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**Development of electromobility in France:
Causes, facts and figures**

Marie Castelli¹, Joseph Beretta²

¹*General Secretary, Avere-France, 112 quarter rue Marcadet 75018 Paris, France*

²*President, Avere-France, 112 quarter rue Marcadet 75018 Paris, France*

Summary

With more than 65 000 electric vehicles on the road, France is one of the most dynamic markets in the world. The paper aims at explaining how French authorities and industry managed to develop electric mobility in the country and to review the growth of electric vehicle uses. The paper will make a specific focus on the evolution of charging infrastructures networks and public subsidies.

Key words: France, market, policy, subsidy, state government

Introduction

1.1. Avere-France: the national association for the development of electromobility

Avere-France is a professional association founded in 1978. It is a member of the AVERE European network. As a centre of information and expertise, it gathers and represents more than 140 entities, such as vehicle and equipment manufacturers, research centres, consultancies, municipalities, urban mobility services or professional users of electric vehicles.

Its main objective is to promote the use of battery, plug in hybrid and fuel cell electric vehicles - individually and in fleets and for priority uses – in order to achieve greener mobility for cities and countries.

The main activities to achieve these objectives are related to lobbying, communication, networking, monitoring, and participation in French sustainable transports policy making.

Its main activities are:

- Communication and promotion of electric mobility
- Lobbying towards national and local public authorities
- Creation of synergies in the French electromobility sector
- Workshops and meetings on specific topics (such as subsidies on vehicles, interoperability, access to private and public charging points, batteries improvement...)
- Cooperate with AVERE
- Organize and implement actions to promote its members

Thanks to its expertise, Avere-France has been a strong partner of French policy makers for years. For example it has worked on the energy transition law and is involved in the transposition of the European directive on alternative fuels in the country.

1.2. The situation in France

Since 2009, and the *Grenelle de l'Environnement*, the growth of electric mobility has been a priority for French authorities. Indeed, the benefits of electric vehicles, from both an environmental and economic point of view, made it a political urgency.

Six years later, the effects of the political momentum are obvious in the country:

- A true sector has emerged, creating jobs and economic growth. A major French car manufacturer, Renault, is deeply involved and dominates the market. Many French companies invested in the industry (as charging infrastructure developers or car components makers, electricity suppliers or services providers);
- The market is highly dynamic (+48 % in 2015);
- Local and national authorities are involved in supporting the market (subsidies, local advantages);
- A strong charging infrastructures network is being built.

What are the causes and mechanisms of such a success and what is the situation in France in 2016?

Through a return on the origins of the French involvement in the growth of electromobility, we will demonstrate how public support has been, and is still, vital of it to develop and what are the consequences in the country.

2. An essential political impulse

2.1. The choose of electromobility

In September and December 2007, a series of meeting gathering companies, associations and policy makers has been organized by the French ministry of ecology to deal with the issues of protection of biodiversity, global warming and pollution. Named *Le Grenelle de l'Environnement*, this operation led to the building of a true policy on sustainable transports.

In this context, electric cars appeared as one of the solutions to ensure a sustainable development for the transport industry together with low carbon emission generating systems.

Indeed, the role of transportation in CO₂ emissions and deterioration of air quality in French cities was pointed out by NGOs and experts and electric vehicles appeared as a viable solution. Moreover, France is a great nuclear electricity producer and electromobility appeared as a way to improve the national trade balance, highly impacted by the importations of hydrocarbon fuels.

As a consequence, the ministry of environment decided to promote the growth of an electric vehicle market by acting on different leverages such as research and development, offer and demand.

Since then, the French authorities, no matter their political colour, have continued building policies in favour of the growth of electromobility. Besides, European regulations have been drawn up, calling on Member States to take measures to promote research, standardization, and improvements in the electricity networks and others promoting the necessary conditions for the existence of a broad market of electric cars.

2.2. National and local policies

Since 2007, a series of national and local policies were implemented in France to accelerate the development of electromobility. Two main obstacles have been identified and are target by national and local legislation: the higher cost of electric and hybrid vehicles and the need of a dense charging infrastructures network.

2.2.1. The ecologic bonus/malus: lowering the price of EVs

In 2008, a first measure is taken in the Finance Law to orientate car buyers towards cleaner vehicles: the *Ecologic bonus/malus* system. Still in place in 2016, this system offers subsidies for the purchase of a clean vehicle while financing it by taxing polluting ones. Electric and hybrid vehicles receive the higher bonus, which is a way to address the question of its expensive price. This measure has had a strong impact on the growth of the market and is considered vital by professionals of the sector.

Bonus / Malus	CO ₂ emission level (g/km)									
	2008 / 2009	2010	2011	January 2012 July 2012	August 2012 August 2013	August 2013 October 2013	November 2013 December 2014	2014	2015	
Bonus	7 000 €				x ≤ 20					
	6 300 €						0 < x ≤ 20			

5 000 €	$x \leq 60$		$x \leq 50$	$x \leq 50$	
4 500 €				$x \leq 60$	
4 000 €					$20 < x \leq 60$
3 500 €			$x \leq 60$		
1 000 €	$x \leq 100$	$x \leq 95$			
800 €			$x \leq 90$		
700 €	$x \leq 120$				
550 €				$x \leq 90$	
400 €		$x \leq 115$	$x \leq 110$	$x \leq 90$	
200 €	$x \leq 130$			$x \leq 105$	
150 €					$x \leq 90$
100 €		$x \leq 125$		$x \leq 105$	

In addition, the entering into force of the “superbonus” on the 1st of April 2015 has increased the demand on electric and hybrid vehicles while accelerating the renewal of the French automotive park. Indeed, it adds from 2500€ to 3700€ to the bonus if private consumers and legal entities (companies, local administrations, government administrations) scrap a diesel car registered before 2006.

2.2.2. Improving EVs and charging infrastructures costs through the taxation system

- **Taxation system on company cars**

Besides the ecologic bonus/malus system, national French authorities have acted on the taxation system to improve the total cost of ownership (TCO) of EVs. Being the main purchasers of new vehicles, and consequently able to stimulate the market, companies fleets are particularly targeted.

The taxation system on company cars is built to orientate fleet managers towards cleaner vehicles:

CO2 emissions (g/km)	Tax - €/g CO2	Annual amount
< 50	0	0 €
> 50 - < 100	2	From 100 to 200 €
> 100 - < 120	4	from 404 to 480 €

> 120 - <140	5.5	from 660 to 770 €
> 140 - < 160	11.5	from 1 610 to 1 840 €
> 160 - < 200	18	from 2 880 to 3 600 €
> 200 - < 250	21.5	from 4 300 to 5 375 €
> 250	27	from 6 750 €

Despite this kind of measure, the TCO for electric and plug in hybrid vehicles is still hardly favourable. Under 12 000 km travelled per year, having a clean vehicle is more expensive for companies, which remains a strong obstacle for a broader development of the market in France.

- **Tax credit on private charging infrastructures**

Since 2014, a 30% tax credit is available for private people purchasing a charging point at home. This measure aims at overcoming the obstacle of investment in this mandatory infrastructure, which increases the total cost of acquisition of an electric or plug in vehicle for many people.

- **Local taxes**

With the same spirit, most French regions have decided to lower the price of car registration documents. Indeed, around 50 % of these local authorities offer it freely for electric cars and the other ones offered a 50% discount.

2.2.3. Developing public and private charging points

The energy transition and green growth law, voted in 2015, has an objective to have 7 million public or private charging points installed in France by 2030.

- **Investment on public networks**

In order to enable a real development of electromobility in the country, France has decided to invest in an accessible charging point network providing security and secondary charging solutions to EV drivers. The responsibility of building these networks have been given to local authorities of every level through national subsidies from *the future investment program funds*.

A total budget of 50 million euros in subsidies is allocated to these operations.

- Subsidy up to 50% of total cost investment for a normal charging infrastructure (3,7 to 22 kW).
- Subsidy up to 30% of the cost of investment of quick charge infrastructure.

At the end of 2015, 75 plans have been validated, for a total of 20 403 charging points, which represent an average of one charging point for 1 700 inhabitants of all the covered territories.

Since 2010, the public charging offer has significantly increased. While in July 2012, there were 1800 charging points, nowadays, there are 11 280 charging points functioning.

Moreover, a law voted on the 4th of august 2014 allowed private operators to install charging points networks in the public space of a city council without having to pay a tax for occupying public space when this belongs to a national project. The French government has chosen three projects, the first led by BOLLORE COMPANY, the second by Compagnie Nationale du Rhône, and the third by SODETREL.

As a result, a network of more than 38 000 charging points will be accessible to the public in France by 2020.



Departmental networks
13991 charging points

Regional networks
7 033 charging points

National networks
17 094 charging points

Source : GIREVE

To complete this financing program, the French government has also developed a guide to support local authorities to implement charging infrastructure projects in public areas. It is built around three thematic axes: a technical, an economic and a legal one, and establishes the state financial support framework. This guide was published in April 2011 and reviewed in December 2014 to reflect the technological, economic and regulatory evolution of low-carbon vehicles and charging infrastructure, and the feedback gathered.

- **Financing private charging stations**

In addition to the development of public charging points, France recently decided to give subsidies for private ones through the *certificate of energy saving* mechanism. Avere-France has been put in charge of this 15 millions euros program and will deliver subsidies:

- Up to 50% of total cost investment for a normal charging infrastructure in collective housing buildings (individual or shared charging point).
- Up to 40% of total cost investment for a normal or fast charging infrastructure in companies parking spaces buildings (fleet, salaries or visitors charging points).

More than 12 000 private charging points should be installed by mid-2018 thanks to this program.

- **Easing new equipment in buildings**

In order to ease charging points integration in new buildings, a law voted in 2010 created an obligation for land developers to prepare car parks and buildings in construction for a future equipment. Protective sleeves and cables paths have to be integrated in every new construction (offices and homes). By 2017, this framework will be extended to industrial buildings, administration buildings and third parties.

Besides, a “right to the plug” is in place since October 2014 for people living in old condominiums buildings.

2.2.4. Developing facility of use

A lot of big cities give facility of use to electric vehicles in order to encourage people and companies to choose them. For example, Paris offers free parking to electric and plug in cars, which is a strong incentive since parking is 9€/hour for thermic cars!

To enable local authorities to develop incentives to purchase clean vehicles, the government has a project of launching a system of identification car stickers also known as air quality stickers. As a consequence, users of less polluting cars will be able to benefit from local traffic advantages such as:

- Access to restricted circulation areas
- Favourable traffic areas.
- Privileged driving conditions.

2.2.5. Development of low emission cars among public fleets

Since 2012, administration and local authorities are strongly advised by the government to buy at least 25% of clean cars, defined as electric and hybrid, when they purchase new vehicles.

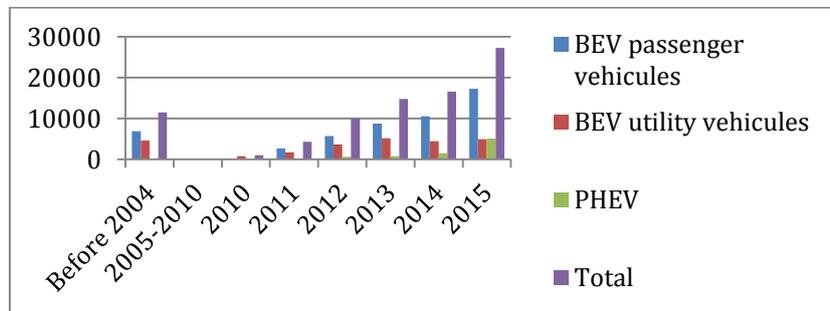
The energy transition law, voted in 2015, has strengthened this measure by creating an obligation of buying 50% of low gas emission vehicles (defined in the law as electric cars or engine cars with low emissions of and CO2 and pollutants, whose levels will be regulated by a government decree) when there is a fleet renewal for the government, local authorities and associations, national companies, renting companies and taxis.

3. Consequences: Market and uses in 2016

3.1. The success of the EVs market in France

3.1.1. A dynamic market

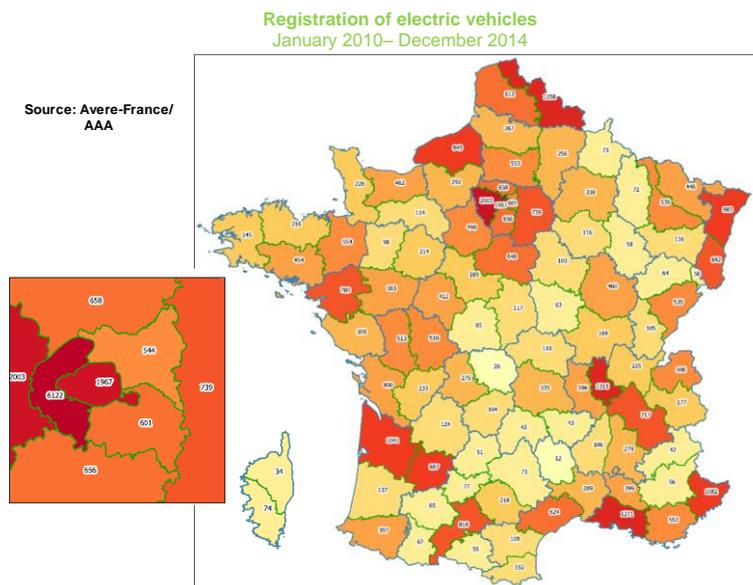
The effects of the public incentives on the prices of electric cars and charging infrastructures are notable since 2010. Indeed, even if the volumes are still too little to enable the sector to live without subsidies, the market is constantly growing at an impressive rhythm. With 22 187 100% electric vehicles registered in 2015, France is the second European market after Norway (26 757).



Source : Avere-France/AAA

3.1.2. Local disparities

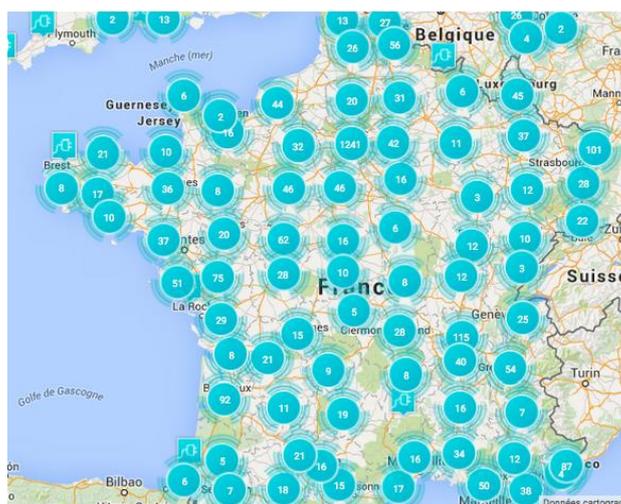
In spite of this dynamism, there are still strong local disparities. Most of them can be explained by gaps on the local incentives and charging infrastructures level.



3.2. A strong public charging infrastructures network

3.2.1. Network in March 2016 :

Nowadays, there are around 11 280 charging points accessible to the public for around 75 000 electric cars in France. The whole territory is covered:



Source : <http://www.renault.fr/gamme-renault/vehicules-electriques/zoe/zoe/toutes-les-bornes-de-recharge.jsp>

3.2.2. Actors

These public points are owned by a variety of private and public actors:

Actors	Nb of charging points – October 2015
Car sharing (accessible to other vehicles)	5010
Shopping centre	308
CNR	21
Local territories	1376
Companies	307
Car dealership	1289
Gas stations	10
Shopping malls	849
Hotels/Restaurants	38
Parking spaces	830
Tesla superchargers	123

Total	10161
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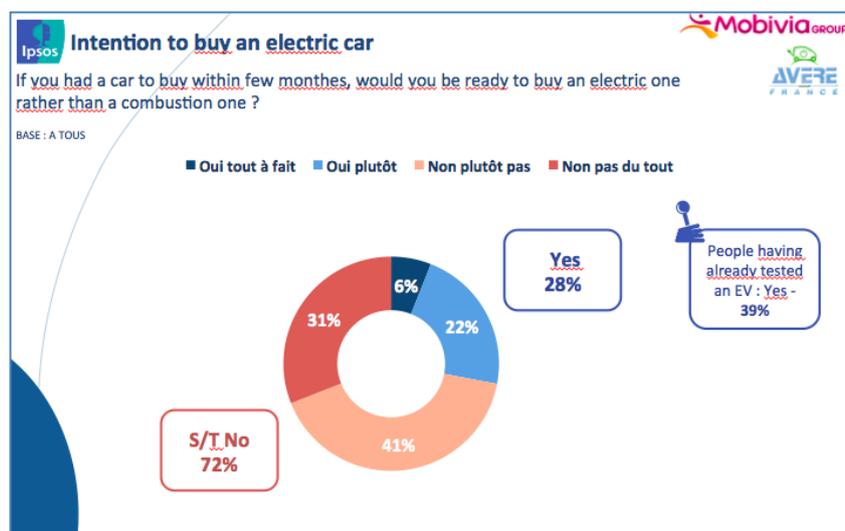
Source: GIREVE

4. Conclusions

Thanks to the involvement of national and local policy makers, the growth of electromobility in France can be considered a success. More than only developing the market, this political support is a way to multiply the visibility of electric cars in the French streets. And this visibility has effect on the “electromobility” of French people.

4.1. French people and electric vehicles: a predictable success

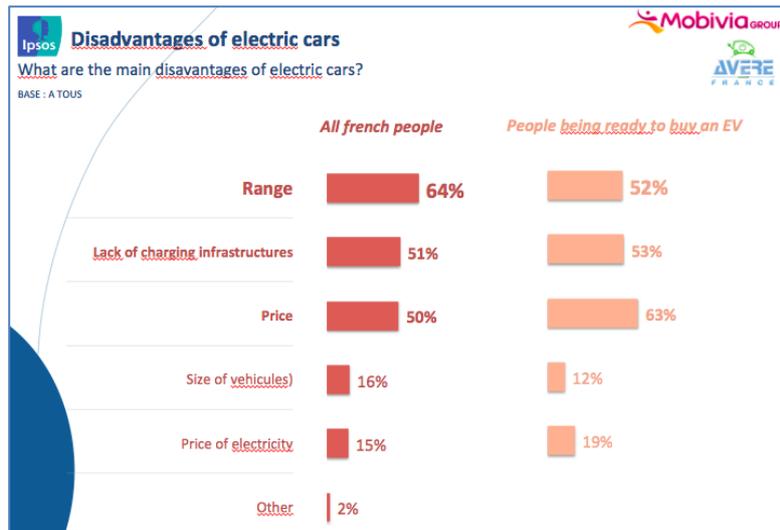
In September 2014, Avere-France, Mobivia group and IPSOS conducted a survey on the perception of electric vehicles by French people. The conclusions are relevant: 28% of French people are ready to buy an electric vehicle! And it is even more when people have already tested an EV.



4.2. Challenges

However, the French success has to be balanced. Indeed, even if France is one of the most dynamic markets in the world, the EVs market shares are only 1% of the whole automobile market when PHEV are only 0,4%, which makes France the 4th European market in terms of penetration after Norway, Denmark and Switzerland.

Strong obstacles remain for electromobility to grow massively. Indeed, there are still strong myths on electric vehicles and, in spite of the existing subsidies and the development of charging infrastructures network, price and range are still considered to be obstacles by most of the people.



In conclusion, public support can be considered as vital for the growth of electromobility in France. But it is not enough. A strong effort on pedagogy and information is still needed in order to fight popular beliefs.

5. Authors



Marie Castelli, 31 years old, is the General Secretary of Avere-France since 2013. She is considered as one of the French electromobility sector experts in France. Before that, she was a consultant in a public affairs consultancy where she was specialised in energy issues.



Joseph Beretta, 62 years old, is the president of Avere-France since 2012 and vice president of AVERE since 2014. After 40 years spent in the electric and car industry, and 3 years working for the French ministry of Research, he is one of the world's experts of electric vehicles, both on a technical, industrial and political point of view.