silicones, Novacap, Sëché, and Solvay), fourteen educational institutions and training providers, and Axelera. Our role was to promote research and innovation-related careers in the chemical and environmental sectors among the young people who visited the booth.

The Manufacturing and Innovation March in March

This travelling exhibit to promote France’s manufacturing industries covered 6,500 km and made 20 stops in cities across France and Germany. As a partner of the Lyon stopover alongside UIC (a chemical-industry federation), Arkema, Dehon, and Solvay, we showcased the benefits the Rhône-Alpes region has to offer the chemical and environmental sectors—and presented the best in innovation as demonstrated by our members’ collaborative R&D projects.
DRIVING
LOCAL ECONOMIC GROWTH

We rolled out a number of initiatives throughout 2013 to encourage investment in the Rhône-Alpes region.

We helped outline the regional government’s "smart specialization" innovation strategy for the chemical and environmental sectors.

We finished our Valchim study on industrial energy recovery opportunities in Chemical Valley. The study was carried out in partnership with the Greater Lyon intermunicipal authority and demonstrated the relevance of low-temperature waste-energy recovery for the region.

We began work on a possible common visual identity for Chemical Valley companies. The project is being carried out with innovative SME Visio Technic.

We held an Axeler Thursday meeting in November at the Greater Grenoble intermunicipal authority’s headquarters. The meeting featured presentations of three chemical parks in the Grenoble-Isère area: Roussillon-les-Roches, Pont-de-Claix, and Jarrie.

We co-organized tours of two regional chemical parks (Pont-de-Claix near Grenoble and Chemical Valley near Lyon) in November during the runup to the CIPEQ congress.

We met with local governments and economic development agencies across the region to promote our programs and services and to better understand their needs.

WE CONTINUED TO EXPAND AND IMPROVE OUR FLAGSHIP RESOURCES IN 2013.

The Axel’One collaborative innovation workspace with pilot plants for clean processes and innovative materials

• Our property development plans moved forward with: the construction of the pilot plant in St. Fons, the site opening in January, the rehabilitation of buildings at the Solaize site, and the selection of an architect for the future LyonTech-La Doua Campus center.
• Five small businesses moved in to the Solaize site
• The facilities hosted their first R&D projects in 2013

Institute for the Energy Transition (the IDEEL Institute for Excellence in Carbon-free Energy and the Factory of the Future)

• We signed an agreement with the ANR (French National Research Agency) in June, securing €40 million in public financing under the French government’s economic stimulus package
• We set up the Institute’s core resources: multi-scale digital simulation, industrial analysis, environmental assessment, and industrial ecology
• We launched initial partnerships with academic research labs
• The Institute represented 18 jobs (full-time equivalent) at end-December 2013
OUR MEMBERSHIP EXPANDED TO 281 ORGANIZATIONS
IN 2013

131 PMEs

- A2 PHOTONIC SENSORS
- A3I INNOVATION
- ACAVI
- ACTIVATION
- ACV PIUS
- AD MAJORS
- ADSCIENTIS
- AE TECH
- AIRPOLY
- AKTID
- ABEDCO ENERGIE
- ANALYTICAL PIXELS TECHNOLOGY
- AP2E
- ARJON ENERGY
- ASIATEC
- AUTOMATION DES PRODUITS DE SYNTHESE
- AVENISENSION
- AXEONE
- BCP INSTRUMENTS
- BIO-LOGIC
- BMES
- BRONIC TECHNOLOGIES
- BT3 TECHNOLOGIES
- CELSIUS
- CERAMIQUES TECHNIQUE ET INDUSTRIELLES
- CFD - NUMERICS
- CIGEOBIO
- COMPAGNIE EUROPEENNE DES TECHNOLOGIES DE L’HYDROGENE
- CONIDIA
- CONSULTANCY FOR ENVIRONMENTAL AND HUMAN TOXICOLOGY AND RISK ASSESSMENT
- CORETEC
- CT2MC
- CVEC
- ECO SOLUTION
- ECOAT
- ECOMESURE
- ECOMUNDO
- ER
- EUSI
- ENEA CONSULTING
- ENERTIME
- ENEO
- ENVISOY
- EUPR NATURE
- EUSI
- EVENA
- EXPLORAIR
- EXTRA SYNTHESIZE

FIBRE EXCELLENCE R&D KRAFT
FLUIDYN FRANCE
GIRUS
GIVALDAN LAVROITTE
GLOBAL PROCESS INDUSTRY
GLUCON VALVES
HEURO PROCESS
HEVERA
HYDREA
IDEL
INEO TECHNOLOGIES
INOPRO IAO
IONIOS
ISI INGENIERIE
ISO INGENIERIE
ITASCA CONSULTANTS
ITEN
IVA ESSEX
IWA
JACIR
JET METAL
KALLISTEM
KAPTEOS
LIZZ
LOTUS SYNTHESIS
MADEP MGC SERVICES
MECA FONCTION
MEDELPHARM
MESUREO
MIKEL
MTB RECYCLING
MULTI
NEOCARBONS
NEOFORMULA
CONSULTING & DEVELOPMENT
OASURE
ODHYS
ODEOTEC
ORELIS ENVIRONNEMENT
ORIGAYS ELECTROCHEM
ORION CHEMICALS METALCHEM
PAHNTOS
PARKO
PEGASTECH
PELICAN SELECTIVE TECHNOLOGIES
PHOTOCYCLE INDUSTRIES
PHOTORESTORE
PHYTOVALOR
POLE EUROPEEN DE PLASTURGIE
PROCESSM
PROOM
QUADRA 1
RECUPEL
REK
RHEONIS
RSA LE RUBIS
RYX
SAREM
SCIENCE ET SURFACE
SETARAM
INSTRUMENTATION
SETE MP
SHÉME
SISTIC
SMART INST
SOPHAN-O INDUSTRY
SOOREPOL
SYGEN
SRA INSTRUMENT
SVISS PROCESS SAFETY
TECHNIQUES SURFACES
ANDREZELIA
TECLIS
TERA ENVIRONNEMENT
THEIS ENVIRONNEMENT
TIGZ
TSI SPORT EQUIPMENT
VALORHIZ SARL
VIEWPOINT
VISO TECHNIC
YELEC CONSULTANTS
ZEDEL

73 large corporations and corporate subsidiaries

- ABB
- ACTEMIUM
- ADISSEO
- AIR LIQUIDE
- AIR PRODUCTS
- ALFA Laval
- ALUMINIUM PECHINEY
- ANTEA
- ARKEMA
- ARTEIA
- ATLANTIC CLIMATISATION ET VENTILATION
- BAICOVSKY
- BASF FRANCE
- BAYER
- BERTIN TECHNOLOGIES
- BLUESTAR SILOES FRANCE
- BOCCARD
- BOSCH RXKROTH
- BUREAU VERTAS
- BURGEAP
- CARBONE SAVOIE
- CEZUS
- CHILWORTH FRANCE
- CIETRAL
- COATEX
- CONDAT
- CYERGIE
- DEGRENRET
- DES PNEUMATIQUES MICHELIN
- DECOM
- DEXINDIEN
- DIEU
- ERAS INGENIERIE
- EUBIC
- EXTRACTECOTERRES
- GDF
- GE AEROSPIRAL ET SORAZMAT
- GERIFLO
- HARIAN LABORATORIES
- HXCEL COMPOSTES
- INVENTEC PERFORMANCE CHEMICALS
- IRH INGENIER CONSEIL
- KERNEOS TECHNICAL CENTER
- LAB
- LAFARGE CENTRE DE RECHERCHE
- LYONNAISE DES EAUX
- MANUFACTURE FRANCAISE DES PNEUMATIQUES MICHELIN
- NOVACAP
- NOVASEP PROCESS
- ONDEO INDUSTRIAL SOLUTIONS
- ORIL INDUSTRIE
- PERTHORPE
- PROTEUS
- PROTEX INTERNATIONAL
- PUPITRE INTERNATIONAL TEKOR
- SANOH - AVENTIS
- SCHNEIDER ELECTRIC INDUSTRIES
- SERPOL
- SHIMADZU
- SILAGES ENVIRONNEMENT
- SINTERTECH
- SIRASPPR INDUSTRIES RHÔNE-ALPES
- SITA REVISION
- SITA UP
- SNF
- SOCIETE D’INNOVATION ET DE TECHNOLOGIE DE LYON
- SOFRESID ENGINEERING
- SOLEILS BEACH-HY
SOVAY
SPE SUDEST
SUEZ ENVIRONNEMENT
TERAL
TREDI
VEOLIA EAU

50 R&D centers
- ARMINES
- ARTS (ASSOCIATION OF SCIENCE AND TECHNOLOGY RESEARCH)
- BORDEAUX INSTITUTE OF MECHANICS AND ENGINEERING
- BRGM (CENTRE FOR RESEARCH ON MINERALS AND MINING)
- CEA GRENOBLE - IRSV
- CEA GRENOBLE - LETI
- CEA GRENOBLE - LITEN
- CED2 (CHEMICAL, ENVIRONMENTAL, AND SUSTAINABLE DEVELOPMENT RESEARCH CENTER, PART OF THE CARNOT INSTITUTE)
- CERMAV (PLANT MACROMOLECULAR RESEARCH CENTER)
- CETIAT (THERMAL DYNAMICS AND AIR FLOW RESEARCH CENTER)
- CMGD (BROAD-DIFFUSION MATERIALS RESEARCH CENTER)
- CNRS (FRENCH NATIONAL SCIENTIFIC RESEARCH CENTRE)
- CISTB (BUILDING & CONSTRUCTION INDUSTRY RESEARCH CENTER)
- CTC (LEATHER INDUSTRY ECONOMIC DEVELOPMENT ASSOCIATION)
- CTP (PAPER-INDUSTRY R&D CENTER)
- CVG (CARBOHYDRATE AND NATURAL COMPOUNDS RESEARCH CENTER)
- ENS LYON CHEMISTRY LABORATORY
- ENSWASE - SPIN CENTER (CENTER FOR THE STUDY OF INDUSTRIAL AND NATURAL PROCESSES)
- EUROPEAN SYNCHROTRON RADIATION FACILITY (ESRF)
- FCBA (TECHNOLOGY INSTITUTE FOR WOOD
- CELLULOSE FOR CONSTRUCTION AND FURNITURE)
- HYDRAZINES AND HIGH-ENERGY POLYNITROGENOUS COMPOUNDS (ICBM)
- MACROMOLECULAR AND SUPERMOLECULAR CHEMISTRY AND BIOCHEMISTRY INSTITUTE
- ICFE (UNIVERSITY OF CLERMONT-FERRAND CHEMISTRY INSTITUTE)
- IFP (POLYMER MATERIALS ENGINEERING LABORATORY)
- INGÉNIERIE©LYON INSTITUTE FOR FREE-RADICAL CHEMISTRY
- IRCI©LYON (LYON CATALYSIS AND ENVIRONMENTAL RESEARCH INSTITUTE)
- IRSTEA
- ITRC (OILS AND FATS RESEARCH INSTITUTE)
- LAGEP (PROCESS ENGINEERING AND AUTOMATED SYSTEMS LABORATORY)
- LAMCOS (CONTACTUAL AND STRUCTURAL MECHANICS LABORATORY)
- LCP (POLYMERS, CATALYSIS, AND CHEMICAL PROCESSES LABORATORY)
- LECA (ALPINE ECOLOGICAL LABORATORY)
- LEGI (GEOPHYSICAL AND INDUSTRIAL FLOW LABORATORY)
- LEM (MICROBIOLOGICAL ECOLOGY LABORATORY)
- LEPW (LAbORATORY FOR THE PHYSICS, CHEMISTRY, AND ELECTRONICS OF MATERIALS AND INTERFACES)
- LGPP (PAPER PROCESS ENGINEERING LABORATORY)
- LOCIE (INSIA LYON’S CIVIL AND ENVIRONMENTAL ENGINEERING LABORATORY)
- LOCIE (ENVIRONMENTAL ENGINEERING AND DESIGN OPTIMIZATION LABORATORY)
- LRGP (PROCESS ENGINEERING AND CHEMICAL REACTIONS LABORATORY)
- LSA (ANALYTICAL SCIENCES LABORATORY)
- LET LAB (URBAN POLLUTION MATTERSCIENCE)
- IMPACTS ON AQUATIC AND TERRESTRIAL ECOSYSTEMS
- LUMIèRE INSTITUTE FOR MATERIALS MATEIS (MATERIALS SCIENCE AND ENGINEERING LABORATORY)
- SCA (CNRS CENTRAL ANALYSIS DEPARTMENT)
- UC3 (SOLID-STATE CHEMISTRY AND CATALYSIS LABORATORY)
- UNIVERSITY OF SAVOIE VIRPATH

12 educational and research institutions
- COMPÉGNE TECHNICAL UNIVERSITY
- CPE LYON (LYON SCHOOL OF PHYSICS AND CHEMICAL AND ELECTRONIC ENGINEERING)
- ÉCOLE CENTRALE DE LYON
- ÉCÔLE NATIONALE SUPÉRIEURE DES MINES DE SAINT-ETIENNE
- ÉNS LYON (LYON SCHOOL OF SCIENCES AND THE HUMANITIES)
- ÉNS LYON (LYON SCHOOL OF SCIENCES AND THE HUMANITIES)
- FGNOBLE ISÈRE ECONOMIC DEVELOPMENT AGENCY
- HAUTE SAVOIE GENERAL COUNCIL
- LYON AREA ECONOMIC DEVELOPMENT AGENCY (ADERLY)
- EUROPEAN INSTITUTE FOR INNOVATIVE PROCESSES (MEPI)
- RHÔNE-ALPES INTERNATIONAL ECONOMIC DEVELOPMENT AGENCY (ERAI)

1 financing partner
- BNP PARIBAS

5 education/training organizations
- AFPA
- CESI RHONE ALPES
- EM4 BUSINESS SCHOOL
- INTERFORA FAIP
- ISTP

9 economic development agencies and industry associations
- AXEL’ONE
- ENVIRON AIP
- ENVIRONMENTAL SECTOR JOB PLACEMENT AGENCY
- FRENCH INDUSTRIAL RISK INSTITUTE (INERIS)
- FRENCH PLANT-BASED CHEMISTRY ASSOCIATION (ASSOCIATION CHIMIE DU VEGETAL)
- GRENOBLE-ISÈRE ECONOMIC DEVELOPMENT AGENCY
- HAUTE SAVOIE GENERAL COUNCIL
- LYON AREA ECONOMIC DEVELOPMENT AGENCY (ADERLY)
- EUROPEAN INSTITUTE FOR INNOVATIVE PROCESSES (MEPI)
- RHÔNE-ALPES INTERNATIONAL ECONOMIC DEVELOPMENT AGENCY (ERAI)

1 financing partner
- BNP PARIBAS
AXELERA FOUNDING MEMBERS

ARKEMA
GDF Suez
IFP Energies nouvelles
SOLVAY

WITH THE SUPPORT OF

Innovation Cluster for the Chemical and Environmental Sectors
Serving Lyon and the Rhône-Alpes Region
Cité des Entreprises • 66 avenue Jean Mermoz • 69351 Lyon Cedex 08 • France
Tel. +33 4 78 77 83 64 • Fax +33 4 72 78 86 78
www.axelera.org • info@axelera.org