PROJECTS THAT CONNECT
VALUES THAT UNITE
A NETWORK THAT WORKS

2014 ACTIVITY REPORT
MESSAGE
FROM THE CHAIRMAN

Dear members and partners,

We embarked on the second year of our new strategic roadmap in 2014, making measurable progress towards our goals of value creation and international development over the course of the year. The Axelera Invest Club, which helps our members connect with private-sector financers, and the European Cluster Management Excellence Gold Label are just two of the many achievements we are pleased to report for 2014.

Axelera’s growth also continued to gain traction in 2014, with 30 new R&D projects certified by the cluster. These projects covered the full scope of our five strategic R&D areas and secured financing from regional, national, and EU organizations. We were also happy to welcome a record 48 new members, bringing our membership to more than 300. Three quarters of our members are now businesses and nearly half are small to mid-sized businesses. In 2014 we provided all of our members with a broad range of services developed to meet clearly-identified needs. These included three trips abroad for trade events and meetings, four joint booths at trade shows, and fourteen major events that attracted 1,200 attendees.

As the cluster enters its tenth year, the time is ripe to look back on our track record and assess our impact on the chemical and environmental sectors. More than ever, Axelera is poised to play a key role in developing the products of the future. By helping identify and set up R&D projects in promising fields and continuing to coordinate a network of excellence spanning the region, France, and beyond, we at Axelera are committed to helping our members’ innovations reach the marketplace.

It is with pride that I share with you the Axelera 2014 Activity Report and look forward to achievements yet to come.

Bruno Allenet, Chairman
For the second year in a row, Axelera continued to build on its 3.0 strategy for value creation and international development. This innovative strategic vision generated strong growth for our cluster in 2014, pushing our membership beyond the 300 mark. We also received the European Cluster Management Excellence Gold Label.

**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.

**Network**

- **302 members**, 76% are businesses and half are SMBs
- **5 founding members**: Arkema, the French National Center for Scientific Research (CNRS), Engie/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

**Projects**

- **232 R&D projects** certified by Axelera and financed for a total of €725 million
- **30 new projects** in 2014

**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
HIGHLIGHTS
A FULL YEAR OF EVENTS

The year 2014 was a productive one for the chemical and environmental sectors, with twelve months of targeted partnership-building, 52 weeks of high-potential projects, and 365 days of exciting innovations!

JANUARY
01 Partnership agreement signed: Axelera and GreenWin join forces

Axelera Thursday
New Year’s edition, with lab tours at the French National Center for Scientific Research

Axelera present at the 13th National Cluster Day in Paris

Opening session of the “Discover Axelera” breakfast meetings

FEBRUARY
02 First session of the “A Taste for Financing” series on public funding for innovation

Axelera unveils its new brand identity

MARCH
03 Axelera partners with the PCH Meetings business convention, closing out the event with an Axelera Thursday international meeting

Axelera co-exhibits on the Composites Rhône-Alpes booth, at the JEC Europe trade fair in Paris

Axelera exhibits at the Pollutec trade show Pollutec in Oran, Algeria

APRIL
04 Axelera Business Club meeting

Second session of the “A Taste for Financing” series on fundraising for startups

MAY
05 Intercluster trip to the IFAT trade show in Munich with two Axelera members

Workshop on lignocellulose for innovative materials at the Center for Pulp and Paper Technology in Grenoble

JUNE
06 Axelera Thursday meeting hosted by Greater Lyon Intermunicipal Authority

EU SCOT project seminar organized by Axelera

Axelera receives European Cluster Management Excellence Gold Label

AXELERA
catalyseur de croissance durable
SEPTEMBER

Axelera Thursday at the Cité du Design in St. Etienne and tour of the Design Map exhibit and materials library

Axelera partners with the Atmos’Fair international conference on air quality in Lyon

Axelera partners with the CO2 Forum, which ended with a panel discussion co-organized with EU SCOT project partners

JULY

TRIPLE and VALEE project presentation day co-organized by Axelera and Plastipolis

Jean-Manuel Mas appointed Director of Axelera

AUGUST

Second Axelera-GreenWin partnership steering committee meeting and meetings with GreenWin members in Belgium

Third session of the “A Taste for Financing” series on crowdfunding and angel investors

OCTOBER

Technical conference on liquid foam co-organized by Axelera and Teclis Instruments

Axelera partners with the Appel des 30 Greater Lyon chemical park initiative

Seminar on the chemical industry and sustainable construction organized by chemical-industry federation UIC with Axelera in Paris

NOVEMBER

Axelera Invest Club initiated and partnership agreements are signed with two regional investment funds

Axelera helps kick off the EUROTECH project to support small- and mid-sized business’ international development strategies

Axelera Thursday at the Roches-Roussillon chemical park, with tours of the Adisseo and Novapex plants

Trip to Belgium and the Netherlands to tour the Bio Base Europe collaborative innovation center and the Chemelot Campus and meet with local stakeholders

DECEMBER

Axelera joint exhibit booth with ten member companies at the Pollutec Lyon trade show

Axelera supports Kerneos in organizing the PARC Club for compaction- and agglomeration-based recycling of particulate matter

Axelera signs partnership agreement with Morocco’s Office Chérifien des Phosphates (OCP), the world’s leading producer of phosphate rock and phosphoric acid
2014 AN OUTSTANDING YEAR

One look at the key figures from 2014 is enough to tell you that the chemical and environmental sectors—and Axeler—are growing, with a focus on sustainable growth, value creation, and, increasingly, international development.

30 projects certified by Axeler and funded, including ten by the French Single Interministerial Fund

45% of Axeler’s members are engaged in ongoing joint R&D projects

48 new members joined Axeler in 2014

210 mentions in the press, half of which were in regional publications

10 press releases
3 Axelera Business Club meetings

5 Axelera Thursday meetings
   including 3 hosted by Axelera partners

8 tours of manufacturing plants, research labs, and educational and training organizations

9 “A Taste for Innovation” meetings and workshops in Lyon and Grenoble

10 technical conferences
   organized or co-organized by Axelera, including 1 project presentation day

4 “A Taste for Financing” sessions

2 partnership agreements
   signed with international partners

1 “Discover Axelera” breakfast meeting

3 international trips
   (Brazil, Germany, Belgium)

4 trade shows and industry events
   attended as exhibitor, either individually or with partners/members

ONLINE

42,753 visits
   to the Axelera website, including 63% new visitors

14 editions of the Axelera Newsletter
   published in French and English

76 news briefs
   published on the Axelera website

3,228 subscribers
   to the monthly newsletter (at December 2014)

39 weekly events bulletins published
In 2014 we continued to roll out the 3.0 roadmap launched in 2013. We maintained a sharp focus on value creation and international development while helping businesses implement market-driven innovation strategies.

### 3.0 roadmap alignment with Axelera stakeholders in 2014

#### LINKS TO NATIONAL AND REGIONAL INNOVATION POLICIES
- We participated in an innovation work group for the strategic committee on chemistry and materials
  - Seminar on the chemical industry and sustainable construction organized by chemical-industry federation UIC in partnership with Axelera
- We presented at the CSF/AFNOR seminar on the circular economy
- We presented at the Bpifrance “Sustainable Factory” seminar, part of the French government’s sustainable manufacturing policy
- We contributed to the implementation of the Rhône-Alpes regional “Smart Specialization” innovation strategy
  - Axelera led several work groups in the field of smart specialization (industrial processes and eco-efficient factories)

#### LINKS TO INDUSTRY-SPECIFIC INNOVATION RESOURCES

- **AxelOne**
- **IdeeL**
- **GreenWin**
- **Techtera**
- **Plastipolis**
- **Tenerdis**
- **Viameca**

#### LINKS TO OTHER CLUSTERS
- We exhibited at Composites Rhône-Alpes with clusters Techtera and Plastipolis
- We are engaged in Eurotech Rhône-Alpes (EU program for technological partnerships) with Techtera, Minalogic, Tenerdis, and Viameca
- We conducted an international benchmark study of clusters in partnership with the GreenWin cluster

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### Focus on Innovation

In 2014, the cluster’s strategy addressed all stages of the innovation process.

#### PROJECT FACTORY REMAINS A PILLAR OF THE CLUSTER’S STRATEGY
- We overhauled the committees that oversee our five strategic R&D areas
- We organized technical workshops, with priority given to disruptive technologies, to encourage new projects
- We diversified our sources of funding, in particular by bringing in EU projects under the Horizon 2020 framework

#### PRODUCT FACTORY RAMPS UP, LEVERAGING INNOVATION TO CREATE VALUE
- We monitored all R&D projects, in particular following their completion
- We promoted projects by organizing presentations and helping businesses through the tech-transfer process
- We strengthened our relationships with tech-transfer consultants
In 2014 the Axel’One Innovative Materials Platform (PMI) opened its doors while the Innovative Processes Platform (PPI) expanded its premises. Collaborative R&D projects were launched, and shared resources were made available to users.

A collaborative innovation workspace

In 2014 the Axel’One Innovative Materials Platform (PMI) opened its doors while the Innovative Processes Platform (PPI) expanded its premises. Collaborative R&D projects were launched, and shared resources were made available to users.

- 3 French Single Interministerial Fund projects certified by Axelera (VALCO II, SMOUSSIF, and SMILE) were funded and oriented to Axel’One; 4 projects are in the process of being set up with IDEEL
- We joined four foundational projects: Carnot Filière Chimie Matériaux, Sysprod (CPER), Chemical Valley Master Development Plan, and Composites Rhône-Alpes
- The Axel’One PMI site opened in April, and provided premises for several small businesses and collaborative projects led by Solvay and Bluestar Silicones. The site, located in St. Fons, was inaugurated in September

Inauguration of the Andésite building on the PPI site. Built by IFP Énergies nouvelles, this new facility adds 800 sq. meters of office space and laboratories

Laboratory activities launched on the PPI and PMI sites

Validation of the final pre-project plan for the Axel’One Campus (construction to begin in fall of 2015)

Axel’One PMI ribbon-cutting ceremony

- small businesses (Lactips, E-Xstream, Skinjay, Mecanium, Hemera, Separative) set up offices at Axel’One PMI under an economic revitalization plan signed with the French government
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AXEL’ONE & IDEEL: ATTRACTING BUSINESSES TO THE RHÔNE-ALPES REGION

Created by Axelera, the Axel’One collaborative innovation workspace and the IDEEL Institute for the Energy Transition continued to grow, helping to support economic development and bring new businesses to the Rhône-Alpes region.

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**INNOVATION PROJECTS**

**2014: A BANNER YEAR FOR VALUE CREATION**

In 2014 Axelera certified and helped secure funding for 30 R&D projects.

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<thead>
<tr>
<th>Project</th>
<th>Lead</th>
<th>Description</th>
<th>Funding program*</th>
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<td><strong>RENEWABLE RAW MATERIALS</strong></td>
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<tr>
<td>Green Epoxy</td>
<td>Protéus PCAS</td>
<td>Non-toxic epoxy resins from forestry-industry biomass for applications including floor coverings, food, and industrial paints</td>
<td>FUI 18</td>
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<tr>
<td>Bio3</td>
<td>Fibres excellence</td>
<td>Biorefinery to recycle wood by-products, and in particular the sugars in deciduous trees (without breaking down the cellulose), using eco-efficient processes</td>
<td>FUI 19</td>
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<tr>
<td>GreenAlgyOhol</td>
<td>Ceva</td>
<td>Proof-of-concept and sustainability assessment to determine the potential of macroalgae for bioethanol production</td>
<td>ANR</td>
</tr>
<tr>
<td>1000Cazymes</td>
<td>Cernav</td>
<td>Functional screening of the enzymes that break down a broad range of polysaccharides, including unclassified and putative</td>
<td>ANR</td>
</tr>
<tr>
<td>Briio</td>
<td>Condat</td>
<td>Effective bio-based (wood by-products) substances that do not harm the environment or human health for use in building insulation materials</td>
<td>FUI 18</td>
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<td><strong>ECO-EFFICIENT FACTORIES</strong></td>
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<td>RAMGas II</td>
<td>AP2E</td>
<td>Industrial gas analysis by Raman spectroscopy</td>
<td>FUI 19</td>
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<td>Ozone 2020</td>
<td>SUEZ Environment</td>
<td>New process for using ozone instead of the traditional method using toxic substances to disinfect biological substances</td>
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<td>Lignarocat</td>
<td>IRCE Lyon</td>
<td>Catalytic lignin conversion to aromatics</td>
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<td>Orca</td>
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<td>Organic redox catalyst for tomorrow’s diesel-powered vehicles</td>
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<td>MigroCat</td>
<td>ICBMAS</td>
<td>Migratory catalytic cross-coupling</td>
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<td>Azap-CO2</td>
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<td>Azaphosphatrines in confined space for CO2 conversion</td>
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<td>MemChem</td>
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<td>Processes using innovative membranes for more sustainable production of fine chemicals</td>
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<td>Slimcat</td>
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<td>Molecular-scale solid-liquid interface for catalysis</td>
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<td>Aca</td>
<td>Kerneos</td>
<td>New-generation products (mineral powder as an alternative raw material) for the construction industry</td>
<td>Bpi ISI</td>
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<td>Cyclops</td>
<td>Smart INST</td>
<td>An eye in the reactor for access to the core of complex processes</td>
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<td>Transalg</td>
<td>Ferrmanalg</td>
<td>Fermentation-based processes to convert by-products from the farming and pulp and paper industries into substances for the chemical and energy industries</td>
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<td><strong>CHEMICALS AND MATERIALS FOR MANUFACTURING INDUSTRIES</strong></td>
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<td>Noformol</td>
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<td>Repeat II</td>
<td>Hutchinson</td>
<td>Development of new telechelic polyethylene compatibilizers (bifunctional) and applications</td>
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<td>Hecate</td>
<td>Tours University</td>
<td>High-performance alternative piezoelectric materials towards more environmentally-friendly solutions</td>
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<td>Placelmat</td>
<td>Solvay</td>
<td>Self-plastifying cellulose derivatives: innovative new materials from environmentally-friendly and sustainable resources, chemicals, and processes</td>
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<td><strong>RECYCLING AND RECYCLABILITY</strong></td>
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<td>Vulcain II</td>
<td>Recupyl</td>
<td>A recycling process for automobile shredder residue</td>
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<td>Taranis</td>
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<td>Recycling of special steel and stainless steel slag processing by-products</td>
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<td>Trisur</td>
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<td>Better sorting for more effective reuse or recycling of strategic metals in spent catalysts</td>
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<td>Vdeo</td>
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<td>Classification-based recycling of high-UHV (lower heating value) waste from SRF (solid recovered fuel) production</td>
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<tr>
<td><strong>PRESERVATION AND RESTORATION OF NATURAL AND URBAN AREAS</strong></td>
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<td>Mads</td>
<td>Hydrokia</td>
<td>Control, predict, and detect hydrogen sulfide formation</td>
<td>Innov’R</td>
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<td>Site</td>
<td>Sorepol</td>
<td>Development and commercialization of floating pollution recovery systems</td>
<td>Innov’R</td>
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<td>Bioscale</td>
<td>Biomaie</td>
<td>Development and field testing of in situ biosurveillance systems</td>
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<td>Atlantide</td>
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<td>Esper</td>
<td>Bargeap</td>
<td>Assessment of the sensitivity of organic pollutant forecasting and remediation models</td>
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<td>Cappai</td>
<td>Bargeap</td>
<td>Methods to characterize the impact of gaseous pollutants</td>
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</table>

*FUI: (Fonds unique interministériels) French Single Interministerial Fund • ANR: (Agence nationale de la recherche) French National Research Agency • ADEME: (Agence de l’Environnement et de la Maîtrise de l’Energie) French National Environmental and Energy Agency • Gesipol: ADEME fund for the development of integrated site de-pollution solutions • Bpi ISI: Bpifrance, the French national investment bank, support fund for innovations deemed strategic to France’s manufacturing economy • Eurostars: EU program to support SMEs in the development of rapidly marketable innovative products, processes, and services that help improve the daily lives of people around the world. PSPC: A foundational project deemed sufficient in scope to shape the emergence of new industries • Innov’R: Rhône-Alpes regional eco-innovation program • CMI: The global innovation competition of Bpifrance.

*See end of table for definitions.*
Axelera’s five priority R&D areas provide a framework for the diverse range of R&D projects and other initiatives that are supporting growth for the cluster, our members, and partners—and across the chemical and environmental sectors.

1. RENEWABLE RAW MATERIALS

INITIATIVES

Workshop on lignocellulose for innovative materials
at the Center for Pulp and Paper Technology in Grenoble in March organized by Axelera in conjunction with regional innovation and R&D agency ARDI.
- 14 speakers and 80 attendees (major manufacturing corporations, startups, research labs) discussed lignocellulose-based biomass and the various opportunities in the field of materials

Workshop on recycling tannin for materials; tour of the dry fractionation plant at IATE (Ingenierie des Agropolymères et Technologies Emergentes)
- Organized in November in Montpellier with clusters Qualiméditerranée and Xylofutur
- 20 attendees from the grape, wine, wood, and chemical industries met to discuss tannin recycling opportunities in the field of materials

PROJECT
PROJECT COMPLETED IN 2014

NESOREACH*
A new rational predictive toxic solvent substitution method.
- Partners: Institut de Chimie et Biochimie Moléculaires et Supramoléculaires (ICBMS, lead), Laboratoire des sciences analytiques (LSA), Service Central d’Analyse (SCA), IVA-Essex
- Budget: €3 million, including €1 million in public financing
- Duration: October 2009–June 2014
- Results:
  > A database of 236 common solvents
  > A reliable method for recommending alternatives to toxic solvents
  > A new quantitative analysis method for polymers by MALDI-TOF mass spectrometry
  > Solvent selection based on lab testing for a manufacturer (to replace phenol/cresol used in PAI and PEI synthesis)

*SUCROL*
A lignocellulose biorefinery for the simultaneous production of cellulose and pentose for environmentally-friendly surfactants.
- Partners: Laboratoire Génie des Procédés Papetiers (lead), Fibre Excellence, SEPPIC
- Budget: €823K, including €284K in public financing
- Duration: December 2010–January 2014
- Results:
  > Proof that extraction of a significant amount of sugars from deciduous woods in parallel with quality cellulose production is possible
  > The liquors extracted, made up mainly of sugars (in the form of monomers and oligomers), were successfully used to produce surfactants
  > The sugars extracted were in a form that is compatible with surfactant synthesis and can be used to replace fossil-based surfactants; unlike other recent developments in this area, these bio-based surfactants are not dependent on food crops as a source of sugar

*Financed by the French National Research Agency/CD2ICP2D
PROJECTS
PROJECTS COMPLETED IN 2014

INNOVAL*
Online, process-integrated analysis
- **Partners:** 5 SMBs (Avenisense, EIF, Ivesa, SRA Instruments, Sistec), 4 corporations (Arkema: lead; Bluestar Silicones, Solvay, Vencorex); 2 public enterprises (IFP Énergies nouvelles: lead, Armines); 2 public research labs (Institut des Sciences Analytiques: LSA, SCA)
- **Budget:** €9.4 million, including €4.2 million in public financing
- **Duration:** October 2010–March 2014
- **Results:**
  > Innovative online analyses of liquids and gases ($\mu$GC, $\mu$densimeter, TDL, and LIBS)
  > “Industrial Analysis” courses launched in September 2012 (Masters in Analysis and Testing)

PROCIP*
Project methodology for process intensification.
- **Partners:** 2 corporations (Solvay, Bluestar Silicones: lead); 1 SMB (Processium); 3 research labs (Laboratoire de Génie des Procédés Catalytiques, Laboratoire de Génie Chimique, Laboratoire Réactions et Génie des Procédés)
- **Budget:** €3.1 million, including €1.1 million in public financing
- **Duration:** January 2011–December 2014
- **Results:**
  > A database of more than 200 technology fact sheets for fast identification and comparison of traditional and intensified technologies
  > 9 temporary jobs (for the duration of the project); 1 job converted to permanent at Processium
  > 6 articles and 12 presentations

IREINE*
Corrosion monitoring for industrial process equipment.
- **Challenges:** safety, environmental responsibility, costs (and therefore competitiveness) were the major issues addressed by this project focusing on industrial equipment, a key concern of companies in Chemical Valley and manufacturing companies in general
- **Objective:** develop corrosion monitoring devices and services for industrial process equipment to meet the needs of the chemical and parachemical industries
- **Partners:** 3 corporations (Solvay: lead, Arkema, Mistras); 2 public enterprises (IFP Energies nouvelles, Armines); 2 SMBs (Oihagys, Cybernetix); 3 research labs (MATEIS, LEPMI, UTC)
- **Budget:** €5.18 million, including €2.3 million in public financing
- **Duration:** November 2010–October 2014
- **Certification:** Axelera, Pôle Fibres
- **Labellisation:** Axelera, Pôle Fibres
- **Results:**
  > Better, more actionable knowledge of the mechanisms that cause damage and how to measure them
  > New equipment (prototype to commercial product)
  > Industrial applications
  > Benefits of online monitoring in relation to the process confirmed

PARC*
Compaction- and agglomeration-based recycling of particulate matter.
- **Partners:** 4 SMBs (Quadra, Medelpharm, Itasca, Kerneos: lead); 2 research labs (Centre SPIN, CENTHI)
- **Budget:** €4.4 million, including €1.6 million in public financing
- **Duration:** June 2013–June 2017
- **Objectives:**
  > Refine the specifications for the compacted materials to be integrated into the process (cold for transportation and storage and hot for high-temperature reactions)
  > Develop a new compaction technology compatible with industrial scale-up

* Financed under the French Single Interministerial Fund 9th grant round

FOCUS: PROJECT COMPLETED IN 2014

ECO-EFFICIENT FACTORIES

INITIATIVES
- Axelera eco-efficient factory research area presented at PCH Meetings and Pollutec Lyon
- Valchim study on industrial energy recovery opportunities in Chemical Valley and Valenthin industrial waste-heat recycling project presented at Pollutec Lyon in December
- PARC project interest club launched in December
- Partnerships: SPIRE (Axelera attended a brokerage event in May and an info day in October in Brussels); PASI program for business-to-business synergies in the Grenoble area
### NEW FUNCTIONAL POLYMER MOLECULES FOR INDUSTRIAL APPLICATIONS

**Objective:**
Develop a synthesis process for new functional polymer molecules for industrial applications (as additives for thermoplastic resins).

**Challenges:**
The project leverages the research of Lyon-based lab C2P2 (Chemistry, Catalysis, Polymers, and Processes), where a catalytic process enabling reactive functions to be inserted at the ends of the polyethylene chains was developed. The resulting functional polyethylenes will be used to improve the dispersion of inorganic (nano) substances or pigments in the polymer matrices to give the bulk material different functions like anti-UV or fireproofing capabilities, or to alter the surface properties of the matrices. Ultimately, the project will pave the way for an intensified continuous process with the ultimate goal of achieving optimal cost and environmental impact.

**Partners:**
1 corporation (Hutchinson); 3 SMBs (Activation, Addiplast, Lotus Synthesis); 2 labs at Université Claude Bernard Lyon 1 (IMP, C2P2)

**Budget:**
€2.1 million, including €1 million in public financing

**Duration:**
42 months

**Certification:**
Plastipolis (certified), Axelera/Elastopôle (co-certified)

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### TECHNICAL CONFERENCE ON LIQUID FOAM

Co-organized by Axelera and Teclis and attended by 55 people, this conference gave Axelera members a valuable opportunity to learn about the broad array of applications for liquid foams, ranging from oil and gas, shock absorption, and radiological decontamination to food.

### SEMINAR ON THE CHEMICAL INDUSTRY AND SUSTAINABLE CONSTRUCTION

- Organized by chemical industry federation UIC in partnership with Axelera in October
- 40 attendees
- 7 topics for further exploration were identified as strategic by the Chemicals and Materials Strategy Committee; 4 of the topics were approved for program implementation (separating building structural and envelope materials; low-emissions cement; superinsulation; air quality)

### PROJECT

**PROJECT COMPLETED IN 2014**

**ASAP**
Enhanced (high oxygen and water vapor barrier), innocuous PVDCs for food and drug packaging

- **Partners:** SolVin France (lead); ICG (École Nationale Supérieure de Chimie de Montpellier); ICP (Université de Provence Aix-Marseille 1); C2P2 (Université Claude Bernard Lyon 1); LCP-UPMC (Université Pierre et Marie Curie Paris 6)
- **Budget:** €2.9 million, including €1.2 million in public financing
- **Duration:** January 2011–June 2014
- **Results:**
  > Packaging barrier performance was improved while maintaining good inertia with respect to contents
  > A new emulsion polymerization network was set up between SolVin and French universities resulting in new contracts
  > 6 articles published in scientific journals; 3 patent applications filed

*Financed by the French National Research Agency*
RECYCLING AND RECYCLABILITY

INITIATIVES

TRIPLE AND VALEE PROJECT PRESENTATIONS
- Presentation of results of these two flagship projects on sorting and recycling plastics recovered from end-of-life electrical and electronic equipment (60 attendees)

TECHNICAL CONFERENCE ON RECYCLING AND THE CONSTRUCTION INDUSTRY
- Day-long meeting organized in conjunction with regional construction-industry cluster Indura
- 80 attendees; 5 breakout brainstorming sessions

AXELERA REPRESENTATION
- CRECOF (France’s composite recycling committee)
- 2ACR (a non-profit uniting chemical-industry stakeholders around recycling issues)

FOCUS: PROJECT COMPLETED IN 2014

NOPTRIX*
New sorting alternatives using multi-energy X-ray technology
- Challenge: the recycling industry needs new technologies capable of improving sorting while maintaining high throughput
- Objective: the project assessed the suitability of a breakthrough X-ray spectrometry method leveraging CdTe technology for sorting applications. This new breed of detector opens the door to new signal processing approaches based on analyzing the spectral signature of each pixel for enhanced material detection
- Partners: Bertin Technologies (lead); Mytil; CEA Leti; Armines (for C2MA, a laboratory of the École des Mines d’Alès)
- Duration: December 2010–January 2014
- Results: simulations were completed to determine the optimal conditions for material detection experiments in the lab; a functioning model was built to test the technology in situ on a conveyor, with promising results on plastics containing bromine, for example

*Financed under the French Single Interministerial Fund 11th grant round

PROJECT

PROJECT FINANCED IN 2014

VULCAIN II*
A breakthrough innovation for treating automobile shredder residue
- Challenge: when end-of-life vehicles (ELVs) are shredded, a particular type of waste, automobile shredder residue (ASR) is produced. ASR accounts for 15% to 20% of the original material. Currently, incineration is the only way of disposing of this waste
- Objective: develop a new ASR treatment method leveraging a breakthrough alkaline hydrolysis process. This innovative process will limit the effects of combustion alone (total breakdown of organic material with no CO₂ emissions and retention of problematic emissions like bromine and chlorine). It will also facilitate recycling. Finally, the new treatment plants will require lower CapEx than traditional incineration, pyrolysis, and flotation plants
- Partners: recupyl (lead); Aristot; Derichebourg Environnement; Explorair; PBM; Grenoble Institute of Technology; Air Liquide France Industrie
- Budget: €2.2 million, including €1 million in public financing
- Duration: 36 months
- Certification: Axelera (certified); Trimtec (co-certified)

*Financed under the French Single Interministerial Fund 19th grant round
The Rhône-Alpes regional government established the Innov’R program to support SMBs seeking to develop innovative ecotechnologies.

**BIOSCALE**

Eco-toxicological monitoring of aquatic ecosystems

- **Challenge:** Under the EU Water Framework Directive, chemical and ecological status reports will be required for all water bodies. Water resource managers will have to measure priority contaminants in aquatic ecosystems and assess the ecosystems’ biodiversity. The existing testing methods will provide some of the necessary information, but not all of it.
- **Objective:** Bioassays can provide additional eco-toxicological information (by establishing the correlation between chemical contamination and toxicity). This project is focusing on the development of active biosurveillance tools for aquatic ecosystems using a calibrated and previously-genotyped freshwater shrimp, *Gammarus pulex*.
- **Partners:** Biomae (lead); Irstea

**MADS**

Control, predict, and detect hydrogen sulfide formation in city water networks

- **Challenge:** Hydrogen sulfide (H₂S) is a colorless, toxic, and potentially explosive gas that is denser than air. The formation of hydrogen sulfide in city water networks is a major issue. This project aims to develop a multi-parameter approach combining physical, chemical, and microbiological measurements.
- **Objective:** Determine the level of risk and predict the formation of hydrogen sulfide in city water networks; implement test monitoring at two sites in the Greater Lyon area.
- **Partners:** Hydreka (lead); Enoveo, Hemera
**STRENGTH IN NUMBERS**

**AN ACTIVE, STEADILY GROWING NETWORK OF MEMBERS**

Axelera’s membership grew once again in 2014, with 302 members at year’s end. Members benefit from a comprehensive lineup of services and targeted, facilitated networking crucial to their businesses.

**Key figures/members**

- 302 members at end-Dec 2014
- 48 new members in 2014

**Members by region (%)**

- Rhône-Alpes: 76
- Ile de France: 13
- Isère: 2
- Drôme: 2
- Ardeche: 6
- Others: 2
- Members from outside of France: 11

**Rhône-Alpes-based members by district (%)**

- Rhône: 55
- Isère: 25
- Drôme: 25
- Ardeche: 17
- Haute-Savoie: 11
- Ain: 11
- Savoie: 5

**Members by type of business (%)**

- Small: 47
- Mid-sized: 25
- Corporations and their subsidiaries: 17
- Corporations and their subsidiaries: 11

**New members by type of business (%)**

- Small: 44
- Mid-sized: 33
- Corporations and their subsidiaries: 19
- Corporations and their subsidiaries: 11

*At Axelera, a startup is defined as a company less than five years old with fewer than 30 employees and that is engaged in an innovation project set up through the cluster*
Network-building, Axelera’s hallmark

NETWORKING RESOURCES

Online member directory
In 2014, Axelera added a new multi-criteria search engine to its online directory. This advanced feature allows users to carry out targeted searches for cluster members. It also allows users to create their own directory which is automatically updated and filtered to fit their needs.

Events bulletin
This weekly bulletin summarizes all upcoming innovation, networking, business, and industry events as well as any calls for projects over the upcoming six weeks.

EXELERA THURSDAYS: OUR FLAGSHIP NETWORKING EVENT

5 Axelera Thursdays were organized with our partners (CNRS, Greater Lyon, Cité du Design in St. Etienne, and the Roches-Roussillon chemical park), including one to wind down the PCH Meetings business convention.

In preparation for its Thursday events, Axelera organized tours of three research centers (IRCELYon, ISA, and IRSTEa), an exhibit (“Design Map”), and two plants (Novasep and Adisseo).

In 2014, Axelera Thursdays welcomed more than 400 attendees.

“I like to keep abreast of the latest business and economic trends. Axelera’s tour of the Roches-Roussillon chemical park is exactly the kind of opportunity I am looking for. The Axelera Thursday meeting held after the tour gave me a chance to do some targeted networking and promote a promising Axelera member, an SMB, to the entire SEB innovation community.”

Nathalie Pecoul
Head of Polymers
SEB Développement

AXELERA THURSDAYS:
OUR FLAGSHIP NETWORKING EVENT

Online member directory
The Axelera newsletter provides readers with information on top stories, upcoming events, cluster life, new members, and articles focused on specific projects, members, or partners.

Extranet
A controlled-access service for members only. This portal provides users with contact information for cluster members, presentation slide decks from events, as well as a wide range of relevant and exclusive information.

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Nathalie Pecoul
Head of Polymers
SEB Développement
Axelera provides a full range of support services at all phases of the project lifecycle, from consulting, project engineering, and certification to financing. We can help businesses determine an innovation strategy; identify, set up, and manage projects; and transform new innovations into marketable products.

**Innovation strategy**

*“TOP SECRET” SERIES ON MARKET INTELLIGENCE*

*Using the internet to research the latest business trends and technologies*

You can’t make the right decisions unless you have up-to-the-minute information. Market intelligence can help you stay one step ahead in a fast-paced world.

This workshop was organized in partnership with the INPI (National Institute for Intellectual Property), the DGSE (General Directorate for External Security), and the Lyon Chamber of Commerce and Industry. The goal was to provide participating companies with best practices to help them in their search for relevant information on the internet (Lyon, 21 attendees).

**INPI-AXELERA CONVENTION**

- Three complementary preliminary IP audits were provided for Axelera members.

**Managing the project**

*THE “TASTE FOR INNOVATION” SERIES*

Lyonbiopôle, Minalogic, and Tenerdis now hold intercluster workshops to raise awareness about the intellectual property issues inherent to the kind of collaborative R&D projects coordinated by the clusters. In 2014, a new consulting service was implemented to help companies apply for French Single Interministerial Fund grants.

Services combine educational workshops and individual consultations with an IP lawyer. Partners engaged in R&D projects certified by Axelera also receive individual assistance negotiating consortium agreements.

- 9 workshops held in Lyon and Grenoble attended by 34 Axelera members
- 6 individual consultations for Axelera members
Promoting the results

PROJECT PRESENTATION DAY

TRIPLE & VALEEE

This event was organized in July by Axelera to present the results of the Triple & Valeee projects:
- Analysis of sources of end-of-lifecycle electrical and electronic equipment
- Recommended sorting technologies and methods
- Opportunities for recycling materials recovered from end-of-lifecycle electrical and electronic equipment

The event brought in 60 attendees; presentations and a poster session provided opportunities for the participants to network.

PROJECT PRESENTATIONS AT INDUSTRY EVENTS

PCH MEETINGS

In 2014, Axelera was once again partner to the PCH Meetings business convention. This latest edition was geared towards international development with the presence of several European partner clusters. Axelera was in the spotlight in the opening talk on eco-efficient factories. Our cluster was also able to promote two flagship projects: the EU SCOT project on smart CO₂ transformation and the LegiSecure project to develop operational solutions to comply with the new, tighter HVAC equipment regulations to prevent Legionnaire’s disease. PCH Meetings ended with a special international edition of our traditional Axelera Thursday meetings.

POLLUTEC LYON

Axelera ran a joint exhibit booth at the 26th annual Pollutec trade show. The booth, in the institutional section of the Rhône-Alpes Pavilion, once again gave ten Axelera members an opportunity to showcase their innovations (read more on page 21).

During the trade show, our cluster organized seven talks on topics related to ongoing R&D projects: SCOT (Smart CO₂ Transformation), Valchim (industrial energy recovery opportunities in Chemical Valley), Valenthin (industrial waste-heat recovery), and COV-KO (indoor air quality for sustainable cities).

“One of Axelera’s Innovation Project Coordinators helped the Trisur project win a CMI (Bpifrance’s global innovation competition) award for materials/rare metals recycling. Axelera’s help preparing the submission file and our presentation to the selection committee made the difference. Trisur, which is spearheaded by Eurecat in partnership with IFP Énergies nouvelles and the ISA (Institute for Analytics), aims to develop an ultra-fast solid-waste sorting system leveraging a LIBS-type detection technology capable of separating millimeter-sized grains based on their elementary composition.”

Pierre Dufresne
Head of R&D, Eurecat
At Axelera, we strive to get our members’ innovations to market. We focus on initiatives like training, trade show attendance, and assistance securing financing from the private sector to support economic development.

**Bringing innovations to market**

**AXELERA BUSINESS CLUB**

The Axelera Business Club (ABC) is the cluster’s main vehicle for doing business. Each meeting is unique, with a diverse range of topics on the agenda:

- Roundtable discussions between Club members
- Meetings with stakeholders from our members’ target markets
- Workshops
- Presentations of “in-demand” know-how
- Networking

ABC member directory is particularly useful in helping members build business relationships. We asked ABC participants to answer the following question: “Have you ever come away from an ABC meeting with a qualified business lead?” Their answers highlight the value of this event:

- On average, each ABC member comes away with three business leads at each ABC meeting.

**ABC KEY FIGURES:**

- 100+ contacts in the Club
- 50+ contacts from major companies and their subsidiaries
- 60+ SMB contacts
- 3 ABC meetings held in 2014 with an average of 68 participants
FOUNDER FOR ADVANCES IN CHEMISTRY SUPPORTS AXELERA SMB MEMBERS

Three Axelera members (two SMBs and a laboratory) were able to meet with experts from the Foundation for Advances in Chemistry (FMC) over two days. Currently, two startups are also receiving support from the FMC.

ECONOMIC INTELLIGENCE

Axelera is a partner of the Lyon Chamber of Commerce and Industry/Greater Lyon economic intelligence division. Backed by the Rhône-Alpes regional government, the division provides operational support to help businesses located in the Greater Lyon area grow. In 2014, eight cluster members worked with the division.

Promoting our members

- JEC Composites 2014 trade show: CT2MC
- Pollutec Lyon 2014 trade show: Apix Analytics, Cogebio, Condal, CT2MC, Envisol, Hemera, Inevo Technologies, Odotech, Pact-Snz, and Stral

Securing private-sector financing

“A TASTE FOR FUNDING” SERIES

We have created a workshop series entitled “A Taste for Funding” in partnership with BNP Paribas. The workshops bring an average of 25 attendees and provide cluster members with an insider look at the world of private-sector financing. The following topics were addressed in 2014:

- Public financing opportunities for innovation (CIR, CII, CICE, Bpifrance offers, bank matching loans).
- Fundraising for startups: dos and don’ts.
- Crowdfunding and angel investors: information from the source.

INNOVATIVE CLUSTER COMPANY LABEL

Axelera and the members of the Axelera Invest Club awarded Biomae and Ethera this label for innovative businesses.

“At Biomae, which is a startup in the field of toxicological monitoring of aquatic ecosystems, we were looking for investors to back our future business development and R&D plans. Axelera suggested we apply for the Innovative Cluster Company label to increase our chances. Our presentation to the Axelera Invest Club selection committee, which included Rhône-Alpes Création, earned us the label and, ultimately, won us €850,000 in funding from Rhône-Alpes Création, who we had already met with, as well as two other investment funds.”

Laurent Viviani
Head of Business Development
Biomae
Our 3.0 roadmap includes an ambitious international development plan that aims to strengthen our foothold in Europe and facilitate export sales for our member companies.

INTERNATIONAL DEVELOPMENT

EXPANDING AXELERA’S REACH

International meetings and conferences

UNITED STATES
- Topic: homogeneous and heterogeneous catalysis
- Participant: Catherine Pinel (IRCELYON)

CHINA
China International Battery Fair (CIBF) in Shenzhen, June 2014
- Participant: Farouk Tedjar (Recupyl)

NETHERLANDS
Eighth Interface Against Pollution (IAP) conference in Leeuwarden, May 2014
- Topic: study of interfaces for water and soil treatment
- Participant: Stéphane Daniele (Lotus Synthesis/IRCELYON)

HUNGARY
International Bio-Based Polymers and Composites (BiPoCo) conference in Visegrád, August 2014
- Participant: Lopez Cuesta (Winès d’Ales)

EUROTECH PROGRAM LAUNCH
Axelera partnered with Minalogic, Techtera, Tenerrdis, and Viameca on the Eurotech program in 2014. The program is designed to support SMBs in their international development by helping them apply for funding under European projects: H2020, Eurostars, specific instruments for SMBs, Interreg, etc.

SCOT (SMART CO₂ TRANSFORMATION) PROJECT
This collaborative project is funded by the FP7. SCOT was launched in April and brings together five European regions.
- Objective: to determine the EU’s strategic agenda for CO₂ transformation
- 2 primary missions in 2014: Assess the current state of the art in CO₂ recycling in Europe; inventory the key stakeholders (project coordinated by Axelera); complete a socioeconomic analysis of the main CO₂ recycling paths (project coordinated by the University of Sheffield)
- 2014 SCOT events in the Rhône-Alpes region:
  > the “Carbon Dioxide Utilization in 2030” workshop provided an opportunity for experts on this subject to discuss the future of this sector in France and Europe
  > The international CO₂ Forum organized in September by CPE Lyon and backed by Axelera included a meeting dedicated to SCOT with over 80 participants

EUROPEAN DEVELOPMENT STRATEGY

EUROPEAN CLUSTER MANAGEMENT EXCELLENCE GOLD LABEL
In June, Axelera received this label from the European Cluster Excellence Initiative (ECEI), which is funded by the European Commission’s Directorate General for Enterprise and Industry. This label recognizes our cluster’s excellence in terms of strategy, governance, member services, and innovation development.

SPIRE PUBLIC-PRIVATE PARTNERSHIP
As part of the SPIRE (Sustainable Process Industry through Resource and Energy Efficiency) partnership, an EU Horizon 2020 initiative, Axelera participated in a brokerage event in May and an info day in October (Brussels, Belgium).
- Axelera shared information with its members about upcoming projects and joined a competency-search consortium
Supporting our members’ international expansion

SIEE POLLUTEC ORAN, ALGERIA: SHARED BOOTH FOR REGIONAL BUSINESSES
(project initiated and led by the Lyon Chamber of Commerce and Industry)

- Nine businesses exhibited, including one Axelera member (Girus)

Composites Rhône-Alpes
Partenaires R&D et collaboration

SHARED “COMPOSITES RHÔNE-ALPES” BOOTH AT THE JEC TRADE SHOW

The JEC trade show is the Composites Rhône-Alpes network’s premier event, and provides an opportunity for its member clusters (Axelera, Techtera, and Plastipolis) to showcase their know-how in composite parts design and manufacturing. The clusters’ shared objective is to promote the region’s expertise, be it industrial or academic, in the composites sector.

- The 2014 event united three clusters and ten of their members, including one Axelera member (CT2MC)

TRIP TO BELGIUM: GREENWIN CLUSTER

As part of the partnership agreement signed between GreenWin and Axelera in January, a trip to the GreenWin cluster was organized. Some highlights:

- GreenWin and Axelera partnership steering committee meeting
- Axelera participated in the BIC (Bio-Based Industries Consortium) working group organized by the GreenWin cluster
- A public-private partnership designed to accelerate economic development and create jobs, in particular in rural areas, by encouraging the development of biorefineries
- B2B meetings with three GreenWin members
- Visits to the Materia Nova and Certech research centers

INTERCLUSTER TRIP TO GERMANY DURING THE IFAT TRADE SHOW

Axelera and two of its members, BMES and Hemera, participated in the IFAT trade show in Munich. This trade show brings together professionals in the fields of water, waste, and recycling management. The 2014 edition attracted 135,000 visitors and 3,081 exhibitors.

The trip offered an opportunity to talk with chemical and environmental clusters in Bavaria, creating ties that will pave the way for future joint EU project submissions.

“Axelera’s advocacy earned Envisol a spot on French President François Hollande’s official trip to Canada in November of 2014. I got a chance to present Envisol to CEOs and decision makers in Canada as well as members of Quebec’s provincial government. I was also able to talk to top executives from some of France’s largest manufacturing corporations on the trip. I even got a brief chat with our President. Overall it was a valuable opportunity for our company, which specializes in engineering and consulting for polluted sites and soil remediation.”

Gael Plassart
Co-CEO, Envisol
FROM EDUCATION TO INNOVATION
CULTIVATING TOMORROW’S TALENT TODAY

One of Axelera’s major objectives in 2014 was to identify tomorrow’s most in-demand skills and know-how and build bridges between education and innovation.

1 Working group on education/training and skills development

This working group is made up of 14 members representing Axelera’s member categories and partners (SMBs, corporations, educational institutions, training providers, unions) from:

The education/training and skills development roadmap aims to achieve two objectives:
- Build bridges between education and innovation
- Identify the critical skills businesses will need tomorrow so that those needs can be met

Two subgroups were set up:

Support for PhD dissertation supervisors
- The purpose of this subgroup is to provide PhD dissertation supervisors with the support they need to improve the interpersonal skills (and thus the employability) of the PhD candidates they supervise.
- A selection of Axelera members concerned by this issue (PhD dissertation supervisors, PhDs, PhD candidates, doctoral schools, and businesses) were asked to complete a questionnaire to determine their needs.

Competency mapping to identify Axelera member business’ emerging needs
- The purpose of this subgroup is to determine what challenges Axelera member businesses are facing with regard to their medium-term recruitment needs (five-year horizon) and to identify trends.
- A group of 12 SMBs selected according to Axelera’s strategic pillars were asked to complete a survey and interviews with members of the subgroup.

2 Keeping educational and training programs up to date

Axelera supported several initiatives:
- Three degree programs were combined (two Masters degrees with concentrations in Risk and the Environment and a third Masters in Environmental Law); Axelera sat on the development committee, helping to identify lecture topics and possible speakers and workshop facilitators (including from SMBs). The partner institutions were: ECL, ENTPE, ENSME, INSA Lyon, UCBL, and Université de Lyon.
- The EU EACH project spearheaded by the Masters in Industrial Analysis and Testing of UCBL (under the Erasmus Mundus program).
- Axelera is a member of the steering committee for COEF, a regional program launched in 2013 to stimulate training, employment, and human resources development in the chemical and environmental sectors.

3 Job aid on sustainable behaviors for the chemical and environmental sectors

- The job aid was used in the Masters in Industrial Analysis and Testing of UCBL.
- The job aid was distributed to Axelera members and partners (businesses, students, professors).

Meeting of the working group on education/training and skills development
LOCAL ACTIONS THAT GET RESULTS
HELPING TO RAISE THE REGION’S PROFILE

Once again this year, Axelera rolled out a number of initiatives to help local governments across the region achieve their economic development objectives.

Axelera took part in the Rhône-Alpes regional government’s “Smart Specialization” Innovation Strategy.

We conducted a preliminary study for a project to develop an industrial brownfield site rehabilitation industry in the region.

We partnered with the Appel des 30 ! chemical park initiative [run by Greater Lyon] that aims to leverage existing commercial property to host the high-tech and other businesses that will form the cornerstone of tomorrow’s Chemical Valley.

Axelera is a partner of the Inspira project to further develop the Salaise-Sablons industrial park and river port with Economic Interest Group Osiris (which provides services at the Roches-Roussillon chemical park) and the PPP that runs Salaise-Sablons, GPRA Rhône Médian.

We are steering a project to create a visual identity for Chemical Valley in partnership with Visio-Technic.

Axelera Thursday meetings were held:
- at the Greater Lyon intermunicipal government headquarter
- at the Cité du Design in St. Etienne (preceded by a tour of the materials library and the Design Map exhibit)
- at the Roches-Roussillon chemical park (preceded by a tour of the Adisseo and Novapex plants).

Meeting with local government officials to present the cluster’s initiatives and services and to identify local policymakers’ needs (Isère, Savoie, and Loire General Councils; Plaine de l’Ain intermunicipal authority).

“Discover Axelera” breakfast meeting (attended by around 15 local businesses) in Savoie in partnership with the Savoie Economic Development Agency, innovation accelerator CRITT Savoie, and the Savoie Technolac high-tech business park.

Tour of the Roches-Roussillon chemical park.
OUR 302 MEMBERS AT DEC. 31, 2014
A TARGETED, UNITED, AND ACTIVE NETWORK

148 SMBS
Acavi
Activation
ADmajoris
Adscientis
Aelorve
Airpol
Akrid
Albedo Energie
AP2E
Apix Analytics
Arol Energy
Aspa Europisio
Atanor
Autolubrification des Produits de Synthèse (APS)
Automatique et Industrie
Avenirense
BGene Genetics
Biologic
Bioniaer
BM Environnement
B.H.E.S
Brochier Technologies
BT3 Technologies
Celsius
Céramiques Techniques et Industrielles (CTI)
Cld - Numerics
Cogebio
Comap
Compagnie Européenne des Technologies de l’Hydrogène
Condia
Consultancy for Environmental and Human Toxicology and Risk Assessment (CEHTRA)
Coretec
CT2MC
CVLC
Deltalys
Dense Fluid Degreasing
Drawn
Ecoat
EcoBatec
Ecomatec
EcoMundo
Eco’Ring
EFS
Egelis
Elf-Astute
Ellicyl
Emdelen
Emergancy
Enelime
Enenvio
Envisol
Epur Nature
Eras-labo
Ethera
Evea Conseil
Evagenerics
Ewam
Explorair
Extrasynthese
Fibre Excellence R&D Kraft
Fluidyn France
Genes’Ink
Givaudan Lavirote
Global Process Industry
Guichon Valves
Helioprocess
Hemera
Hexatech Engineering & Consulting
Hydrela
Ineed
Ino Technologies
Inpro Iao
Inventis
Ionica
Iso Ingénierie
Iso Ingénierisants
I-Ten
Ivea
Jacor
Jet Metal
Julien Lebourgearnos
Kallistem
Kaptecs
KepTechnologies high tech products
Kic IntEnergy
Kreatis
Laclips
Liliz
Lutos Synthesis
Medipharm
Mesureo
Mixel
Mrb Automatismes Industriels
Mt Recycling
Multix
Neoformula Consulting & Development
Oasure
Odylys
Odatach
Odiz Consultants
Orelis Environement
Origadys ElectroChem
Orixon Chemicals Metalchem
Pat Siz
Pehnitos
PGestech
Photocycle Industries
Phytoforest
Phyto-Valor
Pole European de Plasturgie
Processium
ProSim
Quadra 1
Recupyl
Res
Rheonis
Rheonova
Royaltain Research Company
Rpa Process
Ras le Rubis
Saheem
Separative
SATT Lyon Saint-Etiennne
Science et Surface
Selvert
Sete Mip
Setup Performance
Shiferm
Sipira
Sistec
SmartNST
Sorepol
Spygen
SRA Instruments
Stiral
Swiss Process Safety
Techniques Surfaces Andrezieux
Teclis
Tera Environnement
Theta Environnement
Tournaire
Tol Sport Equipment
Valorhhz sarl
Viewpoint
Visa Techric
Ytec Consultants

24 ETI
Antea
Artelia
Bluestar Silicons France
Boccard
Burgeap
Cevalal
Condat
Eras Ingenierie
Eurecat
Geffor
Girus
Inventec Performance Chemicals
Iva Essex
Kerneos Technical Center
Novacap
Novasep Process
Protek International
Rybi
Secamat Ingénierie Industrielle
Serpol
Sinteretch
SNF
Soprao Industry
Zedel

34 CORPORATE SUBSIDIARIES
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Adisseo
Atlantic Climatisation et Ventilation
Baikowski
Berin Technologies
Bosch Rexroth
Brankhorst
Bureau Veritas
Carbone Savoie
Cenntro Motors
Cezus
Chilworth France
Coates
Cybernetix
Cyfergie
Degremont
Hexcel Composites
Lab
Lyonnaise des Eaux
Ondeo Industrial Solutions
Oril Industrie
Protexus
Saint-Gobain Weber France
Shimadzu
SIRA-SARP Industries Rhône-Alpes
Sita Remediation
Sita Up
Sofresid Engineering
Soldata Geophysic
Solelantche Bachy
Tefal
Tredi
Vencorex
Veolia Eau
23 CORPORATIONS
ABB  
Air Liquide  
Air Products  
Alfa Laval  
Aluminium Pechiney  
Arkema  
BASF France  
Bayer  
Coveris  
EDF Centre d’Ingénierie de la Déconstruction et de l’environnement  
Engie  
GEA ERGE-Spiral et Soramat  
Hansco Minerals France  
Lafarge Centre de Recherche  
Manufacture Française des Pneumatiques Michelin  
Saint Gobain  
Sanofi Aventis  
Schneider Electric Industries  
Solvay  
Spie SudEst  
SUZE Environnement

49 R&D CENTERS
Armines  
Association de Recherche Technologique et Sciences (ARTS)  
Bureau de Recherches Géologiques et Minières (BRGM)  
CEA Grenoble (IRTSV)  
CEA Grenoble (LETI)  
CEA Grenoble (UJTEI)  
Centre de Recherche sur les Macromolécules Végétales (CERMAV)  
Centre des Matériaux des Mines d’Albi (C2MA)  
Centre Technique de l’Industrie des Papiers, Cartons et Celluloses (CTP)  
Centre Technique des Industries Automobiles et Thermiques (CITAT)  
Chimie, Catalyse, Polymères et Procédés (C2P2)  
ENSINSE – centre Spin  
Environ科学  
European Synchrotron Radiation Facility (ESRF)  
Institut de Chimie de Clermont-Ferrand (ICCF)  
Institut de Chimie et Biochimie Moléculaires et Supramoléculaires (ICBWIS)  
Institut de Chimie Radicatoire  
Institut de Mécanique et d’Ingénierie de Bordeaux (I2M)  
Institut de Recherche sur la Catalyse et l’Environnement de Lyon (IRCELYon)  
Institut des Corps Gras (ITERG)  
Institut des Sciences Analytiques (ISA)  
Institut Lumière Matière (IUM)  
Institut Polytechnique de Grenoble - INP PAGORA  
Institut Technologique Forest Cellulose Bois-Construction Aménagement (FCBA)  
IRSTEa  
Laboratoire Mécanique des Contacts et des Structures (LAMCOS)  
Laboratoire d’Automatique et de Génie des Procédés (LAGEP)  
Laboratoire de Chimie (IC-ENS)  
Laboratoire de Génie Civil et d’Ingénierie Environnementale (LOGIE)  
Laboratoire de Génie des Procédés Papetiers (LOGP)  
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Laboratoire d’Écologie des Hydrosystèmes Naturels et Anthropisés (LEHNA)  
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Laboratoire Génie Civil et Bâtiment (LOGCB)  
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École Nationale Supérieure des mines de Saint-Étienne  
École Normale Supérieure de Lyon  
École Supérieure Chimie Physique Electronique de Lyon  
Institut National des Sciences Appliquées de Lyon  
Institut Textile et Chimique de Lyon  
Université Claude Bernard Lyon 1  
Université de Lyon  
Université de Technologie de Compiègne  
Université Jean Monnet de Saint-Étienne  
Université Joseph Fourier de Grenoble département de chimie moléculaire

5 TRAINING CENTERS
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CNAM Rhône-Alpes  
EM Lyon  
Interfora Ifaip  
ISTP

11 ECONOMIC DEVELOPMENT AGENCIES AND INDUSTRY ASSOCIATIONS
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AEPI  
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Conseil Général de la Haute - Savoie  
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