EVS24
Stavanger, Norway, May 13-16, 2009

Nissan puts zero-emission leadership at the center of its product strategy

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Abstract

Nissan believes that CO_2-free vehicles are the ultimate solution for sustainable *mobility* in order to address widespread concerns about global warming and dependence on fossil combustibles. Therefore, Nissan is committed to mass-market an all-electric vehicle starting in the USA and Japan in 2010, in Europe a year after and globally by 2012.

Just talking about electric cars on television or only leasing a few of them in specific territories is not mass marketing. Today Nissan and its partners are taking commitments to ensure that this global project remains on track, despite the adverse economical environment.

From a technology standpoint, Nissan's advanced compact *lithium-ion battery* is at the forefront of the global automotive industry either in terms of density or from a packaging point of view.

From a marketing standpoint, Renault-Nissan Alliance is forming innovative partnerships with governments, regions, cities, utility companies and other organizations in order to start educating potential customers and prepare the necessary infrastructure to make the deployment of EVs worldwide a commercial success. 11 partnership agreements have been signed in Europe as of today (April 2009) making a total of 21 agreements globally.

To become a leader in *zero-emission vehicles*, Nissan aims at working closely with governments and other parties to plan the *infrastructure*, to shape public *policies*, to build networks of EV charging stations and to help define the incentives or tax credits which can put this new technology within the reach of car buyers.

1 Introduction

To address widespread concerns about global warming and dependence on oil, Nissan invests in a wide portfolio of green technologies, including improved internal combustion engines (e.g. new downsized generation of engines, clean diesels), hybrids and fuel cells vehicles.

But the centrepiece of our product strategy for the next years will be a zero-emission all-electric car.

Nissan firmly believes that the ultimate solution for sustainable mobility is Zero-emission vehicles.

Nissan has made a strategic commitment to lead

the automobile industry in mass-marketing zero-emission vehicles together with our Alliance partner Renault.
Neutrality to the environment – Zero CO_2, zero particles - meaning transportation without guilt, this is the territory we want to own.

2 The key of EV mass-marketing

And we are taking all the initiatives necessary to make it happen. We are currently developing a range of high-quality pure electric vehicles.
The first of them will be introduced in the United States and Japan in 2010, from 2011 in Europe and mass-marketed globally in 2012. It will have its own and distinctive unique design. It will be based on an all-new dedicated platform in order to benefit from the ultra efficient package of AESC batteries (joint venture established by Nissan and NEC Tokin).
The first car will be a compact family car, with room for five and their luggage; it will be roomy, safe, attractive, and fun to drive.
The customer will not have to sacrifice the driving experience compared to ICE cars besides the range. He, or she, will be able to drive 100 miles (~160 kilometres) on a single charge. The battery will be recharged overnight on standard plugs. In case of need, it will be possible to achieve 80% of the charge in 20mn at high voltage "Quick Charging" stations.
This new car will obviously be 99% recyclable.
And there won't be only one car, together with our partner Renault we are already working on a full range of electric vehicles including commercial vehicles, city cars, etc.

3 The battery, heart of EV

Our vehicle will be powered by advanced, compact lithium-ion batteries manufactured by Automotive Energy Supply Corporation (AESC), the joint venture that Nissan formed with NEC Tokin in 2007, with a major investment of 80 million €.
Nissan now "owns" the technology and controls the value-chain of the battery development from raw material to the Lithium Battery Pack ready for use.
Mass production of the batteries starts in 2009, with a planned production of 13,000 units in the start-up period. The facility will eventually have a production capacity of 65,000 units per year.

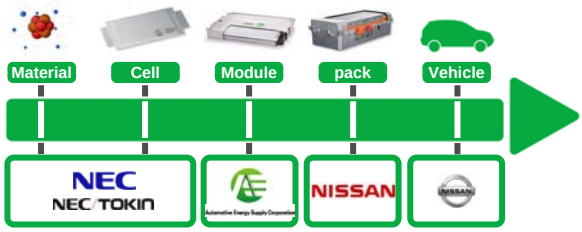

Figure 1: Controlling the value-chain of the battery development

We believe that our battery will offer best performance, reliability, safety and cost competitiveness. It will get an 80% recharge in around 20 minutes with a high-voltage source; it will also be able to get a full charge in six to eight hours using any domestic power supply.
Nissan has been conducting research and experiments on lithium-ion batteries since 1992. The world's first application of lithium-ion batteries was in 1996 in the Prairie and the Altra EV (Japan and the USA), followed by the ultra-compact Hypermini in 2000. Travellers to Japan may actually still see some of them being used on public roads.
Thanks to those fleets, Nissan was capable to validate the performance of the batteries based on real-world experience.

4 Beyond the Electric Vehicle, a holistic approach of the market

Nissan strategy is unique because it goes beyond the product itself. There is interdependence among the automaker, governments and/or third parties in order to build a greener transportation system.
Designing and building the electric cars is only part of the EV revolution. Before electric vehicles find mass acceptance, a comprehensive recharging network needs to be installed in most major towns and cities.
Incentives, tax exemptions or benefits in kind will also play a major role in helping to jumpstart the mass market.
Utilities will have to be involved in order to supply electricity and to prepare charging infrastructure, as well as to develop renewable energy sources.
Therefore, Nissan's approach is to form innovative partnerships with governments, cities, regions, utilities and other stakeholders. Together we will advance the deployment of electric vehicles worldwide.
In March 2009, Nissan (together with its Alliance partner Renault) announced the signature of a final agreement together with the Government of Monaco as well as the Irish authorities, to promote

the use of Electric Vehicles in their respective countries.
The Alliance Renault-Nissan has already signed numerous agreements with countries and companies around the world, and there are many more to come.

- Portugal government
- The Principality of Monaco
- Israel (with Project Better Place)
- Denmark (with Project Better Place)
- Ireland (with Irish governmental utility company)
- EDF, major French utility company
- ALPIQ, Swiss energy company
- Green Tomato, UK low emission taxi firm
- Elektromotive, UK-based specialist in EV infrastructure
- Ewz, electricity company of the City of Zurich
- One North East (North East region's authority, UK)
- LeasePlan, European market leader in fleet and vehicle management
- State of Tennessee, USA
- State of Oregon, USA
- Sonoma County in Northern California, USA
- Tucson Metro Area in Arizona, USA
- Phoenix metropolitan region in Arizona, USA
- San Diego Gas & Electric (SDG&E), the Californian utility company
- City of Yokohama, Japan
- Prefecture of Kanagawa, Japan
- Ministry of Industry and Information Technology of China (MIIT).

5 Making EV available for all motorists

Local, state and federal governments will support the infrastructure set-up, promote awareness and public education. They will also use electric vehicles as part of their own fleets. They will adapt legislation and tax regimes, or offer other types of incentives, such as parking or toll rebates for electric car buyers.
In the end, rather than paying a premium for a zero-emission car, buyers of Nissan's electric cars can expect their operating costs to be equal or lower, than those of a similar-sized conventional car.

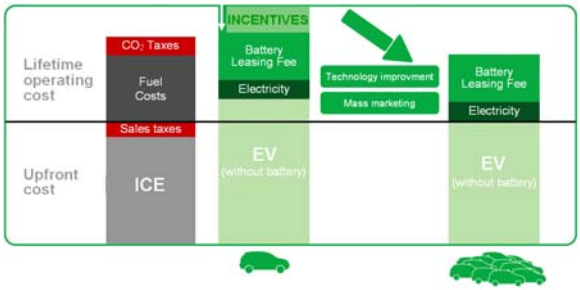

Figure 2: Decreasing cost of ownership

Customers will enjoy the ultra low cost of "filling" their car compared to that of a full tank of petrol.
They will also find a reassuring infrastructure to charge their car, whenever they cannot recharge it overnight at home.

6 Conclusion

The transition from gasoline- to electricity-powered cars requires a transformation in the way customers buy and use their cars. Nissan considers that, in order to accompany such a shift in behaviour, and beyond imagining and manufacturing electric cars, it needs to partner with other stakeholders to prepare the mandatory conditions for success. This project is at the core of Nissan's Product Strategy for the years to come. The company is totally committed to dedicate the necessary internal resources to claim the Zero Emission leadership and be the first to mass market Zero Emission vehicles globally by 2012.

Authors

After 12 years with Renault, Pierre Loing joined Nissan in 1999 in Japan, following the Alliance. He was appointed Vice President of Product Strategy & Planning for Nissan Europe in 2006. Under this role, P.Loing is responsible for the full line-up for Nissan and Infiniti brands. He has been overlooking major European successes such as Qashqai, and soon Nissan EV.
P.Loing holds an MBA from ESC Rouen (France) and completed the Executive Development Program at INSEAD.