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How carsharing opens the way to smart electric mobility: success & hurdles of the largest electric carsharing fleet in Canada.

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Short Abstract Summary

Communauto is the oldest North American carsharing company and the largest in Canada. It was one of the first organisations of its kind to take the path of electrifying its fleet. In Montreal, Communauto offers the largest electric carsharing in Canada: 65 EVs out of the 1800 vehicle fleet are available in station or in one-way free floating to more than 40 000 members. The experience gained during these years about managing an electric fleet in winter conditions; as well of typical patterns of usage, will be presented. Thanks to this service, thousands of citizens gained access to electric mobility, despite the “hostile”, not quite adapted to electric vehicles urban environment.

Communauto is only at the beginning of a process that will lead the organisation to put in place a larger project, reaching 1000 EVs in 5 years, as targeted by the City of Montreal. The presentation illustrates the business plan that can bring this offer to be economically viable, how the different operation challenges are addressed and the large impact that this system will produce on urban environment and electric mobility acceptance.

Keywords: Car-sharing, consumers, EV (electric vehicle), public transport, promotion, marketing, Canada , smart, data acquisition, environment, municipal government, sustainability, vehicle performance

1 How Communauto car sharing fleet contributed to the promotion and accessibility of electric technology in Montreal.

1.1 Carsharing eases the access to electric vehicles

In 2011, there were no 100% electric cars driving at regular speed commercially available in Canada and very few charging stations where publicly available. The first electric vehicles of this kind commercially available, 25 Nissan Leaf, were acquired by Communauto. As part of this feat, the company had to build up its own charging stations network. Nevertheless, a year later, more than 30 000 Quebecers had access to an electric vehicle for as little as 40\$ per year, thanks to Communauto. Since then, more than 55 000 trips have been made

for almost 1 000 000 km. In order to achieve these results only a limited public investment was needed in terms of incentives for vehicle purchase and charging infrastructure compared to the number of persons addressed. Communauto's EV carsharing model has not only revolutionized consumer choices in the mobility market but has also contributed to the democratization of its access.

Communauto system is able to demonstrate multiple real benefit of an electric carsharing system. Its model reduces the number of kilometers driven and consequently, greenhouse gas emissions are avoided. The benefits of EVs in a carsharing fleet have a longer life span. Only for the electric motorization they can be calculated to 300 tons of CO₂. It is also well documented that a Communauto car replaces 10 private cars. (Nouri et al.2013) responding to the known criticism that a "congestion of electric vehicles is still congestion".

In reducing the number and use of vehicles, making electric mobility accessible at the lowest price for a larger amount of citizens and making it more socially acceptable, Communauto has shown that electric carsharing has a future.

This conference will also show how such model is promising for public transportation integration.

1.2 Tests and results about consumer behaviour, charging stations and network technical needs

Communauto's fleet is an extraordinary test field to validate assumption about the attitude towards electric vehicles, charging operations and infrastructure technology. This allowed us to test in "real life" the 3 different power levels of charging infrastructure currently available; to determine the tipping point in the choice of an electric car depending on the number of kilometers driven, to observe the occupation rate of a carsharing fleet on a public charging network, and of course, the charging algorithm in winter climate.

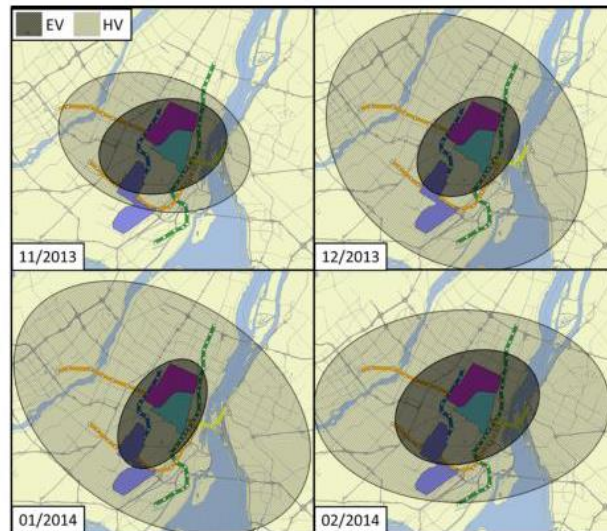


Figure 1: Standard Deviation Ellipse of Auto-Mobile user's activities by EV and HV (scale 1 :100 000)

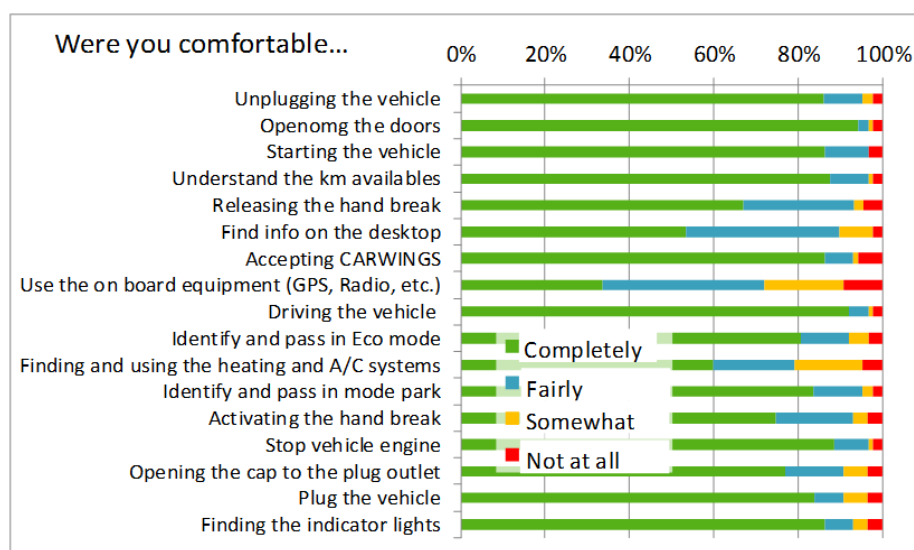


Figure 2: Customers level of comfort with EV's driving experience (Communauto, 2012)

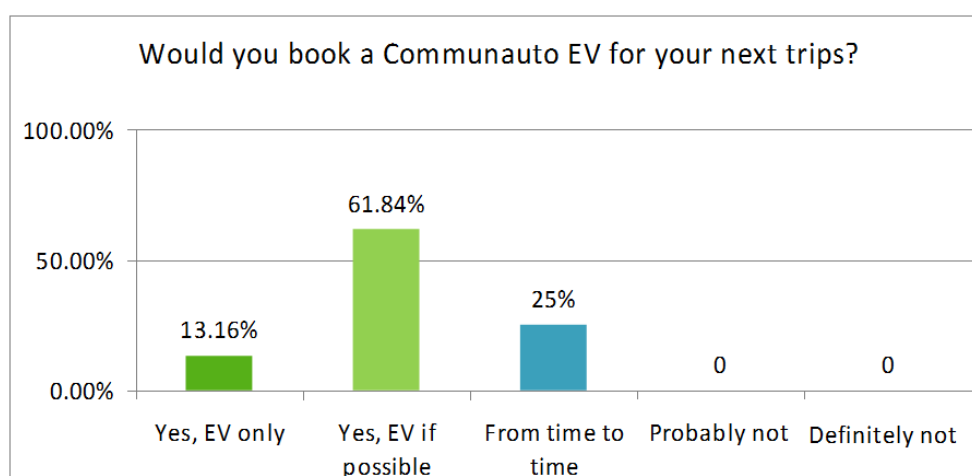


Figure 3: Attractiveness of EV's for carsharing users (Communauto, 2012)

2 A bigger development for the next five years: challenges to face and solutions

Despite the fact the actual Communauto EV fleet is the largest offer of this kind available in Canada; it is only a first step in providing part or all of the service required by the City of Montreal within the next five years. The City has set a target goal of a 1000 EVs carsharing system that will connect on a charging network also compatible and open to private vehicle owners. Communauto is proposing a business plan in order to provide this service in a viable and sustainable way. This will insure Montrealers have access to electric mobility.

The presentation will describe the major assumption of this business plan as well as the operational mode to put in place to make this offer available in the most effective way.



Figure 3: How Communauto free floating carsharing system works

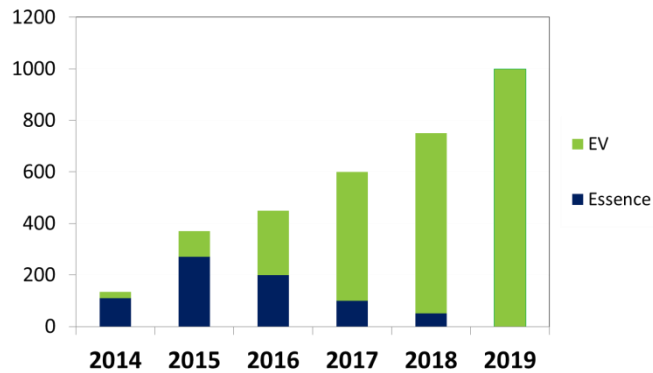


Figure 4: Communauto Business model: Integration and transition to 100 % EVs

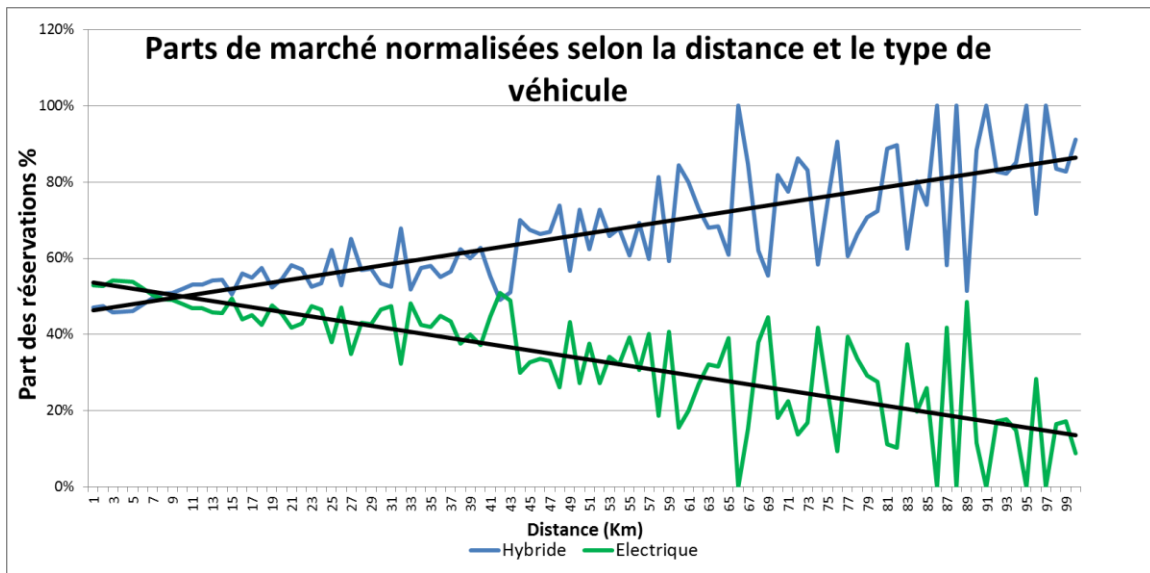


Figure 5: Tipping point in the choice of motorization depending on the number of kilometers driven

Conclusions

After few years of implementation, the model has gained in maturity and in popularity. Data are showing that Communauto self-Service EV carsharing model have succeeded in making more accessible EV technology to the population. With this kind of approach, Communauto can affirm it have helped demystify electric mobility with an inclusive commercial approach and a solution that is easily replicable.

Other type of information that will be provided within the presentation

- Impact of electrification on supply and demand
- Operational costs and hurdles of an EV's fleet in a Northern country
- Government incentives and policies: impact on costs and operational issues
- Issues, challenges, attractiveness, Zero Emission specific to the Canadian context

Authors



Marco Viviani is the development and public relations director of Communauto, the oldest car sharing organization in North America and one of the most important services of this kind in the world. After his studies in Physics at the University of Milan, he was responsible for the activities about energy policies in the Milan office of the WWF – World Wide Fund For Nature – (1990-1997) and later he had the functions of vice-president of the Italian environmental research institute, Eco-institute (1997-2004). With these roles, he led or participated in several national or European studies to introduce car sharing and mobility management practices.

Since 2003 he lives in Quebec, where he is an attentive observer of the development of politics in the field of transportation and environment.