



Alsace/Franche-Comté

« Green Mobility »
State of Play in the Region



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Abbreviations

KET	Key Enabling Technologies comprise technologies such as nanotechnologies, micro- and nanoelectronics including semiconductors, advanced materials, biotechnology and photonics.
RTDI	Research, Technological Development and Innovation
RDC	Research-driven cluster
ICT	Information- and Communication Technologies
SWOT	Strengths, Weaknesses, Opportunities and Threats
R&D	Research and Development
SME	Small and Medium-sized Enterprises
OEM	Original Equipment Manufacturer
EU	European Union
MS	Member State
ERDF	European Regional Development Fund
EV	Electric Vehicle
HEV	Hybrid Electric Vehicle
BEV	Battery Electric Vehicle
GDP	Gross Domestic Product
EFT	Equivalent Full Time

1 INTRODUCTION

The overall goal of **ELMOs – Electromobility Solutions for Cities and Regions** – is to promote more sustainable transport through the development of electromobility solutions for cities and regions. The project aims at delivering concepts for a better exchange of electromobility knowledge at regional and EU level, concepts for new business models and for cross-border field tests which should lead to an improved standardisation in electromobility technology and to new insights in applied science. The project therefore, contributes to enhance the regional capacities for a fostering of the sustainable transport-related economy.

Due to daily-congested roads in and around agglomerations with highly polluting stop-and-go traffic, electromobility with zero-emissions in cities will bring large and quick gains in greenhouse gas reduction and alleviation of air and noise pollution. Moreover, innovative green vehicle concepts will lead to new and sustainable mobility forms in urban mobility.

*“**Electromobility** includes all electric vehicles as well as plug-in hybrids in urban, sub-urban and rural areas. Range extenders are excluded.”*

However, a fast uptake of electromobility depends on appropriate regional infrastructures, a shift in user patterns, and intelligent vehicle-use concepts embedded in the urban transport environment. At first step towards the achievement of a modal shift for sustainable growth is to gather and analyse available knowledge in the regions as well as at the level of research-driven clusters (RDCs) and on EU level, and to conduct SWOT analyses to serve the formulation of joint research, policy actions and business strategies.

This State of Play report seeks to provide an overview of RTDI and Cluster Policies, Action Plans, R&D Infrastructures related to electromobility and to stimulate the debate on future «Green Mobility Solutions» that drive quality of life, competitiveness and sustainable growth in Alsace/Franche-Comté.

2 REGION & SECTOR

Alsace/Franche-Comté is one out of six territories across Europe joining forces to drive the uptake of green mobility solutions for cities and regions. To better assess the regional state of play in electromobility, some basic information on the region and automotive sector is presented in the following sections.

Overall comment

The regional analysis has been carried out not in one, but in two administrative regions, as the Pôle Véhicule du Futur cluster has been developed its activities in Alsace and Franche-Comté over the last 8 years. Indeed, more than 1,000 businesses related to the transport sector are recorded in the two regions. They are largely based in the Besançon to Strasbourg corridor, including Mulhouse and Montbéliard (PSA Peugeot Citroën headquarters) as major economic hotspots for the automotive industry.

This specific situation made the regional analysis more difficult since it implies duplication of work. Furthermore, thematic figures are not always comparably common in Alsace and Franche-Comté. For example, apart from national databases, some specific regional statistics may be related to different periods of time and don't always follow the same method of calculation, in regard to the existing literature. Adding up the numbers of the two regions might give a good overview but will lack the sufficient scientific rigour which applies to formal statistics.

In regard to Pôle Véhicule du Futur's spectrum of activities there are several sectors to be taken into account: automotive, ground transportation (including railway) and mobility services; this makes it more difficult to get accurate statistics. Furthermore some cluster members are not fully dedicated to the transport sector when they are providers of products or services for other business areas: health, aeronautics, energy, agro-food industry, civil engineering, etc.

In most French RTDI programmes, there is a lack of evaluation and monitoring processes publicly available. Thus it is very difficult to assess outputs and policy impacts against planned objectives since the beginning of the programmes.

2.1 Alsace/Franche-Comté – The Region at a Glance

The region **Alsace** is located in the east part of France. Bordered by Germany and two French regions (Franche-Comté and Lorraine), the region counts 1.85 million inhabitants for a total surface and density of respectively 8 280 km² and 220 inhabitants/km². The regional capital is Strasbourg, whose urban area is totalling over 440,000 inhabitants. The region is composed of two departments Bas-Rhin and Haut-Rhin. Other main cities are Mulhouse and Colmar.

Franche-Comté has an area of 16,202 km² and a population of about 1.17 million. The region comprises four departments, namely Doubs, Jura, Haute-Saône and Territoire de Belfort. The administrative capital is Besançon (over 134,300 dwellers in the urban area). It is characterised by a 230 kilometres border with Switzerland and shares much of its architecture, cuisine, and culture with its neighbour. Over the 2000-2011 period, Franche-Comté hosted approximately 1.8% of the French population and accounted for 1.8% of national employment in 2010. Other main cities are Belfort and Montbéliard. Rural areas predominate in this administrative region.

Table 2-1 Alsace/Franche-Comté – Key Figures

	France	Alsace	Franche-Comté
Basic Information			
Territory (km ²)	632 834	8 280	16 202
Population (2011 in 1 000)	65 398	1 860	1 177
Population density (inhabitants per km ²)	103.3	124.7	72.7
Economy			
GDP per inhabitant (2009 in €)	29 300	27 500	23 300
Total Employment (2011 in 1 000)	26 328	843	477
Employment Rate (2011 in %)	70.1	72.7	71.8
Unemployment Rate (2011 in %)	9.7	7.7	8.4
Research Infrastructure			
Universities / Academia			
Research Laboratories			
Research* (2009 in % of EAP)	0.82	0.59	0.66
Total R&D Personnel (2009 in % of EAP)	1.37	1.04	1.40
Human Resources in S&T (2009 in 1 000)	14 116	467	200
Human Resources in S&T (2009 in % of EAP)	42.2	45.5	34.0
Intramural R&D Expenditure (2009 million €)	42 685	851	799
(% of GDP)	2.26	1.67	2.93
EPO Patent Applications (2009 by Priority Year)	3 379	113	71

* EAP = Economically Active Population

Source: EUROSTAT

2.2 Automotive Sector

Although the **French automotive industry** is currently struggling in the face of an acute slump in car sales, it still remains a **strategic industrial business sector** and makes **France the second largest automotive manufacturing centre in Europe**.

Alsace and Franche-Comté have a long-standing tradition in the industry including car manufacturing. Today the whole territory is a European hub for the automotive industry, attracting different types of players, **from Original Equipment Manufacturers (OEMs) to international and local suppliers (Tier-1, 2 and 3 suppliers)**. They also make up the **first private R&D centre specialised in ground transportation in France**.

On one hand there is PSA Peugeot-Citroën, one of the leading world-class Original Equipment Manufacturers (OEMs), ranked 2nd in Europe, which has its headquarters in Franche-Comté. A few locally based OEMs offer an **important trade outlet for equipment manufacturers**, thus fostering the development of a rather powerful industry of suppliers. Internationally established companies such as Faurecia, Schrader, Delfingen, Lisi, Timken or Mark IV are based in Alsace and Franche-Comté and deal with operations on both the **domestic and international markets**.

On the other hand, the concentration of head offices in the two regions spawns a **whole set of small industrial suppliers and service companies**, which can be considered as the **backbone of the regional economy**, even if they are less visible. Innovation policies and projects are unevenly spread among those SMEs. This group of small or very small enterprises find themselves in a **paradoxical position** because they are seen as potentially great providers of home-grown jobs thanks to innovation while at the same time remaining financially very fragile and dependent upon unbalanced relationships with large companies. Last but not least, there are **only a few intermediate-sized businesses** in the auto industry; it just reflects a French specificity that is common with other sectors of activity.

The national automotive sector accounts for more than 600,000 direct and indirect jobs in 2011. This should be compared to the 105,000 jobs, in Alsace and Franche-Comté, and in the areas of automotive, ground transportation and mobility services. The main one remains the automotive sector: **about 300 companies and almost 63,000 jobs. More than 1,000 regional enterprises** are involved in the auto industry even if they may also address other business areas.

The regional expertise offers the full range of competencies required to design and produce a vehicle, with a focus on **drive systems and car components**. It is complemented by some other skills that involve non industrial enterprises: telecommunications, smart sensors and systems, mobility services, etc. About forty firms are involved in manufacturing “innovative vehicles” with high innovation potential, and some thirty firms are working on the development of new motorisation systems, with special emphasis on “electric engines”. Another characteristic of the regional automotive industry is the fact that they are involved in national / international programs that combine expertise from a broad spectrum of sectors, from electronics to materials and energy, which demonstrates the importance of **cross-sector partnerships**.

The entire French car manufacturing industry is facing a **serious crisis**, which can be easily explained by **excess production capacity** in regard to domestic and European markets' downturn. These markets are saturated in Western Europe, where most households are equipped with one or two private cars. Furthermore, the regional auto industry is excessively focused on the mid, small and medium-sized cars and it undergoes the fierce competition of international car makers benefiting of far lower labour costs. Consumption has also dramatically fallen on traditional export markets like Spain and Italy. There is at the same time a lack of French-made cars to high-end products.

As a consequence, the automotive sector in Franche-Comté and Alsace is **highly affected by the poor state of the economy: loss of employment** (downsizing) and **closure of businesses** or plants are not the exception today. The two regions have taken up the challenges of productivity improvements and innovation, in order for the industry not only to survive but also to develop by **opening up new markets like electromobility**.

The economic context is obviously the main factor hindering a faster uptake of electric mobility in France as it scares some key public and private players away from further RTDI investments.

3 POLICIES & ACTION PLANS

Many actors are usually involved in the formulation and implementation of RTDI and cluster policies, requiring efficient coordination mechanisms to be well established. Therefore it is essential, to take into consideration the multilevel policy governance role in making RTDI and cluster policy interventions more efficient. As a matter of fact, interdependency of European Union (EU), Member States (MS), regions and players grows alongside the progress of globalisation; it follows that all of the basic factors that facilitate successful R&D and innovation can be affected by efficient and well-directed policies carried out by the EU, its Member States and European regions.

“Multilevel governance (MLG) is used to describe situations in which governance and policy-making is best understood as a process not only dominated by actors centrally located in nation states. The term indicates that policy formation and political authority is significantly influenced or transferred to other levels; either upward to a supranational arena (i.e. EU), downward to local or regional contexts, or sideways to other networks of actors than traditionally in control of policy formation.”

At all governance levels policy makers need to explore novel strategies and approaches to cope with the challenges posed by complex and rapidly changing socio-economic political environments, including globalisation, environmental challenges, changing innovation processes, and so on. The regional dimension is of key importance in innovation policies because interactive learning and innovation processes are often spatially bound, and are strengthened and improved by geographic proximity. With respect to ELMOs, Research, Technological Development and Innovation (RTDI) and Cluster Policies establish conditions to boost investment in research and development, innovation, resource efficiency and the uptake of sustainable green mobility.

Against this background, the subsequent chapters give an overview of electromobility-related RTDI and Cluster Policies as well as of Action Plans implemented in Alsace/Franche-Comté.

3.1 RTDI Policies

Research, Technological Development and Innovation (RTDI) policies are understood as a form of public support of RTDI activities. RTDI programmes/measures provide a structural framework for the funding or other ways of support of a number of projects or initiatives. In most cases this framework is outlined in written programme guidelines or similar documents which are usually binding for the authority responsible for and entrusted with the programme. Generally, these documents set out the goals, rational and responsibilities of the actors involved, define activities supported by RTDI programmes, and so on. They have a limited timespan and are initiated / governed by one or more responsible authorities (e.g. key actors such as agencies, ministries or research councils).

The purpose of the RTDI policy mapping was not to capture all RTDI programmes at national and regional level, but those relating to electromobility and/or one of the three electromobility-constituent sectors Automotive, ICT and (Green) Energy. In the following the major policies are introduced.

In the following an overview of on-going policy programmes/measures of regional and cross-regional relevance introduced by national, regional or local governments is provided. Measures carried out in the past are only listed, if they are of high importance for electromobility and their expiration date was no longer than 2 years ago.

3.1.1 Introduction – A First Impression

With respect to RTDI, two types of innovation policies at the regional scale can be distinguished:

- _ Policies designed and implemented at regional level;
- _ Policies designed at national level and implemented both at regional and national level, which makes the bunch of today's RTDI policies.

France is an example of a **centralised unitary state** where **regional bodies** (like regional councils) **have a sphere of activity rather limited compared to other European countries.**

In practical terms, the high majority of regional RTDI actions, which are linked to electromobility, belong to the second category, to such an extent that the **process** can indeed be described as **essentially "top-down"**. What is at stake with those policies is the **important role of regional actors** to implement the initiatives at the local level. Indeed, **regional bodies have great influence on funding and support provided to the regional innovation system**: the implementation of Competitiveness Clusters or the delivery of research incentives to innovative businesses being two good examples of their concrete actions.

The **CPER State-Region agreements** (CPER stands for *Contrat de Projet Etat Région*) present for each administrative region the main structural actions for the period 2007-2013, including regional innovation policy. The State and the regional council agree on programming and funding major projects such as infrastructure building or key industrial activity support. Three areas, which are common to all regions, are considered in each contract: competitiveness, territorial attractiveness and sustainable development. **RTDI are at the heart of actions and**

projects that structure the economy and employment, stimulate strong economic development and support the changes as well as the emergence of new market-oriented products and services.

European funding can complement national and regional funding: for each administrative region, an Operational Programme 2007-2013 establishes the main guidelines for the use of funding provided by the European Union under the European Regional Development Fund (ERDF). The overall aim of the Operational Programmes is to build on the historic regional assets for the benefit of economic competitiveness and the quality of life of the region's inhabitants. In Alsace and Franche-Comté, Operational Programmes are partly dedicated to **innovation**.

ARI Alsace and **Réseau Innovation Franche-Comté** are respectively the **regional innovation agencies** in Alsace and in Franche-Comté, supported by public subsidies. Regional innovation agencies' activities are mainly oriented towards the **coordination and animation of the regional innovation networks** – those networks take very diverse forms in different regions – as well as the **support to research efforts**, both in the public and private sectors, through:

- _ Direct support to business R&D through national / regional grants or loans or indirect schemes (see also part related to funding instruments);
- _ Support collaborative R&D projects;
- _ Support technology transfer and valorisation of public research results;
- _ Provide direct or indirect support to innovative enterprises, including start-ups.

Depending on the programmes, **RTDI policies are designed both for public research laboratories and private innovative companies**. They act on all different levels **through the whole innovation process**, as detailed below:

- _ Basic technology research / Feasibility study: ANR, Investissements d'Avenir...
- _ Technology / product / service development: ADEME, FUI, Investissements d'Avenir...
- _ Technology demonstration / Pilots: FUI, PREDIT, ADEME...
- _ Significant regional structural initiatives both in Franche-Comté and Alsace

There are **several RTDI programmes directly designed and managed by national entities** like ministries or national agencies, among them (see also detailed measures):

- _ ANR thematic and non-thematic research programmes;
- _ PREDIT research programme;
- _ ADEME research programmes.

In very rare cases, regions can initiate regional calls for projects at their own initiative. These tender procedures are generally not renewed and are more into developing pilots or addressing local issues with **tailor-made solutions**. For example, the Alsace region launched a call for expressions of interest to promote the development of electric mobility services in 2012.

One can note that **there are numerous national RTDI programmes available and a multitude of actors as well as funds available**, which makes the global innovation system **quite difficult to understand**, if not repelling, **for a novice business** willing to develop innovation projects. The proliferation of local actors and agencies, each with their own slightly different political governance, agendas, requirements and practices, is clearly a **major drawback**.

Another issue to mention when talking about RTDI programmes is the **administrative burdens**. Such programmes are most of the time based on calls for proposals both at the regional and national levels. This system has proven to show value for money in regard to public investments but for some reasons the initiative appears less appealing to a certain number of companies. Those **calls for proposals**, as carried out today, **seem to be too time-consuming and too bureaucratic** (let alone its absence of guarantee of success while investing a lot of time). As a consequence, some research laboratories and small innovative companies **become reluctant to setting up collaborative project proposals**; they suspect that the investment will not offer sufficient advantage.

Last but not least, **valorisation of innovation projects** within and outside the two regions is **not always considered as sufficient**.

One **common pitfall of French RTDI programmes**, if not of all public action plans, lies not in their content but in the **lack of evaluation and monitoring processes**. Indeed, in most programmes, there are no publicly available SMART objectives and performance indicators issued at their launch. Thus it is nearly impossible to assess outputs and policy impacts against planned objectives.

3.1.2 Detailed Measures

In the following we give an overview of key aspects of the implemented RTDI policy measures.

ANR Non-Thematic Research Programme 2011-2013		
Duration	Budget (€)	Scope
2011 to 2013		3 – national
Key Policy Actors		
ANR - French National Research Agency (Agence Nationale de la Recherche)		
Sectors addressed		
All innovative technologies and sectors (sub-programmes are generally dedicated to one single theme)		
Key Target Groups		
<input checked="" type="checkbox"/> SME <input checked="" type="checkbox"/> Large Enterprises <input checked="" type="checkbox"/> Research Entities <input checked="" type="checkbox"/> Cluster <input type="checkbox"/> Region <input type="checkbox"/> Other		
Rational		
ANR is the main national research funding organisation. It was established by the French government in 2005 to fund research projects, based on competitive schemes giving researchers the best opportunities to realise their projects and paving the way for groundbreaking new knowledge. The role of ANR is to bring more flexibility to the French research system, foster new dynamics and devise cutting edge-strategies for acquiring new knowledge. By identifying priority areas in basic / fundamental research, ANR also aims at enhancing the general level of competitiveness of both research system and economy.		
Main Outcomes		
Ongoing research programme		
Policy Impact		
No indicators available		

FUI RTDI Projects

Duration	Budget (€)	Scope
2009 to 2011	495000000	3 – national

Key Policy Actors

OSEO Agency on behalf of Ministry of Industry

Sectors addressed

All key technologies and sectors in France represented by Competitiveness Clusters

Key Target Groups

SME Large Enterprises Research Entities Cluster Region Other

Rational

FUI is the acronym of the French Single Inter-Ministry Fund (Fond Unique Interministériel) earmarked exclusively for Competitiveness Clusters (see also Cluster Policies). It aims at co-funding research projects and clusters' collaborative development on the products or services' development which may be put on the market in the short or middle term. The overall goal is to overcome the difficulties to implement the path from the idea to the market – one major weakness of innovation development in France. Two calls for projects are issued every year.

Main Outcomes

Competitiveness Clusters have contributed so far to the emergence of more than 1,000 collaborative research programmes co-funded by FUI instrument. Among the main outcomes are the creation of several patents, new jobs (or saved jobs in a context of stiff world competition), new start-ups and spin-offs, as stated in an interim report of achieved projects, which was released in February 2012.

Policy Impact

The evaluation of the FUI RTDI Projects is directly linked to the evaluation of the Competitiveness Cluster Policy which is actually in progress.

FUI RTDI Innovation Platforms

Duration	Budget (€)	Scope
2009 to 2011	105000000	3 – national

Key Policy Actors

CDC Agency (Caisse des Dépôts et Consignations) on behalf of Ministry of Industry

Sectors addressed

All key technologies and sectors in France represented by Competitiveness Clusters

Key Target Groups

SME Large Enterprises Research Entities Cluster Region Other

Rational

FUI is the acronym of the French Single Inter-Ministry Fund (Fond Unique Interministériel) earmarked exclusively for Competitiveness Clusters (see also Cluster Policies). The FUI RTDI Innovation Platforms initiative intends to create or develop some pooled resources (services and equipment) – known as platforms – in open access to cluster members, in particular SMEs. Such platforms will assist innovation players to complete their innovative projects in the final stages of RTDI : trials, testing and prototype development.

Main Outcomes

The first call for innovation platform projects has just been issued.

Policy Impact

Not available. Furthermore, the evaluation of the FUI RTDI Innovation Platforms is directly linked to the evaluation of the Competitiveness Cluster Policy.

PREDIT 4**Duration**

2008 to 2012

Budget (£)

400000000

Scope

3 – national

Key Policy Actors

PREDIT working groups on behalf of Ministries of Sustainable Development / Industry / Research and ADEME, ANR and OSEO national agencies

Sectors addressed

Transport ICT Energy KET Electromobility Other

Key Target Groups

SME Large Enterprises Research Entities Cluster Region Other

Rational

PREDIT is a programme of research, experimentation and innovation in land transport. By stimulating cooperation between public and private sectors, this programme aims at encouraging the creation of cutting-edge sustainable transportation systems. It has three objectives:

- To ensure the sustained mobility of people and goods
- To increase the safety of transportation systems
- To reduce environmental impacts of transport and address climate change issue

Main Outcomes

Not detailed

Policy ImpactNot detailed

ADEME Research Programme 2007-2010

Duration	Budget (€)	Scope
2007 to ongoing	40000000	3 – national

Key Policy Actors

ADEME - French National Environment and Energy Agency (Agence de l'Environnement et de la Maîtrise de l'Energie)

Sectors addressed

Transport ICT Energy KET Electromobility Other

Key Target Groups

SME Large Enterprises Research Entities Cluster Region Other

Rational

ADEME is the national energy agency placed under the joint authority of the Ministries of Sustainable Development and Research. Within the frame of public policies, ADEME intends to stimulate, animate, coordinate, facilitate and perform operations aiming at the environment protection and energy management. Its areas of intervention are various and include transportation-related topics. One of ADEME's roles is the guidance, organisation and funding of research programmes, along with other activities of consultancy and expert assessments, development of methodological tools, dissemination of best practices, funding of exemplary projects and awareness-raising campaigns.

Main Outcomes

Not available at the present time

Policy Impact

Not available at the present time

« Investments for the Future » Programme

Duration	Budget (€)	Scope
2009 to ongoing	35000000000	3 – national

Key Policy Actors

Government's initiative implemented under the supervision of the respondent Ministries by various national agencies, including ANR (research), ADEME (energy / environment), CDC and OSEO (innovation organisations).

Sectors addressed

Transport ICT Energy KET Electromobility Other

Key Target Groups

SME Large Enterprises Research Entities Cluster Region Other

Rational

The « Investments for the Future » Programme is the French economic recovery plan following 2008 major economic crisis. It follows a national loan issued in 2009 to fund massive investments that could sustain future growth towards a genuine green economy and address the lack of innovation efforts. The programme is a wide range of instruments in favour of innovation : funds to improve national RTDI infrastructure and develop world-class research units, initiatives to build upon public basic research and to accelerate knowledge transfer, several thematic research schemes of highest importance (including automotive, ICT, green energy), new / improved financing tools.

Main Outcomes

The whole programme is ongoing. In the high majority of cases the implementation of above-mentioned instruments has just started.

Policy Impact

Not available

3.2 Cluster Policies

Striving for more evidence-based cluster policy in view of a new generation of improved and excellent clusters, the purpose of this mapping was to collect information on regions' priority areas, policy instruments and measures.

Cluster Policies can broadly be defined as specific governmental efforts aimed to support clusters. These efforts can be categorised in facilitating policies, traditional framework policies and development policies. **Facilitating policies** are directed towards the enhancement of specific conditions that could improve clusters' performance. **Traditional framework policies**, such as SME policies, research and innovation policies, and regional policy often use the cluster approach to increase the efficiency of a specific instrument. And **development policies** strive for creating, mobilising or strengthening business strategies and cooperation between organisations and people through knowledge sharing at regional or cluster level.

3.2.1 Introduction – A First Impression

This part of the document doesn't analyse indirect cluster policies such as SME, research or economic development as they are too many of them and they just use clusters as interfaces to reach targeted businesses. The following cluster policies are only direct policies whose goal is to foster the set-up of clusters.

There are basically two types of clusters in France:

- _ Competitiveness Clusters;
- _ Regional / Local Clusters.

Competitiveness Clusters (*Pôles de Compétitivité*) are vibrant thematic **world-class clusters set up at the national level**. It refers since 2005 to a **label granted by the French State** (Ministry of Industry). There are today **71 clusters of this kind** working in future-oriented sustainable fields of activity: aeronautics, agri-food, renewable energy, ICT, health, building... Among them, there are 3 major automotive clusters in France, **Pôle Véhicule du Futur** being one of them. **Competitiveness Clusters generally comprise of private companies, public research entities, economic development organisations and local authorities.**

Each Competitiveness Cluster adopts a **5-year strategic plan** inspired by the "Triple Helix" approach in order to set up **collaborative RTDI projects** and promote an overall environment that fosters both **innovation** and **growth** among cluster members. **Priority is given to SMEs** in term of funding opportunities and innovation support. Local authorities are the main supporters of those Competitiveness Clusters, which are also funded by the State and of course by businesses located in Alsace and Franche-Comté. For example Pôle Véhicule du Futur succeeds in having **a proper balance between the financial inputs from the public and private sectors.**

2013 will see the next generation of Competitiveness Clusters. New objectives and funding scheme remain unknown at the present, however it is expected that the **number of clusters will be largely reduced** and those

remaining clusters will be **more focused on market-driven projects which create home-grown jobs** – clusters' most important activity, and on assistance to cluster members throughout the whole process of turning innovative ideas into tangible products and services on the market. Funding is also a thorn in the side because the majority of **Competitiveness Clusters are faced with the double challenge of winning new member companies and providing new for-profit services** to offset the voluntary reduction in public funds allocated to regional policies.

On the other side, there are in France other types of local clusters:

- _ Regional Clusters;
- _ Rural Excellence Clusters;
- _ Local independent or informal clusters.

The Regional Clusters 2011-2013 policy aims at developing various clusters which bring together large and small companies (mainly SMEs), research laboratories and educational centres, all working together in a specific region to **develop synergies and cooperative efforts**. Generally speaking, **Regional Clusters** (*Grappes d'entreprises*) are **less RTDI intensive but more focused on networking and partnerships**. They are expected to work hand in hand with Competitiveness Clusters and achieve a comprehensive network of clusters throughout France.

Rural Excellence Clusters (*Pôles d'Excellence Rurale*) are officially labelled by the French State and deal with entrepreneurship / innovation best practices in favour of the revitalisation of the countryside.

Local, independent or informal clusters (without any "official" labels) do exist but are rather rare.

In Alsace and Franche-Comté, the list of existing clusters is as follows:

- _ **8 Competitiveness Clusters:**
 - o Alsace BioValley (biotechnology / health);
 - o Alsace Energivie (eco-technology / energy / building);
 - o Fibres (fibres / new bio-materials);
 - o Hydreos (eco-technology / water);
 - o **Véhicule du Futur (automotive / transport / mobility services);**
 - o Microtechniques (microtechnology);
 - o Plastipolis (plastics technology);
 - o Vitagora (farming / agri-food);
- _ **5 Regional Clusters:**
 - o ARIA-Alsace (agri-food);
 - o Pôle Textile Alsace (textile);
 - o Rhenatic (ICT);
 - o Franche-Comté Interactive (ICT);
 - o Cluster Eco-Chantiers (eco-technology / building).

3.2.2 Programmes in Detail

In the following we give an overview of key aspects of the implemented cluster policy programmes.

NB: OUTCOMES AND POLICY IMPACT BELOW DESCRIBES OBJECTIVES, NOT ACHIEVED RESULTS

Competitiveness Clusters 2009-2012		
Duration	Budget (€)	Scope
2009 to 2012	1500000000	3 – national
Key Policy Actors		
French State / Ministry of Industry		
Key Implementing Actors		
French State / Ministry of Industry and national agencies (research, energy, innovation)		
Sources of Funding		
<input checked="" type="checkbox"/> National Ministries <input type="checkbox"/> Regional Government <input type="checkbox"/> Structural Funds <input type="checkbox"/> Region <input type="checkbox"/> Enterprises <input checked="" type="checkbox"/> Other		
Sectors addressed		
All key thematic sectors and technologies for current and future high potential markets		
Key Target Groups		
<input checked="" type="checkbox"/> Business Entities <input checked="" type="checkbox"/> Research Entities <input checked="" type="checkbox"/> Public Authorities <input type="checkbox"/> Citizens <input type="checkbox"/> Other		
Rationale		
<p>The Competitiveness Clusters 2009-2012 policy aims at developing vibrant world-class clusters at the national level. A Competitiveness Cluster brings together large and small firms, research laboratories and educational establishments, all working together in a specific region to develop synergies and cooperative efforts. Competitiveness Clusters are currently active in most activity sectors, from emerging technologies to more mature sectors such as automotive. Their goal is to build on synergies and innovative, collaborative projects in order to give partner firms the chance to become first in their fields of activity. In France 71 clusters have been labelled as Competitiveness Clusters following a national call for tenders.</p>		
Main Outcomes		
<p>The evaluation of the Competitiveness Clusters 2009-2012 policy is ongoing. Expected outcomes are :</p> <ul style="list-style-type: none"> - Large basic / applied research efforts in a full range of key technologies for current and future high potential markets - Increased stability of regional industrial ecosystems thanks to animation work and coordination - 14 calls for collaborative innovation projects exclusively dedicated to Competitiveness Clusters members (see FUI in RTDI policies) - Cross-cluster cooperation initiated and international activities of cluster members promoted - Direct economic impacts : innovative products / services, patents and job creation (including new SMEs) - Test of new models of governance for cluster management and new financing instruments for innovative enterprises 		
Policy Impact		
<p>More than 30 performance indicators are set up at two different levels :</p> <ol style="list-style-type: none"> 1) Goals achieved for each Competitiveness Cluster, e.g. number of working groups, innovative projects, jobs created, patents, SMEs involved in projects, international cooperation agreements ; part of private funding in cluster management 2) National policy evaluation : "Value for money" core principle underpinning the use of public funds, e.g. to support actors of economic growth, to initiate RTDI projects, to fill in the gaps in the innovation chain, to co-finance innovative firms and/or products or services 		

NB: OUTCOMES AND POLICY IMPACT BELOW DESCRIBES OBJECTIVES, NOT ACHIEVED RESULTS

Regional Clusters

Duration	Budget (€)	Scope
2011 to 2013	25000000	3 – national

Key Policy Actors

French State / Ministry of Regional Planning

Key Implementing Actors

French State / Ministry of Regional Planning and national agencies (innovation)

Sources of Funding

National Ministries Regional Government Structural Funds Region Enterprises Other

Sectors addressed

Transport ICT Energy KET Electromobility Other

Key Target Groups

Business Entities Research Entities Public Authorities Citizens Other

Rationale

The Regional Clusters 2011-2013 policy aims at developing a national network of clusters which bring together large and small companies (mainly SMEs), research laboratories and educational centres, all working together in a specific region to develop synergies and cooperative efforts. This initiative is complementary to the Competitiveness Clusters policy as Regional Clusters – effectively smaller clusters – are less "RTDI-intensive" and more into collaborative projects at the end of the innovation chain, to improve employment market and to meet business needs. In France 126 clusters have been labelled as Regional Clusters following a national call for tenders.

Main Outcomes

Expected main outcomes are the following :

- Territory-wide spread of the concept of cluster
- Increased stability of local and regional thematic networks of companies thanks to animation work and coordination
- Cross-cluster cooperation initiated and international activities of cluster members promoted
- Direct economic impacts : innovative products / services, patents and job creation (including new SMEs)

Policy Impact

Policy impact indicators have not been precisely defined yet. Among the main objectives can be listed the following :

- Quality of interactions with other economic development actors (incl. Competitiveness Clusters)
- Services provided to cluster members (relevance, cost-effectiveness, user satisfaction)
- Cluster's strategic marketing roadmap and governance
- Contribution to vibrant local economy (collaborative projects, jobs created, added value to former situation)

3.3 Electromobility-related Action Plans

“*Electrification of mobility means embedding electric vehicles in a wider intermodal green transport system taking into account new usage patterns such as car sharing, leasing or transport on demand models, public means of transport as well as intelligent last mile freight.*”

In general, regional/national **Electromobility Action Plans** comprise a vision and strategy for electrification of mobility or in a wider sense sustainable green mobility, define thematic priorities, objectives, actions and measures while outlining the potential of electric/future mobility, challenges ahead and regional/national strengths.

By mapping regional/national electromobility-related Action Plans, ELMOs strives to gather information on the knowledge, competencies and experiences available in the region to compare strategies, activities and measures defined and goals achieved to identify good practices, areas of mutual learning, complementarities between the participating regions and areas for future activities to be defined in the Joint Action Plan.

3.3.1 Introduction – A First Impression

The 2009 **EV and HEV Development National Plan** (*Plan national pour le développement des véhicules électriques et hybrides rechargeables*) is the government's action plan to address both fast-changing business model and societal demands for the automotive sector, in the global context of energy crisis, reliance on imported oil, increase of greenhouse gas emissions and economic crisis. The development of Electric Vehicles (EV) and Hybrid Electric Vehicles (HEV) is seen as a great opportunity to tackle **climate change** issue and to help **restructuring the whole industrial sector**.

A treatment of at least three important aspects in France seems warranted.

The **energy market in France is highly concentrated** and is dominated by two incumbent suppliers, which were the two former government corporations for electricity and gas: EDF and GDF Suez. **EDF (94% of the national electricity market in 2011) is deeply involved in the promotion of electric mobility**. Competition from alternative suppliers has been shyly increasing in recent years. Most electricity customers are subject to **regulated tariffs**, which are below the EU averages. This makes the cost for EV charging even more attractive.

The **nuclear power** as the primary source of electric power in France is seen by people and officials as a **major asset to promote electromobility** (climate change issue). From a technical view, **the national power grid can support the take-up of several thousands of electric vehicles with minor impacts on GHG emissions** (excluding EV battery making and recycling). Unfortunately **the use of nuclear energy involves certain risks**

that include radiation risks, long-term radioactive waste storage issue, nuclear spills like Fukushima-Daiichi in 2011, not mentioning the total cost of decommissioning nuclear power plants. Since nuclear energy plays a substantial role in France over the last decades, officials have a **lower propensity to considering other means of greener electricity production**.

The automotive industry is an **important and traditional sector** in France, in term of employment, research and political sponsors. The two main national carmakers (PSA Peugeot and Renault) are seen as **forerunners in the electric car market**. Both of them propose various hybrid and electric car models since the last few years.

The EV and HEV Development National Plan was set up in 2009 to support the national automotive industry, by fostering innovation for green growth that creates jobs and achieves sustainability. The plan's **14 actions** may be summarised as follows – most of these actions are **still on-going today**:

- _ Support new EV / HEV designed and manufactured by national automotive industry ;
- _ Develop charging infrastructure to boost demand for electric vehicles;
- _ Support real-life electric car pilots in regions;
- _ Create consumer incentives for the general public (up to 5,000€ for purchasing an BEV);
- _ Enhance electromobility-related basic and applied research;
- _ Improve national legislation when necessary.

When the document was issued in 2009 it was officially expected that low-emission vehicles will stand for 27% of new car sales in France by 2025 (4 million cars). However in regard to today's national electric car sales **the take-up of electric mobility will be realistically slower than planned**. The original goal was unreasonably too ambitious.

A new action plan will probably be released in the course of 2012 to complement or reinforce tasks defined in the current programme. The EV and HEV Development National Plan, which occurred to a large extent on politicians' initiative, can also be criticised for failing to respond to the basic requirements of programme performance evaluation, as no budget was clearly dedicated to the action plan and no timeframe and monitoring indicators were set up.

Following this Action Plan, the **official guidance for the implementation of charging infrastructure** was translated in the "Green Paper on low-emission vehicle charging infrastructure open to the public", which was issued in April 2011. **14 pilot local authorities** committed themselves in 2010 to promote electric mobility through the signature of a charter. Indeed, it is expected that the **public sector will have a leadership position** to initiate the national network of EV charging stations, when privately investing in profitable conditions remains uncertain. By leading by example, and by opening up a brand new market, the French State along with the local authorities aims at setting in the **« snowball effect »** required to foster the development of electric mobility.

Two other Actions Plans are indirectly related to electromobility but have not been detailed in the present document:

- _ National Renewable Energy Action Plan (*Plan d'action national en faveur des énergies renouvelables*);
- _ National Action Plan for Digital Economy (*France Numérique 2012*).

3.3.2 Detailed Actions

In the following we give an overview of key aspects of the implemented electromobility-related action plans. For full details of each action plan, including activity areas and related measures, please see Appendix 1.

EV and HEV Development National Plan		
Period of Plan	Budget (€)	Scope
2009 to ongoing		3 – national
Key Actors		
Action Plan funded and managed by the French State / Ministry of Transport with the assistance of national agencies, local authorities and major private companies in the automotive sector.		
Key Target Groups		
<input checked="" type="checkbox"/> Business Entities	<input checked="" type="checkbox"/> Research Entities	<input checked="" type="checkbox"/> Public Authorities
<input checked="" type="checkbox"/> Citizens	<input checked="" type="checkbox"/> Other	
Vision		
The EV and HEV Development National Plan is the government's plan to address both fast-changing business model and societal demands for the automotive sector, in the global context of energy crisis, reliance on imported oil, GHG emissions and economic crisis. The development of EV and HEV is seen as a great opportunity to tackle climate change issue and to help restructuring the whole sector, fostering innovation for green growth that creates jobs and achieves sustainability.		
Strategy		
Reinforce RTDI instruments to create the sustainable mobility of tomorrow based on electromobility		
Foster the emergence of a national competitive electromobility sector Develop EV charging infrastructure at home, at work and in public spaces		
Anticipate future environmental requirements (GEG emissions mainly)		
Thematic Priorities		
New EV and HEV designed and manufactured by national automotive industry		
Develop in priority charging infrastructure to boost demand for electric vehicles		
Allow real-life electric car pilots (both regional and transnational pilots)		
Create consumer incentives for the general public		
Enhance applied research		
Improve national legislation if necessary		
Objectives		
Creation of a new economic activity worth 15 B€ by 2030 relating to low-carbon vehicles (industry, infrastructure and services)		
Maintaining qualified jobs in the sector		
Reduction of 4 Mtoe of oil imports		
Reduction of 17.5 Mt of CO2 emissions by 2020		
Identified Potential for Future Mobility		
It is officially expected that low-emission vehicles will stand for 27% of new car sales in France by 2025 (4 million cars) Societal demands for sustainable mobility whereas strong psychological attachment to the car at the same time		
- Nuclear power as the primary source of electric power in France is seen by people as a positive argument for electromobility (climate change issue)		

Identified Strengths

Automotive industry is an important and traditional sector in France, in term of employment, research and political sponsors

Global will to develop electromobility

Relevant instruments to enhance electromobility-related innovation projects

Niche markets are emerging (especially utility vehicles)

Launch of new-generation cars with acceptable driving range since 2011 by main car makers : Citroën C-Zéro, Peugeot Ion, Mitsubishi I-Miev, Renault Fluence, Mia-Electric, Bolloré Blue Car, Nissan Leaf, VW E-up, Opel Ampera, Toyota Prius...

Impact

Potential for Sustainability

3.4 The Interplay of RTDI, Cluster Policies and Action Plans – A Summary

France has a long-standing tradition of centralisation, putting forward a **top-down approach in RTDI policy making and implementation**. If all policies are mainly decided at the national level by the State, or through its various agencies, **the regional players remain of high importance for delivering policies and achieve expected results, not only as co-financing providers**. Europe is today another actor as it interacts with the traditional relationships between the State and the regions, especially regarding EU Regional Policy.

The **main national Action Plan in favour of the promotion of electromobility is considered as comprehensive** because it includes all aspects of electric mobility development, from technology push (R&D) to market pull (consumer incentives). However it can be reproached for demonstrating a lack of realism and rigour in giving full effect to the commitments.

Research is well funded in France, with significant budgets available in different research programmes. Furthermore, the **RTDI policies are designed for all the innovation process stages**, that is to say from basic research, feasibility study, technology development, pilots to service / product development and pre-commercialisation. It is largely acknowledged that the last steps towards commercialisation, where the economic benefits reward the efforts and resources invested, are the most difficult ones and represent the most important margin for progress in Alsace and Franche-Comté to create a more efficient “innovation system”.

Especially, **Competitiveness Clusters have been created to achieve better links between higher education, public research and the entrepreneurial world**. If there are still difficulties if making those culturally different partners work together, things are improving in a positive way.

The interaction of the complementary policies and action plans, which were outlined in the previous sections, is globally seen as good for at least two reasons:

- The variety of research programmes, policies, funding schemes in all business areas linked to electromobility offers companies a rather **comprehensive toolbox on the path to further investments in research and innovation**;
- Regional clusters, especially thematic **Competitiveness Clusters, play the role of interfaces** between private companies, public research bodies, education centres and the State in order to implement top-down national policies and action plans.

Major weaknesses have also been identified in France and the two regions:

- The **complexity of the “innovation system”** as a whole, by multiplying RTDI programmes and players at all levels, leads to innovation-friendly initiatives operated with less efficiency and maybe at greater expense;

- **“Red tape”**: the bureaucratic process of setting up innovative projects **scares some SMEs and research laboratories out of innovation**; it is essentially impairing small / medium-sized innovative businesses as large enterprises can rely upon their strong financial position to support in-house private research activities, even in the course of a long period of time;
- Unfortunately regions are in the position where they are only able to take the initiative on **actions / policies of less substance and consequence**.

The table below summarises the interplay of RTDI, Cluster Policies and Action Plans in Alsace and Franche-Comté in relation to the overall goal of ELMOs to promote more sustainable transport, through the development of electromobility solutions for cities and regions.

Figure 3-1 Assessment of RTDI, Cluster Policies and Action Plans

<i>Which aspects would you want to keep or improve?</i>	<i>Which aspects would you like to develop or strengthen?</i>
<p>Retain</p> <p>Aspect 1: Variety of RTDI research programmes available through the whole innovation process</p> <p>Aspect 2: Better links between public research and innovative businesses</p> <p>Aspect 3: Comprehensive action plan to develop electromobility</p>	<p>Enable</p> <p>Aspect 1: Capacity to assist businesses in bringing innovative products / services to the market in order to get economic benefits and create jobs</p> <p>Aspect 2: Clear strategic vision and commitments to promote electromobility at the national level</p> <p>Aspect 3</p>
<i>Which aspects would you want to abandon or replace?</i>	<i>Which aspects would you like to circumvent/stay clear off?</i>
<p>Eliminate</p> <p>Aspect 1: Complexity of the “innovation system” as a whole (players, programmes)</p> <p>Aspect 2: “Red tape”</p> <p>Aspect 3</p>	<p>Avoid</p> <p>Aspect 1: RTDI policies that don’t respect the “good value for money” principle in regard to public funding</p> <p>Aspect 2: RTDI policies unrealistic in regard to businesses’ needs and way of working</p> <p>Aspect 3</p>

4 ELECTROMOBILITY-RELATED RTDI INFRASTRUCTURES

*“**Research infrastructures** refer to facilities, resources and related services that are used by the scientific community to conduct research in their respective field. This definition covers research entities, investors and financial instruments as well as R&D projects carried out by multiple stakeholder.”*

Research infrastructures play an increasing role in the advancement of knowledge and technology and their exploitation. Accordingly, an innovative regional infrastructure serves the needs of enterprises that aim to bring their innovations to market and to drive enterprises competitiveness and regions' welfare. Against this background, mapping the electromobility-related RTDI supply in the region not only provides an overview of the current state of play, but also allows for a matching of the supply and the demand side within the region and between regions.

4.1 Basic Information

Alsace and Franche-Comté have a very good automotive RTDI infrastructure, which is mainly **focused on drive systems and low-carbon vehicle technologies** (e.g. fuel cell), also on **smart mobility and mobility services** (ICT); on the other side it is less focused on green energy technology.

National and regional RTD expenditure are both **below the ideal 3% share of GDP threshold**. Whereas Alsace remains at 1.6%, Franche-Comté does stand out because of its high rate of 2.1%, ranking third among French administrative regions. The weight of the public sector in terms of investments and researchers is also different: if Alsace figures are quite similar to French statistics (47% vs. 43%), the share in public sector accounts for 14% only in **Franche-Comté**, making it the **first region for private research activities**.

In Alsace, the relatively low level of RTDI investments is mainly due to the weakness of business expenditures. Research and innovation activities are oriented towards regional key industries, namely the agro-food, automotive (mechanical and electrical engineering), chemistry and textile industries.

In Franche-Comté, all statistics reflect the very strong presence of private RTD in the region, which is mainly carried out by large companies with over 1,000 staff members (accounting for 86% of private R&D expenditure) and concentrated on a very few sectors: automobile, energy and plastics industry.

Generally speaking, there is a large **political will to support electromobility-related research** and innovation activities in both regions, just mentioning Strasbourg, one of the leading cities in France in this area.

Major RTDI strengths in Alsace / Franche-Comté

In the current state of crisis, main large companies manage to **keep investments in RTDI at a relatively high rate**. Regional public and private research focuses on industry, for some historical reasons. The automotive sector is the main industrial target but other activities remain important in Alsace (agro-business, building, health) and in Franche-Comté (micro technology, agro-food, forestry, plastics).

The weight of the private sector's research and development efforts is another asset of the two administrative regions.

Furthermore, **human resources** (both higher education and training) are seen as **good** and are today available to support the needs for more innovation in the business area of electric mobility. In the two regions 122 educational trainings in relation to the business area of transport (auto industry, transport, management, etc.) have been identified at all levels of education, reflecting their propensity to address new technological challenges.

Major RTDI obstacles in Alsace / Franche-Comté

Several major RTDI obstacles have been identified while carrying out this regional analysis.

Regional actors have high **difficulties to bring an innovative product / service to market** and translate innovation / creativity into additional employment. This is rather critical because lots of projects end up without significant outputs. It is believed that Competitiveness Clusters will have to play a key role in improving this situation in the future.

Furthermore, **public research entities don't work closely with enterprises**. Many University representatives have the negative feeling that they are forced to work with the private sector in a context of on-going reduction of public funding. While this change is challenging the way most public researchers are used to work, there is little enthusiasm in exploring new public-private opportunities. The situation is in progress but can still be improved by spreading the entrepreneurship state of mind in the public research area. However, such situations vary greatly in type and origin from research entity to research entity.

Public research laboratories are also sometimes the victims of bureaucracy, which can greatly delay decision-making for specific initiatives. The situation can be even worse if several labs are involved in the same research project.

Technology transfer organisations, which come mainly from the public sector, are in most cases **not linked to SMEs' needs** and commonly work more with major companies within the traditional frame of the patent system. They often lack a marketing-oriented vision, i.e. how to link research outputs to potential markets. The work is complicated by the fact that public research entities operate more and more often in a competitive environment, induced by the decrease of public funding and more liberal RTDI policies.

Another RTDI obstacle is the big difficulty to **push some (declining) traditional enterprises into the path of innovation**. In a similar way, the three different sectors addressed by ELMOs (Automotive / ICT / Green energy) don't really work hand in hand. When it happens it involves large companies more often than SMEs.

Last but not least, **electric vehicle sales are far below expectations** despite large communication campaigns that are carried out by the French State, local governments and private players. The current context makes it more difficult to advocate RTD programmes in favour of electromobility, especially for private research centres.

Main expectations regarding RTDI in Alsace / Franche-Comté

There are **five main expectations** regarding the improvement of regional RTDI in Alsace / Franche-Comté, as follows:

- Develop local capacities to support from-idea-to-market collaborative innovation projects and to the creation of new jobs;
- Increase both public and private investments in RTDI to improve international competitiveness in the context of globalization (towards the ideal threshold of 3% share of GDP);
- Establish a strong regional electric vehicle ecosystem, by mixing various players – public bodies, businesses, end-user groups;
- Help micro-entreprises with very high innovation potential to grow, achieve and maintain a steady source of revenues;
- Bridge the gap between private and public research.

4.2 Research Entities

In general, and in particular in the case of RDCs, research entities are of high importance for innovation at entrepreneurial and regional level. These comprise «Universities» including Universities of Applied Sciences, «Public Research Entities» partly or fully publicly financed and «Private Research Entities» fully privately financed. While all three types of research entities, to a greater or less extent, are involved in basic as well as applied

research, Universities are also engaged in higher-education training and education contributing to the future availability of highly skilled human resources in the region.

In Alsace and in Franche-Comté, **31 research units are directly or indirectly involved in electro-mobility**, making the regional RTDI Infrastructure quite important: **17 University / Public Research Entities** and **14 Private Research Entities**.

In addition to research laboratories, there is a **large network of public interface organisations** that are dealing with **valorisation, technology transfer and public-private R&D partnerships** providing different types of services to businesses conducting innovation projects, with a focus on SMEs. **Each region has a different network** of research and innovation players.

The public sector is represented as follows (more details in Appendix A1 - List of Electromobility-related Research Entities):

- **Universities:** Université de Strasbourg, Université de Franche-Comté, Université de Technologie de Belfort Montbéliard ;
- **High Schools of Engineers** – basic research or applied research: INSA de Strasbourg, ENSISA - Ecole Nationale Supérieure d'Ingénieurs Sud Alsace, Ecole de Management de Strasbourg ;
- **Other Public Research Entities:** Institut FC LAB, Institut FEMTO-ST, IESS - Institut d'Electronique du Solide et des Systèmes.

The scope of research topics is broad enough to **address almost all issues regarding the development of innovative, marketable electric vehicles and electromobility-related services**. Public research themes in Alsace and Franche-Comté include **mechanics and control, microtechnology, electronics, smart systems, computer sciences, IT systems, geomatics, telecommunications, urban planning and business management**. One major area is underrepresented, if not missing: it is research on green energy technology and smart grids.

One must bear in mind that **public research entities tend to work more and more in a global network**, both at the national scale and at the European level; this makes sometimes the regional frame less relevant. Some of the above-mentioned laboratories are **world-class research units** which have gained a reputation that extends beyond borders, such as FC LAB (fuel cell systems) and FEMTO-ST (microtechnology for applied mechanics, among other topics). It is one of the regional priorities to help those several world-class research units keeping the leadership in their specific innovation area.

The list of the **14 electromobility-related private research entities** is the following:

- **Automotive sector:** A Raymond (fastener systems), Clemessy (electric system engineering and installation), Cooltech (magnetocaloric technology), Delphi (car components), Faurecia (exhaust systems), MaHyTec (hydrogen vehicles), MMT (contactless solutions for motion control and drive systems), Mäder (industrial paint and varnish), Convertteam – Alstom (power conversion engineering), General Motors (OEM), PSA Peugeot (OEM);

- **ICT**: Parkeon (car park management services), Orange Lab (telecommunications and travel), Photline (optical modulation solutions).

Private research units are spreading among large companies, but **small organisations can also trigger high-level innovation activities**. For example, this is the case of MaHyTec, which is a spin-off company of Franche-Comté University. The **traditional patent system** is the foundation for private research laboratories.

The assessment of the current situation in Alsace / Franche-Comté relative to electromobility-related research entities is summarised in the table below.

Figure 4-1 Electromobility-related Research Entities – Assessment of Structure, Intersections & Interplay

<i>Which aspects would you want to keep or improve?</i>		<i>Which aspects would you like to develop or strengthen?</i>	
Retain		Enable	
Aspect 1: Actions to support world-class research units thoroughly keeping the leadership		Aspect 1: Public research laboratories' closer collaboration with private businesses	
Aspect 2		Aspect 2	
Aspect 3		Aspect 3	
<i>Which aspects would you want to abandon or replace?</i>		<i>Which aspects would you like to circumvent/stay clear off?</i>	
Eliminate		Avoid	
Aspect 1: Bureaucratic burdens which prevent further research activities within companies		Aspect 1	
Aspect 2		Aspect 2	
Aspect 3		Aspect 3	

4.3 Financial Actors & Instruments

The allocation of financial resources to RTDI can play an important role in driving innovation in electromobility. It is therefore essential, to get a detailed overview of financial actors investing in innovation activities in the area of electromobility and such focusing on one of the electromobility-constituent sectors Automotive, ICT, (Green) Energy. Collecting information on financial actors, instruments, volumes, investment size, scope and beneficiaries allows for a better alignment of public and private investment in RTDI within the region and across regions as well as an improved utilisation of EU structural funds.

Table 4-1 Financial Instruments available in the Region

Financial Instrument	Short Description	Availability			
		R	CR	N	EU
Seed Funds	Seed capital is the initial capital used to start a business. Seed capital usually comes from the founder's personal assets or investments by friends and family, but can also come from outside angel investors. Since the venture is usually in the conceptual stage, seed capital is used to sponsor research and development and cover basic expenses until the product or services can begin generating revenue.				
Business Angle Funds	An Angle Investor, also referred to as «Informal Investor» is a high net worth individual who invests in a business venture, providing capital for start-up or expansion, either in exchange for convertible debt or equity. They are thought of as bridges between loans from family and venture capital.				
Crowd Funding	Crowd funding refer to the funding of a company by selling small amounts of equity to many investors and therewith describes an collective effort of pooling financial resources; it addresses the equity gap between loans from family/friends and informal investors.				
Bank Loans	A debt-financing obligation issued by a bank or similar financial institution to a company or individual.				
Mezzanine Capital	A hybrid of debt and equity financing that is typically used to finance the expansion of existing companies. Mezzanine financing is basically debt capital that gives the lender the rights to convert to an ownership or equity interest in the company if the loan is not paid back in time and in full. It is generally subordinated to debt provided by senior lenders such as banks and venture capital companies.				
Venture Capital	Investment funds allocated to speculative activity. Risk capital refers to funds used for high-risk/high-reward investments. These funds are made available for start-ups and small businesses with exceptional growth potential.				
Guarantees	A promise made by a third party (e.g. bank, region) to provide payment on a bond, loan, or other liability in the event of default.				

There is a **high complexity of actors and public or private funds available at the national and regional levels in France** (where one counts no less than 6,000 types of enterprise aids across the country!). As it is pretty difficult to offer a thorough review of all existing financial actors and schemes, the next paragraphs will introduce the most important and relevant aspects of the financial part of the innovation ecosystem, with a focus on SMEs. One must not forget that **in many French private companies the most important part of innovation-related investments remains supported by in-house resources.**

At first sight, **all types of financial instruments are available in the two administrative regions:** traditional bank loans (debt-financing obligations), bank guarantees, mezzanine capitals, venture / risk capitals, seed funds and business angels.

In the private sphere, **banks and private investors like business angels** are key players. **Venture / risk capitals** are by default the **most suitable schemes** but in reality they could be more often used for innovation purposes. Business angels tend to be more and more active in the support of young SMEs, although their relative importance remains small. Crowdsourcing is very new and has very little impact to date. For historical reasons maybe, it seems to be more popular in certain business areas such as computer sciences or leisure (e.g. music production) but it hasn't really embraced the industry world.

Public support of innovation came into renewed focus in the recent years. Apart from RTDI programmes and other direct aids, innovation is also funded by **indirect subsidies like public social and economic incentives**. The public sector in France is an active player in supporting the development of businesses. **OSEO** is the public body which plays the most important role; it is known as the "**public bank for innovation**".

Since 2005, OSEO acts as the national innovation agency and as a public bank. Its aims at **supporting technology transfer and innovative technology-based projects** with real marketing prospects **and providing assistance and financial support to SMEs** in the most decisive phases of their life cycle: start up, innovation, development and business transfer / buy out. **By sharing the risk, it facilitates the access of SMEs to financing by banking partners and equity capital investors**. Two schemes are popular in Alsace and Franche-Comté: "**innovation cheque**" (*chèque innovation*) and **research tax credit** (*crédit d'impôt recherche*). The first financial instrument is a direct grant to support innovation in all its forms (patent, access to laboratories, feasibility study, marketing study, etc.) and the second one offers tax discounts as far as companies carry out RTDI activities.

There are **57 funding schemes identified in Alsace and Franche-Comté** (more details in Appendix A2 - List of Financial Actors & Instruments), among them:

- _ 25 of them are nation-wide funding schemes;
- _ 15 are regional instruments available in Franche-Comté (but not always restricted to this region);
- _ 17 are regional instruments available in Alsace (but not always restricted to this region).

Nearly all schemes that have been identified are not related to one specific business area. As a consequence, they are suitable for cross-sectorial project and companies, which is in line with ELMOs project's objectives.

Many financial instruments in favour of innovation are designed for SMEs, which is seen as a positive asset. Globally speaking, the public innovation funding schemes are **less attractive to intermediate-sized companies**, which find themselves in the tricky situation of being too big for benefiting from them, at the same time too small to carry out their own private, long-term RTDI policy. This has to be related to the unbalanced typology of French businesses.

A few instruments target researchers who are ready to start up in business and possibly create their own company.

Regions have a great role to play. They can lead the initiative of **creating local public-private risk capital organisations**, in order to leverage the private efforts. Regional innovation projects can be **co-funded by local authorities** in the name of local economic development, along with **ERDF funds**. However, most of the public financial instruments are designed and / or organised at the national level.

The **rationalisation of the whole innovation ecosystem**, especially in regard to financial instruments, is a recurring theme in political discussions, but it has **longstanding difficulty in becoming a reality**. It would contribute to **greater efficiency in public resource allocation**. Innovation **“one-stop-shops”** could for example be more attractive to young entrepreneurs and SMEs.

The assessment of RTDI financial actors and instruments in Alsace and Franche-Comté is presented in the table below.

Figure 4-2 Assessment of RTDI Financial Actors & Instruments

<i>Which aspects would you want to keep or improve?</i>	<i>Which aspects would you like to develop or strengthen?</i>
<p>Retain</p> <p>Aspect 1: Strong support to SMEs</p> <p>Aspect 2: Variety of financial instruments available</p> <p>Aspect 3: Non-specific schemes (not bound to one unique business area)</p>	<p>Enable</p> <p>Aspect 1: Rationalisation of the whole innovation ecosystem</p> <p>Aspect 2:</p> <p>Aspect 3</p>
<i>Which aspects would you want to abandon or replace?</i>	<i>Which aspects would you like to circumvent/stay clear off?</i>
<p>Eliminate</p> <p>Aspect 1: High complexity of public and private financial instruments available</p> <p>Aspect 2: Lack of instruments specifically designed for medium-sized businesses (funding less interesting as long as SMEs grow up)</p> <p>Aspect 3</p>	<p>Avoid</p> <p>Aspect 1:</p> <p>Aspect 2</p> <p>Aspect 3</p>

4.4 Electromobility-related R&D Projects

“**Basic research** (aka fundamental or pure) research is driven by a scientist's curiosity or interest in a scientific question. The main motivation is to expand man's knowledge, not to create or invent something. Unlike basic research, **applied research** aims to address and answer the practical problems that exist in the modern world, rather than to just acquire knowledge for knowledge's sake. Importantly, applied research is, like basic research, based on previous theory.”

One of Pôle Véhicule du Futur's objectives is to initiate and approve innovation collaborative project proposals led by cluster members. **119 collaborative projects were approved between 2009 and 2011**, that is to say they were **“labelled”** as an official cluster project **following a high-level expertise process**. Such expertise, based on the participation of high-level experts, guarantees the level of innovation, to outline the potential markets to address, and to assess the project's impacts on home-grown job creation.

The label does not necessarily imply being successful regarding tenders (some labelled projects are pending when tenders are still under consideration or were unsuccessful). Since the creation of Pôle Véhicule du Futur, until now, **97 innovation collaborative projects were funded**, which amount to a total of **263 M€**.

Among them, **62 projects (52%)** that could be directly or indirectly **linked to ELMOs project's topics** were identified. **28%** of all labelled projects only can be defined as **cross-sectorial projects, essentially linking ICT to transport and mobility**. Pôle Véhicule du Futur has not a very long history of initiating European projects on behalf of its cluster members. Thus, **only 17 European projects** have been granted so far, and there is a general desire to **develop more R&D projects under European programmes**: FP7, INTERREG, Eurostar, Eurêka, etc.

Only a very few of them involve Pôle Véhicule du Futur as a whole partner. Indeed, it is not the cluster's policy to take part in as many projects as possible, unless it can support cluster management. Apart from approving proposals, in most of the cases **the automotive cluster gives businesses assistance in searching the matchable** (local, national or European) **partners to form the right consortium, finding the most suitable RTDI initiatives and writing down the project proposals**, if necessary.

The labelled projects are **both directed towards basic research and applied research**. Cluster members, both research laboratories and businesses, seize the opportunity of all available European, national and regional RTDI programmes (see also related part in this report). Field tests are part of them. **Applied research is more frequent** within the cluster's activities, which seems to be in line with its activities and objectives.

Regional projects are more orientated towards one single sector (automotive sector). Cross-sectorial initiatives are rare and must obviously be extended (the table below doesn't show cross-sectorial projects as only one thematic focus was chosen for each project). The participation of Pôle Véhicule du Futur in the ELMOs project is motivated by the requirement need to share expertise in the three sectors of energy, ICT and transportation with other leading European clusters.

Table 4-2 Number of Projects by Type of Projects by Thematic Focus

	DS	CH	SG	ICT	GE	MS	O
Basic Research	13	1					4
Applied Research	27	7				6	4

DS = Drive Systems CH = Charging SG = Smart Grids ICT = ICT MS = Mobility Services O = Other

The **62 electromobility-related projects** since 2005 deal with:

- **Urban planning** (city logistics, traffic simulation, public transport);
- **Innovative car components** (materials, air cooling, engine, battery, fuel cell technology);
- **Pilots** (real-life field tests involving electric cars);
- **Charging infrastructure;**
- **Smart vehicles** (connected cars, HMI, driving assistance);
- **Experimental vehicles** (hydrogen, new concepts).

The outputs of those projects are of different nature:

- Network of European partners in e-mobility (clusters and research laboratories);
- Electromobility pilots;
- New concepts in electric vehicles;
- New drive systems, new car architectures and new technology development for the car industry.

Among the 62 projects above-mentioned, only **8 projects focused on electromobility and the use of electric cars in integrated transportation systems** were eventually described in a more detailed way (see also Appendix A3 - Electromobility-related Projects for more details). They are not representative of the whole labelled electromobility-related projects but give a nice **overview of initiatives that could be developed at the consortium level as cross-border field tests.**

The table below summarises the assessment of projects linked to electromobility in Alsace and Franche-Comté.

Figure 4-3 Assessment of electromobility-related R&D Projects

<i>Which aspects would you want to keep or improve?</i>	<i>Which aspects would you like to develop or strengthen?</i>
Retain	Enable
Aspect 1: Systematic expertise of project proposals by high-level expert group on behalf of the cluster Aspect 2 Aspect 3	Aspect 1: More cross-sectorial projects Aspect 2: More EU projects Aspect 3: Good involvement of main research laboratories in collaborative innovation projects
<i>Which aspects would you want to abandon or replace?</i>	<i>Which aspects would you like to circumvent/stay clear off?</i>
Eliminate	Avoid
Aspect 1: "Top-down" projects where project proposals are amended by State officers without taking into account local challenges / realities Aspect 2 Aspect 3	Aspect 1: More administrative burdens (national and EU projects) Aspect 2 Aspect 3

4.5 Summary – RTDI Infrastructures

Giving the facts in a nutshell, **Alsace and Franche-Comté have globally the RTDI infrastructures to address new technological challenges of future electric cars**: a large public and private automotive research network, a broad panel of funding schemes and a comprehensive experience of over 60 electromobility-focused projects (basic and applied research).

Of course, the present regional analysis foresees **significant potential to increase the performance of the regional RTDI system as a whole**. There is for instance scope for improvement, especially concerning the simplification of bureaucratic procedures, the rationalisation of innovation players and schemes, the capacity of public research to partly put general economic concerns to the fore, and the will to increase regional RTD expenditure up to the ideal threshold of 3% share of GDP.

The main factor hindering a faster uptake of green mobility in Alsace and Franche-Comté is not necessarily linked to the RTDI infrastructure but may be a **structural issue**: electric car sales far below expectations, which make businesses reluctant in investing in electromobility-related research.

However, the Alsace and Franche-Comté regions are **not in the position to achieve alone the development of state-of-the-art, cross-sectorial R&D actions** that will lead to the creation of tomorrow’s electric vehicles and new e-mobility concepts. This will only be made possible by taking greater consideration to the potential for excellence of **other ELMOs project’s regions**.

Franche-Comté and Alsace RTDI players can provide ELMOs partners with the following expertise:

- _ Global know-how in drive systems and car manufacturing, in nearly all topics;
- _ Opportunities for innovative companies to work with large private research centres;
- _ Opportunities to develop cross-border educational and professional trainings;
- _ Extensive experience in field tests and EV pilots;
- _ A territory where charging infrastructure is already operating.

On the other side, **Pôle Véhicule du Futur’s members would benefit from the following foreign competencies**, if available:

- _ Smart grids, or more specifically “vehicle-to-grid” expertise;
- _ Power electronics in electric cars;
- _ Renewable energy production for more “sustainable” electricity;
- _ Hydrogen production / storage engineering (energy for future vehicles).

The main aspects of the regional RTDI infrastructures in relation to e-mobility are highlighted below.

Figure 4-4 Alsace/Franche-Comté – Assessment of the regional electromobility-related RTDI Infrastructures

<i>Which aspects would you want to keep or improve?</i>	<i>Which aspects would you like to develop or strengthen?</i>
<p style="text-align: center;">Retain</p> <p>Aspect 1: World-class expertise in drive systems and car manufacturing</p> <p>Aspect 2: Comprehensive experience of electro-mobility projects</p> <p>Aspect 3: Variety of funding schemes</p>	<p style="text-align: center;">Enable</p> <p>Aspect 1: Real cross-sectorial approach</p> <p>Aspect 2: More market-oriented research</p> <p>Aspect 3: Rationalisation of innovation players and schemes</p>
<i>Which aspects would you want to abandon or replace?</i>	<i>Which aspects would you like to circumvent/stay clear off?</i>
<p style="text-align: center;">Eliminate</p> <p>Aspect 1: Public and private researches living in two separate worlds</p> <p>Aspect 2</p> <p>Aspect 3</p>	<p style="text-align: center;">Avoid</p> <p>Aspect 1: Bureaucratic procedures, to be simplified</p> <p>Aspect 2: Lower investments in RTDI</p> <p>Aspect 3</p>

5 RDCs – AN ECONOMIC PERSPECTIVE



Research-driven Cluster (RDC) can be defined as clusters that rely predominately on R&D as source of innovativeness and competitiveness. Like technology and innovation clusters they associate enterprises, universities, research organisations, public authorities, and other stakeholders. However, they but differ from those by the fact that they have a stronger science/research base, and by their ability to generate a greater frequency of innovative enterprises able to commercialise and exploit research. They play a vital role in strengthening the research and innovation potential of European regions and are seen as enabler for smart and sustainable growth.



RDCs entail a high potential to stimulate (electromobility-related) RTDI activities at the regional level and increase the competitiveness of regional economies: highly trained workforce and R&D are among the key conditions for innovation and economic success of a country, a region or a cluster. At the same time, RDCs represents a response to the growing local demand for R&D organisations to contribute more directly with the business and the public administration sectors, by contributing to the creation of public-private partnerships at local level and by creating a bridge among R&D actors, regional administrations and the business community.

Electromobility is no discrete sector, but constituted of the three sectors Automotive, Energy and ICT, represented by the participating RDCs within the ELMOs project.

The purpose of the cluster mapping is to best identify the specific electromobility-related potential of the RDCs according to their sectorial focus sectors and to identify synergies and complementarities bearing the potential for smart specialisation and collaboration as well as for mutual learning.

5.1 Basic Information

Founded in 2005, the cluster **Pôle Véhicule du Futur** (literal translation: “Future Vehicle Cluster”) is the **automotive cluster** of the Eastern part of France. It works in conjunction with **private companies, research laboratories, training centres and local authorities**. The strategy of the cluster is focused on **vehicles and**

technologies for urban and peri-urban mobility, with a view to achieve sustainable development. Based on this strategy, Pôle Véhicule du Futur has **two pillars**:

- 1- Improve the **global competitiveness** of regional industry (PERFOEST initiative, which is not detailed in this report);
- 2- Develop **innovative and collaborative projects** involving companies and research laboratories (Competitiveness Clusters' core activity).

The innovation strategy led by the automotive cluster in Alsace and Franche-Comté results in RTD projects, which are the driving forces in the cluster's dynamics, stimulated by the synergy between industry, education and research. In order to facilitate the emergence of such projects, Pôle Véhicule du Futur is organised in such way to **address 17 strategic business sectors through 5 strategic development programmes**:

- 1- **Mobility Services**: this business sector deals with mobility and society, traffic modelling, simulation and flow management, customised mobility services (e.g. car-sharing / car-pooling / demand-responsive transport) and driver / passenger information (what is sometimes defined as "infomobility");
- 2- **Infrastructures & Communication**: also known as "smart mobility", this area is mainly related to the interactions between drivers / passengers and vehicles, or vehicles and road infrastructure ; Human-Machine Interface (HMI), on-board, embedded and cooperating systems as well as charging infrastructures are the strategic business sectors addressed within this programme;
- 3- **Energy & Propulsion** gathers all research topics related to the in-vehicle drive systems: hybrid and electric powertrains, fuel cell integration, cockpit thermal comfort and Internal Combustion Engine (ICE) environment;
- 4- **Design, Materials & Life-cycle** is the business area of cockpit and interior design, including industrial processes, with a focus on innovative materials (plastics, metallic alloys, composite materials, nanotechnology): materials functionalities, vehicle interior design, Life Cycle Analysis (LCA) and CO2 impact, car assembly solutions and product design tools;
- 5- **Innovative Vehicles** embraces the broad topic of new vehicle architecture and concepts (including breakthrough innovations).

Table 5-1 RDCs Finance by Source of Funding

	Share of Source of Funding (%)				
	Total Budget (€)	PUB	MF	SF	PRO
2009	1 113 000	975 000	62 000	76 000	0
2011	1 148 000	846 000	145 000	102 000	55 000

PUB = Public Funding MS = Membership Fees SF = Service Fees PRO = Projects

Pôle Véhicule du Futur expands every year. **In 2011, 200 members joined the cluster**, versus 141 members in 2009 and 168 in 2010. Out of 200, **160 members are private companies**. Pôle Véhicule du Futur's foundation can be defined like a **combination of SMEs & large companies**. The cluster is **well balanced** as regards the share

of members of the Triple Helix and pools the forces of enterprises, universities, research organisations and policy makers to expedite the market penetration of innovative future mobility solutions through collaboration projects. However, **1,105 enterprises are based in regions Alsace and Franche-Comté** while operating in at least one of the three following sectors: **automotive / transport / mobility services**. In other words, they constitute the **target group** of Pôle Véhicule du Futur in its quest to gain more business members. The 200 cluster members (2011 figures) are included in this pool of local enterprises.

Pôle Véhicule du Futur is a **non-profit organisation** supported by **public and private funding**. Public funding accounts for 73.7% of the cluster's budget, of which the **lion's share comes from regional government**, including subsidies from local authorities (urban communities, cities), county councils and regional councils. However, the official accountancy rules do not take into account the fact that 3 assigned employees from PSA Peugeot Citroën are fully involved in the cluster management, which makes de facto the **cluster half funded by the private sector**. In 2011, a total of **14.5 Equivalent Full Time (EFT) staff members** took part in the cluster management.

5.2 Foundation

Despite the fact that the **cluster's internal awareness of the relevance of electromobility**, including fuel cell technology and hydrogen vehicles, **is pretty high**, **external recognition** of the cluster **can still be largely improved** in this business area.

The frequency of occurrence of the relationships in the cluster is quite different according to the type of actors. **While cooperation partners and public partners are exchanging a lot thanks to the cluster, it is less frequent for competitors**. On the other side, it has no particular influence on the relationships for auto industry suppliers for instance.

Knowledge transfer mechanisms within the cluster are the ways information about technology developments, business opportunities and funding instruments transit between each member. The mobility of employees, researchers and students are also in the scope.

In this case, Pôle Véhicule du Futur acts as a **platform for the exchange of ideas** and has a **globally positive impact on knowledge transfer**. **Technology and business opportunity watches** are one core activity of the cluster. **Thematic working groups** (*Groupes d'Innovation Technologique*) meet regularly to discuss and set up collaborative projects together. Such meetings are appreciated by companies, especially SMEs, as they can share their professional views on the state-of-the-art developments in their own business area, namely **car materials, hydrogen vehicles, charging infrastructure, innovative vehicles and mobility services**. Along with social networking, more **formal meetings** are also organised to help enterprises **expanding their commercial network**. Thus, 5 large gatherings are planned in 2012 in the main cities of Alsace and Franche-Comté.

The **main areas of cooperation in the cluster** are:

- Strategic vision on innovation;
- Enterprise competitiveness;
- Cluster promotion;
- Research & Development;
- Training & Higher Education;
- International trade missions.

The mobility of employees and students is the area where most remains to be done. This weakness must be addressed both **within the regional frame**, where public and private research entities often act like they live in two separate worlds; and **at the European level**, because the mobility of researchers is not enough promoted (apart from student's Erasmus programme which is very popular). **Not only language barriers, but also cultural behaviours are singled out.**

Qualified personnel in electromobility are rather available in the cluster. It has a **comprehensive electromobility-related higher education and training offer**. By contrast, the cluster **does not easily attract highly qualified personnel** to Alsace and Franche-Comté. As said previously, researchers' mobility outside the cluster remains low, which is believed to indirectly slow down innovation spreading.

Tailoring the training to meet the regional companies' (future) needs is essential. It is one of Pôle Véhicule du Futur the cluster's activities to **encourage and support partnerships between primary / higher education centres (Universities and High Schools of Engineers), business partners and industry**. In 2011 Pôle Véhicule du Futur carried out a **survey of the existing education and training offer**: there are about **200 courses** in regions Alsace and Franche-Comté in conjunction with the cluster's strategic areas (mainly in the automotive sector). Regarding electromobility, a post baccalaureate training program "Maintenance of Electric Vehicles" has been co-initiated by the cluster. Last but not least, the cluster is in the process of supporting the creation of a new, ambitious 5-year master degree in sustainable mobility and is willing to be pro-active in the emergence of new offers in the future. **What is missing is a true cross-sectorial training and education offer** addressing the arrival of electric cars and new related technologies and usages.

There is a little, emerging demand for electromobility at the regional level. In France, the introduction of electric vehicles in a massive way is rather reclaimed by the general public, along with other sustainable transport options. However, electric car sales (EV and HEV) are still on a very low level (2,630 new EV sold in 2011, i.e. 0.12% of new vehicle national market).

Various consumer studies carried out recently report that **purchase price and lack of driving range of electric cars are the two main barriers to EV / HEV ownership**. Another frequent concern is the articulated need of **available public charging infrastructure**, bearing in mind the fear of low mileage. As a consequence we can say that a demand for electromobility by citizens does exist (virtual demand is high) but is still facing important technical and societal burdens.

Local rules and incentives exist in order to influence the demand for electromobility:

- _ Car-free / “Car-light” city centres in main cities of Franche-Comté and Alsace;
- _ Ongoing roll-out of charging infrastructure in pilot cities (e.g. Strasbourg);
- _ Strong political will to support local car manufacturers and automotive sector;
- _ Advertising campaigns by car makers and public bodies underpinning the introduction of next-generation electric cars into the domestic market.

At the national level, **consumer purchase incentives for electric cars are up to 5,000€** (car bonus / penalty system). The maximum is available for Battery Electric Vehicles (BEVs). **In Alsace, there is an additional condition-based incentive of 5,000€** (for the first 500 citizens and very small companies). In Franche-Comté, there is no such regional complementary consumer incentive but the region supports the purchase of electric cars for car-sharing services.

Local and regional demands for electromobility are largely **stimulated by public procurement**. However, local public procurements remain marginal: only a few vehicles are generally bought at each time. It must be pointed out that **18 major French companies teamed up in 2011 to organise one unique call for tenders for the purchase of electric cars** (50,000 vehicles to be delivered between 2012 and 2015, according to the plan). Local administrations are invited to integrate a growing number of electric vehicles in their own fleet.

Pôle Véhicule du Futur has currently **no electromobility development strategy as such**. As part of its global Competitiveness Cluster's strategy, it has identified **emerging key markets** for the benefit of its members:

- 1- Automotive parts (e.g. air conditioning, embedded systems, lighter vehicles);
- 2- Innovative vehicles (e.g. car-sharing, urban delivery, utility vehicles);
- 3- Innovative mobility services (e.g. public / shared use of vehicles, charging infrastructure);
- 4- Vehicle recycling / circular economy.

Electromobility is seen as a transversal topic rather than a specific market. The development of electric cars and vehicles is at the heart of several Pôle Véhicule du Futur's strategic areas: **car-sharing services, tailor-made vehicles for urban logistics** (electric “last mile”) **and technical services** such as refuse collection, **smart cars, integrated transportation systems** involving collective and individual means of transport and of course **charging infrastructure**. **Electromobility is officially advocated by Pôle Véhicule du Futur** as a cluster, especially in the form of promotion of EV / HEV pilots.

The assessment of the current cluster’s foundation in regard to ELMOs project’s objectives is summarised in the table below.

Figure 5-1 Assessment of RDCs Foundation

<i>Which aspects would you want to keep or improve?</i>	<i>Which aspects would you like to develop or strengthen?</i>
<p>Retain</p> <p>Aspect 1: Good regional educational offer</p> <p>Aspect 2: Knowledge transfer mechanisms within the cluster</p> <p>Aspect 3</p>	<p>Enable</p> <p>Aspect 1: Improved mobility of researchers, incl. improved capacity to attract highly qualified personnel</p> <p>Aspect 2: Extend the external recognition of the cluster’s activities in electromobility</p> <p>Aspect 3: Create more cross-sectorial education and training opportunities</p>
<i>Which aspects would you want to abandon or replace?</i>	<i>Which aspects would you like to circumvent/stay clear off?</i>
<p>Eliminate</p> <p>Aspect 1: Lack of employees’ mobility</p> <p>Aspect 2</p> <p>Aspect 3</p>	<p>Avoid</p> <p>Aspect 1: Cutting off consumer incentives</p> <p>Aspect 2: Lack of political support for electric mobility</p> <p>Aspect 3: Loss of cluster members</p>

5.3 Competitiveness

Pôle Véhicule du Futur is one of the three major automotive clusters in France. Since the auto industry acknowledges a **diversification of its activities** (electronics, telecommunications, nanotechnology, new car components), many links to other technology areas are emerging.

The cluster is important in term of employment. In **Franche-Comté**, the auto industry represents **almost 9% of local employment** against only **2.2% in Alsace**, although this can be explained by the fact that this region has other key sectors of excellence. Franche-Comté’s number of employees is half lower than in Alsace. In both regions, those rates are **above the national average**, which is of 2%.

Pôle Véhicule du Futur, as a group of closely related and complementary industries operating within a small territory, **contributes positively in the regional economic performance.** At the national level, a previous assessment of the cluster policy and its significance shows that **companies participating in a strong cluster register higher employment growth as well as higher growth of wages, number of establishments, and patenting.** Additional benefits appear with a network of other thematic clusters in adjacent regions. Importantly, there is also evidence that new industries emerge where there is a strong cluster environment. Pôle Véhicule du

Futur fully **contributes to the regional image and branding** as well as to the technological development both for laboratories and enterprises. However, when it comes to **skills development**, the cluster has **less important impacts** maybe because this aspect involves many other partners (education / training).

Regarding the positive effects on local productivity, labour market and increased income, it is difficult to gauge it since the sector in France, and partly in Europe, is “bleeding jobs” (e.g. PAS Peugeot Citroën announced in Spring 2012 a large-scale cutting of 8,000 jobs across the country). In a general context of structural problem, namely a general overproduction, the cluster’s activities are believed to **soften the loss of employment against the status quo scenario** (“business as usual” scenario), which would consist in imagining a future in which all trends were to continue unabated.

The cluster is the **main regional advocate of electromobility** and contributes to shifting position lines on the regional level, at least in the local RTDI ecosystem. Pôle Véhicule du Futur has **bet on the improvement of the situation for the automotive sector partly thanks to the development of low-carbon vehicles**, including electric cars (HEVs and BEVs). If the cluster’s future development is very likely linked to the uptake of electric mobility, in terms of employment and turnover growths, the **regional socio-economic players will have to cope with two distinct challenges:**

- To massively support many **traditional companies** into innovation as **electric car-related new technology represents a major shift, if not a serious threat to their future health;**
- To **give rise to new innovative companies**, to attract new electromobility players or to foster partnerships between strategic players in order to **keep competitive advantage and market leading position** in Alsace and Franche-Comté.

Unfortunately, **employment growth is expected to be negative** as the regional automotive sector is currently undergoing a severe crisis. It is expected today that the take-up of electromobility will be slow and gradual at least for the next five years.

According to the topics defined in the Regional Analysis in the framework of the ELMOs project, the **cluster’s core competencies** are as follows:

- 1- **Drive Systems:** HEV and EV component / module / system / vehicle, from design to industrialised production, e.g. engines, air cooling systems, smart sensors, body structure, electronics, car parts, electric engine, fuel cell systems;
- 2- **Charging:** charging stations, interface with smart grids;
- 3- **Mobility Services:** car-sharing services, mapping, car park infrastructure and management;
- 4- **ICT:** driver assistance systems, human-machine interfaces, traffic simulation, smart sensors and systems, embedded systems, connected vehicles, car-to-car and car-to-road communications;
- 5- **Green Energy:** hydrogen energy supply and storage for prototype vehicles.

The cluster is **well renowned nationally**. Its **influence also extends beyond France's borders**, furthering the country's reputation as a European actor and innovator in the car industry. Its **internationalisation**

performance is lower in the rest of the world. It is the ambition of Pôle Véhicule du Futur to increasingly become an important player on the European scene. The cluster is more known for its long history of car production (in link with Peugeot historic headquarters) than its efforts in electromobility-related RTDI activities. There are **only a few laboratories with combine a clearly world-class reputation with a European identity**, among them are FEMTO-ST with its research programmes in micro-nano-technology and FC LAB working on fuel cell systems.

The cluster's competitiveness is summarised in the table below.

Figure 5-2 Assessment of RDCs Competitiveness

<i>Which aspects would you want to keep or improve?</i>	<i>Which aspects would you like to develop or strengthen?</i>
<p>Retain</p> <p>Aspect 1: Cluster's global impact on local economy</p> <p>Aspect 2: Cluster's positive role in advocating electromobility</p> <p>Aspect 3</p>	<p>Enable</p> <p>Aspect 1: Reputation of Pôle Véhicule du Futur on the European scene as a leading, competitive automotive cluster</p> <p>Aspect 2: Give rise to new companies and attract new electromobility players to keep competitive advantage and market leading position locally</p> <p>Aspect 3</p>
<i>Which aspects would you want to abandon or replace?</i>	<i>Which aspects would you like to circumvent/stay clear off?</i>
<p>Eliminate</p> <p>Aspect 1</p> <p>Aspect 2</p> <p>Aspect 3</p>	<p>Avoid</p> <p>Aspect 1 : Disappearance of traditional companies by lack of innovation</p> <p>Aspect 2: On-going massive job shedding</p> <p>Aspect 3</p>

5.4 Cluster Dynamics

Innovation does exist under different forms. It is not only related to innovative vehicles (design and production) but also embraces new processes, social organisations and tailor-made services to the end-users. Pôle Véhicule du Futur is **primarily concerned by design, process and product innovations**. Social and service innovations are of less importance, however they are not excluded from the cluster's spectrum of activities.

They are **6 new foundations in the cluster since 2009**. Five of them are start-ups and the last one is a spin-off. If the last three years are considered, **the creation of new companies within the automotive cluster is in progress**: 4 new foundations in 2011 versus only one in 2010 and one in 2009.

Unfortunately, the cluster **doesn't manage to attract external companies** in its network. If it is difficult to find out the reasons of this situation, some explanations can still be proposed:

- The cluster is focused on supporting already existing businesses but hasn't paid so far too much attention on entrepreneurs with promising business ideas and on newly created companies; in this area Universities and research laboratories seem to be more active.
- Some economic players are more specifically working in this area, e.g. Chambers of Commerce
- The current crisis tragically implies more business disappearance than creation;
- The reputation of the Eastern part of France is not as good as in other more attractive regions (it is true at least in France);

Pôle Véhicule du Futur must globally improve its attractiveness to entrepreneurs as well as national and foreign enterprises, and **create stronger relationships** with public organisations which are involved in supporting the creation of start-ups.

There are several core cluster management competencies within the cluster. The most important one is to support RTDI projects and **from-idea-to-market activities** among the regional enterprises in the three sectors of automotive, land-transport and mobility services. Entrusted with the continuous watch over technological developments, the cluster provides their members with a **strategic vision of tomorrow's key innovation technologies and new markets**. Pôle Véhicule du Futur also develops business opportunities for cluster members, from formal meetings to international trade missions; and offers training courses and tools to improve competitiveness of local industrial enterprises. From a more general perspective it is an economic player which fosters **SME development** to achieve more balanced relationships between small and large companies and take part in regional promotion to **attract investments and create jobs locally**.

Of course, Pôle Véhicule du Futur principally operates through consultation and a strong system of working committees, task forces and **mobility user groups**. In Alsace and Franche-Comté, the cluster can rely on the involvement of **private passenger transport companies** and **large employers with their own fleets of vehicles** (private companies or public administrations), as well as **logistics companies** regarding low-carbon "last mile" deliveries. For example, a strong relationship has been created between the cluster and La Poste Group (postal services). **Local authorities are pleased to welcome innovative vehicles and pilots for a trial period**: electric cars (car-sharing service) in Montbéliard, refuse collectors in Dole, hydrogen buses in Belfort, etc. Because they are not concerned by the cluster's B2B approach, private households are not directly linked to Pôle Véhicule du Futur as end-users. However, trends are changing as the cluster will be soon involved in the set-up of an EV driver club in Alsace at the end of 2012. Thus, Pôle Véhicule du Futur enjoys the **active support of many local mobility user groups**, which are regularly involved in pilots and RTDI projects as end-users.

Pôle Véhicule du Futur, like other Competitiveness Clusters labelled by the French State, has its **cluster actions evaluated every three years**. Its objective contract is prepared by local players, following a national template common to all Competitiveness Clusters. In this way, the cluster outlines various objectives not always coherent. On the one hand, it acts as a public agency to implement a national "top-down" cluster policy, which must also

obey some constraints concerning regional planning and other public issues. On the other hand, it is a legitimate representative of regional companies (who support it financially) with whom it has close relationships.

In the 3-year performance contract of the cluster, the following **16 quantitative objectives** are stated:

- Governance and coordination : number of cluster members;
- RTDI projects : number of projects appraised (labelled) by Pôle Véhicule du Futur and number of projects financed;
- Innovation platform projects : number of innovation platform projects appraised (labelled) by Pôle Véhicule du Futur and number of projects submitted to national calls for proposals;
- Territorial attractiveness : number of companies created in conjunction with cluster activities;
- SMEs : number of SMEs involved in projects appraised (labelled) by Pôle Véhicule du Futur;
- Human resources : number of companies involved in technology working groups and collaborative actions (e.g. training courses, business meetings);
- Skill management : number of training offers appraised (labelled) by Pôle Véhicule du Futur;
- Sustainable development : number of projects appraised (labelled) by Pôle Véhicule du Futur in regard to sustainable development;
- International profile : number of companies involved in international trade missions ; number of partnership agreements with foreign clusters ; number of European projects appraised (labelled) by Pôle Véhicule du Futur;
- Private funding : number of business contacts facilitated between SMEs and business angels / venture capitalists;
- Economic impacts : number of patent applications by cluster members in conjunction with Pôle Véhicule du Futur's activities.

Since its creation in 2005 Pôle Véhicule du Futur **has learned from its cluster management practices** and eventually has adopted what we can consider as **good practices**. Among them, 4 best practices could be shared with other ELMOs project's partners. First of all, a cluster has to permanently **collect and meet the needs** of its members. It must put a lot of efforts on developing a **clear strategic development** along with the establishment of clear and measurable objectives. The **balanced governance** (small / large enterprises, public / private bodies, research / industry / business) is also seen as something crucial. Last but not least, **adequate resources** to support cluster activities are required; it is believed that a critical mass of staff is needed to achieve relevant tasks that benefit the regional economic fabric.

Learning from its experience, Pôle Véhicule du Futur has identified some **pitfalls in cluster management**. Generally speaking, clusters must avoid the following:

- _ One or very few major stakeholders in the cluster’s governance ;
- _ Try to lead projects instead of supporting companies / consortiums leading their own initiatives ;
- _ Mix up political and business activities.

A summary of the assessment of Pôle Véhicule du Futur’s cluster dynamics is presented in the table below.

Figure 5-3 Assessment of RDCs Dynamics

<i>Which aspects would you want to keep or improve?</i>	<i>Which aspects would you like to develop or strengthen?</i>
<p style="text-align: center;">Retain</p> <p>Aspect 1 : Good involvement of mobility user groups and local authorities which facilitates pilot projects</p> <p>Aspect 2: Focus on design / product / process innovations</p> <p>Aspect 3</p>	<p style="text-align: center;">Enable</p> <p>Aspect 1: Creation of more new businesses within the cluster</p> <p>Aspect 2: More visits to companies</p> <p>Aspect 3: Enhanced regional attractiveness at the European level</p>
<i>Which aspects would you want to abandon or replace?</i>	<i>Which aspects would you like to circumvent/stay clear off?</i>
<p style="text-align: center;">Eliminate</p> <p>Aspect 1: Unbalanced relationships between SMEs and large companies</p> <p>Aspect 2</p> <p>Aspect 3</p>	<p style="text-align: center;">Avoid</p> <p>Aspect 1: Lose the “Competitiveness Cluster” label granted by the French State</p> <p>Aspect 2</p> <p>Aspect 3</p>

6 ENTREPRENEURIAL BASE

This part presents both the enterprises which are actively involved in the automotive cluster as members and the companies working in the field of electromobility.

The entrepreneurial base of Pôle Véhicule du Futur is made of **160 companies** which are officially **members of the cluster** (in 2011), therefore **representing 80% of all members**. Those businesses comprise of a large variety of organisations, from start-ups to major OEMs. There is no surprise that the majority of them are linked to the **automotive industry**. **Tier-1, 2 and 3 suppliers** are the largest group of companies within the cluster. Other enterprises deal with transport-related ICT and mobility services. Only a small minority of them are linked to the green energy sector.

Among those 160 businesses, there is no balance in the size of organisations:

- **SMEs are making the bunch of the cluster's entrepreneurial base** (60%);
- Intermediate-sized enterprises are under-represented (13%);
- Large companies account for just over a quarter of all cluster members (27%).

Regarding the **149 electromobility-related companies** (see Appendix A4 - List of Enterprises for more details) and their specific role in the value chain, a few important facts must be acknowledged:

- There are 77 businesses involved in electromobility out of 160 cluster members, that is to say only half of them. One must bear in mind that electromobility is not the sole main strategic business area Pôle Véhicule du Futur wants to address;
- **72 companies** in Alsace and Franche-Comté are directly or indirectly related to electromobility but are **outside the cluster network**. Efforts have to be made to target them as potential members;
- 38 of all electromobility-related companies have more than 250 employees (**25%**); they are **large enterprises** according to the common definition adopted by the ELMOs consortium;

- **“Drive systems” is the main topic in which regional firms are involved**; the detailed typology is as follows (one company may be involved in several sectors):
 - **68%** of electromobility-related companies are involved in **“Drive Systems”**;
 - 5% in **“Charging”**;
 - 1% in **“Smart Grids”**;
 - **20%** in **“ICT”**;
 - 6% in **“Green Energy”**;
 - **12%** in **“Mobility Services”**.

As already said many times in the present report, Pôle Véhicule du Futur is mainly focused on the drive systems and car manufacturing. In regard to the value chain of e-mobility, in very general terms, there are **local, relevant skills and resources** in ICT, charging infrastructure, mobility services and green energy but those are **not leading sectors at the regional level**. There is a political and economic will to create a whole electromobility ecosystem on the territory however to achieve this goal **cutting-the-edge technology, expertise and knowledge would probably come from European partners**.

The assessment of Pôle Véhicule du Futur’s entrepreneurial base in regard to ELMOs project’s objectives is summarised in the table below.

Figure 6-1 Assessment of Entrepreneurial Base

<i>Which aspects would you want to keep or improve?</i>	<i>Which aspects would you like to develop or strengthen?</i>
Retain	Enable
Aspect 1: Encourage cluster members to explore new electromobility markets (in the future only if EV sales become more significant) Aspect 2: Aspect 3	Aspect 1: Increase the number of cluster members by prospecting regional businesses Aspect 2: Attract non-member electromobility-related companies into the cluster (more specific and strategic objective) Aspect 3
<i>Which aspects would you want to abandon or replace?</i>	<i>Which aspects would you like to circumvent/stay clear off?</i>
Eliminate	Avoid
Aspect 1 Aspect 2 Aspect 3	Aspect 1: Stay restricted to the automotive sector without working with ICT and energy sectors and creating regional expertise in those two sectors Aspect 2 Aspect 3

Appendices

A1 List of Electromobility-related Research Entities

Name of Organisation	Type of Organisation*						Number of Researchers	Sector**			
	SF	UAS	PUB	PRIV	CRC	TTC		A	I	E	M
Université de Strasbourg (UdS), Image & Ville (Laboratoire Image, Ville, Environnement)	x								x		x
Université de Strasbourg (UdS), LSIIT (Laboratoire des Sciences de l'Image, de l'Informatique et de la Télédétection)	x							x	x		x
Université de Strasbourg (UdS), LSP (Laboratoire des Systèmes Photoniques)	x							x			
INSA de Strasbourg, ERGE (Equipe de Recherche en Génie Electrique)		x						x			
Ecole Nationale Supérieure d'Ingénieurs Sud Alsace (ENSISA)		x						x	x		
Institut FC LAB (Fuel Cell Lab)			x					x		x	
Université de Technologie de Belfort Montbéliard (UTBM), M3M (Mécatronique Méthodes, Modèles et Métiers)	x							x	x		
Université de Technologie de Belfort Montbéliard (UTBM), SET (Systèmes et Transports)	x							x	x		x
Institut FEMTO-ST, ENISYS (ENergie et Ingénierie des SYStèmes multiphysiques)			x					x		x	
Institut FEMTO-ST, DMA (Département de Mécanique Appliquée)			x					x			
Institut FEMTO-ST, OPTIQUE (Département d'Optique)			x						x		
Université de Franche-Comté (UFC), LIFC (Laboratoire d'Informatique de Franche-Comté)	x								x		x
Université de Franche-Comté (UFC), THéMA (Théoriser et Modéliser pour Aménager)	x										x
Ecole de Management de Strasbourg, CESAG (Centre d'études des sciences appliquées ^ la gestion)		x									x
Université de Strasbourg (UdS), CSE (Laboratoire Cultures et Sociétés en Europe)	x										x

(*) U = University UAS = University of Applied Sciences PUB = Public Research Entity PRIV = Private Research Entity CRC = Collaborative Research Centre TTC = Technology Transfer Centre

(**) A = Automotive I = ICT E = Energy M = Mobility

Name of Organisation	Type of Organisation*						Number of Researchers	Sector**			
	SF	UAS	PUB	PRIV	CRC	TTC		A	I	E	M
Université de Strasbourg (UdS), CRESS (Centre de Recherche et d'Etudes en Sciences Sociales)	x										x
Institut d'Electronique du Solide et des SystèmesInEss (Institut d'Electronique du Solide et des Systèmes)			x					x		x	
FAURECIA, Entreprise (internal RTDI activities)				x				x			
PARKEON, Entreprise (internal RTDI activities)				x						x	x
COOLTECH APPLICATIONS, Entreprise (internal RTDI activities)				x				x			
DELPHI MECHATRONICS SYSTEMS, Entreprise (internal RTDI activities)				x				x			
CLEMESSY, Entreprise (internal RTDI activities)				x				x			
A RAYMOND, Entreprise (internal RTDI activities)				x				x			
ORANGE LAB, Entreprise (internal RTDI activities)				x					x		
FAM Automobile, Entreprise (internal RTDI activities)				x				x			
HAGER ELECTRO SAS, Entreprise (internal RTDI activities)				x						x	
SCHRADER SA, Entreprise (internal RTDI activities)				x				x			
PLASTIGRAY SA, Entreprise (internal RTDI activities)				x				x			
MAGNA STEYR France, Entreprise (internal RTDI activities)				x				x			
L&L PRODUCTS, Entreprise (internal RTDI activities)				x				x			
FABI Automobile, Entreprise (internal RTDI activities)				x				x			
BEHR FRANCE, Entreprise (internal RTDI activities)				x				x			
LISI Automotive, Entreprise (internal RTDI activities)				x				x			

(*) U = University UAS = University of Applied Sciences PUB = Public Research Entity PRIV = Private Research Entity CRC = Collaborative Research Centre TTC = Technology Transfer Centre

(**) A = Automotive I = ICT E = Energy M = Mobility

Name of Organisation	Type of Organisation*						Number of Researchers	Sector**			
	SF	UAS	PUB	PRIV	CRC	TTC		A	I	E	M
PSA PEUGEOT CITROEN, Enterprise (internal RTDI activities)				x				x			
SEGULA, Enterprise (internal RTDI activities)				x				x			
ALSTOM TRANSPORT, Enterprise (internal RTDI activities)				x				x			
LOHR INDUSTRIE, Enterprise (internal RTDI activities)				x				x			
GENERAL MOTORS POWERTRAIN, Enterprise (internal RTDI activities)				x				x			
ASSYSTEM France, Enterprise (internal RTDI activities)				x				x			
MARK IV SYSTEMES MOTEURS SA, Enterprise (internal RTDI activities)				x				x			
BOURBON TECHNOLOGIE, Enterprise (internal RTDI activities)				x				x			
CLARIANT, Enterprise (internal RTDI activities)				x				x			
ITT CANNON, Enterprise (internal RTDI activities)				x				x			
BECKER ELECTRONIQUE, Enterprise (internal RTDI activities)				x				x	x		
VIVERIS, Enterprise (internal RTDI activities)				x					x		

(*) U = University UAS = University of Applied Sciences PUB = Public Research Entity PRIV = Private Research Entity CRC = Collaborative Research Centre TTC = Technology Transfer Centre

(**) A = Automotive I = ICT E = Energy M = Mobility

A2 List of Financial Actors & Instruments

Name of Organisation	Type of Instrument*										Scope			Sector**				
	BL	AF	CF	G	MC	MF	RC	SF	VC	O	R	CR	N	A	I	E	M	N
CDC / FNA (Fonds National d'Amorçage)	x												x		x			x
Investment funds for equity financing of innovative SMES																		
OSEO / Renforcement de la compétitivité des PMI et des filières industrielles stratégiques				x									x		x			x
Guarantee fund (interest-free advance) to improve competitiveness of industrial SMEs and strategic industrial sectors																		
OSEO / Aidesâ la réindustrialisation				x									x		x			x
OSEO / Prêts verts	x												x		x			x
OSEO /CDP (Contrats de Développements Participatifs)	x												x		x			x
OSEO / Projets de recherche et développement structurants des Pôles de Compétitivité	x												x		x			x
ANR-CDC / France Brevets	x												x		x			x
ANR / Crédit d'Impôt Recherche (CIR)	x												x		x			x
OSEO / Aide pour la faisabilité de l'innovation	x												x		x			x
OSEO / APT (Aide au Partenariat Technologique)	x												x		x			x
OSEO / PTR (Prestation Technologique Réseau)	x												x		x			x

(*) SF = Seed Fund AF = Business Angel Fund CF = Crowd Funding BL = Bank Loan VC = Venture Capital G = Guarantee

(**) R = Regional CR = Cross-regional N = National

(**) A = Automotive I = ICT E = Energy M = Mobility

Name of Organisation	Type of Instrument*										Scope			Sector**				
	BL	AF	CF	G	MC	MF	RC	SF	VC	O	R	CR	N	A	I	E	M	N
OSEO / Aide aux jeunes pour l'innovation																		
OSEO / Aide au transfert de technologies pour les organismes publics de recherche													X					X
OSEO / Aide à la création d'entreprise innovante													X					X
OSEO / Aide pour le développement de l'innovation																		
OSEO / Aide à l'innovation "Passerelle"	X												X		X			X
OSEO / ISI (Aide aux projets d'Innovation Stratégique Industrielle)	X												X		X			X
OSEO / PPA (Prêt Participatif d'Amorçage)	X												X		X			X
OSEO / CDI (Contrat de Développement Innovation)	X																	
OSEO / GI (Garantie Innovation)				X									X		X			X
OSEO / GCPI (Garantie de Caution sur Projets Innovants)				X									X		X			X
OSEO / Aide pour le développement de l'innovation	X																	
OSEO / Aide au transfert de technologies pour les organismes publics de recherche	X												X		X			X
OSEO / Aide à la création d'entreprise innovante	X												X		X			X
FSI / FCID (Fonds de Co-Investissement Direct)							X						X		X			X

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(**) A = Automotive I = ICT E = Energy M = Mobility

(**) R = Regional CR = Cross-regional N = National

Name of Organisation	Type of Instrument*										Scope			Sector**				
	BL	AF	CF	G	MC	MF	RC	SF	VC	O	R	CR	N	A	I	E	M	N
FSI / FCDE (Fonds de Consolidation et de Développement des Entreprises)							x						x		x			x
MESR / JEU (Jeunes Entreprises Universitaires)	x												x		x			x
MESR / JEI (Jeunes Entreprises Innovantes)	x												x		x			x
A / Alsace Business Angels		x									x				x	x		
A / Alsace Amorèage SAS								x			x				x	x		
A / SODIV SA							x				x				x	x		
A / AIRFI (Alsace Inter Regio Fonds d'Investissement)							x					x			x		x	
A / Alsace Création SCR							x				x				x	x		
A / Fonds Alsace Croissance							x				x				x	x		
A / Fonds Eurefi							x					x			x		x	
A / Fonds Field Sicar							x					x			x		x	
A / Fonds ILP (Institut Lorrain de Participation)							x					x			x		x	
A / FRI (Fonds Régional de l'Innovation)	x										x				x	x		
A / Fonds Régional de Garantie Alsace TPE				x							x				x	x		
A / FRFI (Fonds Régional de Financement Initial)	x										x				x	x		
A / Chèque Innovation	x										x				x	x		
A / Contrat Création-Innovation	x										x				x	x		

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(**) A = Automotive I = ICT E = Energy M = Mobility

(**) R = Regional CR = Cross-regional N = National

Name of Organisation	Type of Instrument*										Scope			Sector**				
	BL	AF	CF	G	MC	MF	RC	SF	VC	O	R	CR	N	A	I	E	M	N
A / Aide à la valorisation	x										x				x	x		
A / Enseignement supérieur et recherche : soutien aux investissements	x										x				x	x		
A / Enseignement supérieur et recherche : soutien à la valorisation des travaux de recherche	x										x				x	x		
FC / Sud Franche-Comté Angels		x									x				x	x		
FC / AIRFI (Alsace Inter Regio Fonds d'Investissement)							x					x			x		x	
FC / Franche-Comté Création 3								x			x				x	x		
FC / Franche-Comté PME 2							x				x				x	x		
FC / Franche-Comté PME 3							x				x				x	x		
FC / Franche-Comté PME Défis 2010							x				x				x	x		
FC / ILP (Institut Lorrain de Participation)							x					x			x		x	
FC / Rhône Dauphine Développement							x					x			x		x	
FC / Capital Investissement Franche-Comté							x				x				x	x		
FC / Capital Risque Franche-Comté							x				x				x	x		
FC / Fonds Régional d'Aide à l'Innovation (FRI)							x				x				x	x		
FC / Aide en faveur de la Recherche et du Développement (R&D) Innovation	x										x				x	x		
FC / Aide au conseil	x										x					x		

(*) SF = Seed Fund AF = Business Angel Fund CF = Crowd Funding BL = Bank Loan VC = Venture Capital G = Guarantee

(**) R = Regional CR = Cross-regional N = National

(**) A = Automotive I = ICT E = Energy M = Mobility

Name of Organisation	Type of Instrument*										Scope			Sector**				
	BL	AF	CF	G	MC	MF	RC	SF	VC	O	R	CR	N	A	I	E	M	N
FC / Fonds Régional de Garantie Franche-Comté				x							x				x	x		
FC / Prêts participatifs d'amorèage	x										x				x	x		

(*): SF = Seed Fund AF = Business Angel Fund CF = Crowd Funding BL = Bank Loan VC = Venture Capital G = Guarantee

(**): R = Regional CR = Cross-regional N = National

(**): A = Automotive I = ICT E = Energy M = Mobility

A3 Electromobility-related Projects

Name of Project	Duration		Budget			Type of Instrument*				Involved Actors**						Thematic Focus***							
	Start	End	Total (€)	Pub (%)	Priv (%)	BR	AR	FT	AT	B	R	P	C	CL	O	DS	CH	SG	ICT	GE	MS	O	
ENEVATE	03/2010	06/2013	5.040.321		100			x		x	x	x		x	x								x
CROME	2011		19.760.000					x		x	x	x	x	x						x			
LEDEME			2.645.000						x	x	x	x				x							
[E].Modal			1.435.000		100			x		x	x	x	x							x			
SIGAS			443.000						x	x	x	x	x	x									
Alsace Auto 2.0								x		x	x	x	x		x								x
Alsace Globale			46.800.000					x		x	x	x	x										x
ELECTROptymo			7.400.000					x		x	x	x	x										x

(*) BR = Basic Research AR = Applied Research FT = Field Tests AT = Application Testing

(**) B = Business Entities R = Research Entities P = Public Authorities C = Citizens CL = Cluster O = Other

(***) DS = Drive Systems CH = Charging SG = Smart Grids ICT = Information- & Communication Technologies GE = Green Energy MS = Mobility Services O = Other

A4 List of Enterprises

Company	Reference to Electromobility						
	DS	CH	SG	ICT	GE	MS	O
FAM Automobile	x						
FAURECIA	x						
METALIS	x						
ERNST DECOUPAGE EMBOUTISSAGE	x						
HAGER ELECTRO SAS		x					
PIM INDUSTRIE	x						
SCHLIGLER	x						
TRELLEBORG AIRAX	x						
Fonderie de la Bruche	x						
FUJI Autotech France	x						
Camelin Décollage Industries	x						
Streit Mécanique	x						
KNAUF Industries	x						
DIEHL AUGÉ Découpage	x						
JOHNSON CONTROLS ROTH	x						
TWOUP				x		x	
ALLRIM	x						
TRW CARR France	x						

(*) DS = Drive Systems CH = Charging SG = Smart Grids ICT = Information- & Communication Technologies GE = Green Energy MS = Mobility Services O = Other

Company	Reference to Electromobility						
	DS	CH	SG	ICT	GE	MS	O
PARKEON		x				x	
METATHERM Vermondans	x						
COOLTECH APPLICATIONS	x						
SCHRADER SA	x						
DANGEL Automobiles	x						
SOFANOUE Groupe DELFINGEN	x						
R BOURGEOIS	x				x		
PLASTIGRAY SA	x						
GROUPE SIMONIN	x						
MAGNA STEYR France	x						
L&L Products	x						
WEB GEO SERVICES				x		x	
FABI Automobile	x						
TIMKEN France	x						
BEHR FRANCE	x						
SCHAEFFLER	x						
LISI Automotive	x						
DELPHI MECHATRONIC SYSTEMS	x						
PSA PEUGEOT CITROEN	x						
EUROCADE	x						

(*) DS = Drive Systems CH = Charging SG = Smart Grids ICT = Information- & Communication Technologies GE = Green Energy MS = Mobility Services O = Other

Company	Reference to Electromobility						
	DS	CH	SG	ICT	GE	MS	O
CURVE DESIGN	x						
CLEMESSY	x						
AXESSIM				x			
MAHYTEC					x		
MAIA RDTG	x						
SHARE AND MOVE				x		x	
AMSTUTZ LEVIN VOESTALPINE	x						
YGGVAL				x			
AUTO CABLE	x						
GDF SUEZ					x	x	
GROUPE LA POSTE						x	
NORBA ENERGIES					x		
PHENIX INTERNATIONAL	x						
SEGULA	x						
SEW USOCOME	x						
A RAYMOND	x						
ACELTIS				x			
ALSTOM TRANSPORT	x						
APRR						x	
BMW FRANCE							

(*) DS = Drive Systems CH = Charging SG = Smart Grids ICT = Information- & Communication Technologies GE = Green Energy MS = Mobility Services O = Other

Company	Reference to Electromobility						
	DS	CH	SG	ICT	GE	MS	O
CITIWAY				X		X	
CONDUCTIX WAMPFLER		X					
ESM ETUDE STATIONNEMENT MANAGER		X		X		X	
EVE SYSTEM	X						
GM STRASBOURG	X						
HLP SERVICES				X			
IDEALEC	X			X			
INNOVTECHNIC	X			X			
LOHR INDUSTRIE	X						
MOBILIBRE						X	
MOBIVIA GROUPE						X	
MOVECOACH TECHNOLOGIES						X	
NOVAE ENERGIES					X		
PRORENTSOFT				X		X	
TDC SOFTWARE	X			X			
THURMELEC	X						
VEOLIA TRANSPORT						X	
VIX TECHNOLOGY				X		X	
WÜRTH ELEKTRONIK FRANCE	X			X			
SAFRAN ENGINEERING SERVICES	X						

(*) DS = Drive Systems CH = Charging SG = Smart Grids ICT = Information- & Communication Technologies GE = Green Energy MS = Mobility Services O = Other

Company	Reference to Electromobility						
	DS	CH	SG	ICT	GE	MS	O
GESTAMP SAS	x						
IPM France		x					
DBK France	x						
EAK Composants pour l'automobile	x						
CHAVET SA	x						
CARPENTER SAS	x						
GROSPERRIN	x						
STOCKO Contact	x						
SOMICA	x						
ZENITH PRECISION	x						
CTS	x						
GUYOT DECOUP	x						
GUYOT JACQUAND	x						
THOMAS SA	x						
DFI (DELLE FONDERIE INDUSTRIELLE)	x						
ASTEEL TECHNOLOGIES	x						
ACEAN	x						
JEANTET Elastomeres	x						
EFFBE France	x						
UHTEC	x						

(*) DS = Drive Systems CH = Charging SG = Smart Grids ICT = Information- & Communication Technologies GE = Green Energy MS = Mobility Services O = Other

Company	Reference to Electromobility						
	DS	CH	SG	ICT	GE	MS	O
GENERAL MOTORS POWERTRAIN	x						
PLASTIVAL SA	x						
GRAND-PERRET	x						
CML INNOVATIVE TECHNOLOGIES	x						
ASSYSTEM France	x						
DOLLFUS & MULLER	x						
EMAIREL	x						
SONY France				x			
BERROD SA	x						
Etablissements Dole SARL	x						
CELLUTEC	x						
SOPIL SA	x						
MARK IV SYSTEMES MOTEURS SA	x						
ORANGE LAB				x			
HIRTZ MIROITERIE INDUSTRIELLE	x						
SOLLAC	x						
BOURBON TECHNOLOGIE	x						
CLARIANT	x						
SOPREC INTERPLEX					x		
SICTA SARL GROUPE CITELE	x						

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Company	Reference to Electromobility						
	DS	CH	SG	ICT	GE	MS	O
Mahle Pistons de Colmar SARL	x						
INODIP	x						
BUGATTI Automobiles	x						
GTEC	x						
LANXESS	x						
STYRIA RESSORTS	x						
Mécanique et Environnement	x						
PMPC	x						
PLASTIC OMNIUM Auto Extérieur	x						
MILLET MARIUS SA	x						
CG TEC	x						
ITT CANNON				x			
AUTO'TREMENT						x	
BECKER ELECTRONIQUE				x			
FRESHMILE						x	
SMARTESTING LEIRIOS TECHNOLOGIES	x			x			
VIVERIS				x			
TRINAPS				x			
ARMADEUS SYSTEMS				x			
ELSASSCOM				x			

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Company	Reference to Electromobility						
	DS	CH	SG	ICT	GE	MS	O
GEOS Technology				x			
IDELOGIC				x			
EDF GROUPE		x	x		x	x	
NOVELTÉ SYSTEME	x						
PERINFO				x			
SOLVAY					x		
STAR-APIC				x			
SWING MOBILITY				x			
SCHROFF		x					
SAABRE		x		x			
SEQUANIE Energie					x		

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