Renault-Nissan

ELECTRO-MOBILITY AND THE ELECTRICITY SECTOR: CHALLENGES AND SOLUTIONS
1. Electric vehicles - At the heart of the automotive transformation
ENERGY & ENVIRONMENTAL CHALLENGES

Resources
Reduce oil dependency

City & Health
“Airpocalypse”

Climate
Limiting warming < 2°C

1. Electric vehicles – At the heart of the automotive transformation
TRANSPORT & SOCIETAL CHALLENGES

1. Electric vehicles – At the heart of the automotive transformation

Mobility for all
Affordable mobility

Connectivity
Smart connections

Innovation
Connected and Automated Driving
1. Electric vehicles – At the heart of the automotive transformation

ANSWERING THE CURRENT AUTOMOTIVE TRANSFORMATION WITH ELECTRIC VEHICLES

ENERGY & ENVIRONMENTAL CHALLENGES

- Resources
  Reduce oil dependency

- City & Health
  “Apocalypse”

- Climate
  Limiting warming < 2°C

TRANSPORT & SOCIETAL CHALLENGES

- Mobility for all
  Affordable mobility

- Connectivity
  Smart connections

- Innovation
  Connected and Automated Driving

Less noise, less stress

Low noise level
Zero emission

Des ventes justifiées par l'attractivité des produits...
2. Promoting EV Development - One ambition, Many challenges
PROMOTING EV DEVELOPMENT
One ambition – Many challenges

1. Bring the customers on board by
   ✓ Managing the range level
   ✓ Speeding up EV cost reduction: Alliance platform & Battery cost breakrough

2. Make the EV a volume reality by
   ✓ An integrated approach with all stakeholders
   ✓ A sufficient deployment of charging and filling infrastructure
   ✓ A good level of incentives for the roll-out of ZEVs and PHEVs (smart pricing, subsidies)
THE AMBITION: DEPLOYMENT OF EV

2. Promoting EV Development – One ambition, Many challenges

IT players | EV Start-ups | Industrials players
---|---|---
Alibaba Group | Faraday Future | SK
Baidu | etive | NEXTEV
LeEco | Siemens | BAIC Group
Tencent | Qiantu Qiche | BAIC Group
FOXCONN | Harmony Futeng (Future Mobility Corp) |
Google | Systems |
Partnership | Funding | Acquisition

2011

NOW
THE FACTS: LIMITED EV DEPLOYMENT

- 2017: 0.5% (WORLD), 0.8% (EUROPE / +42% VS 2016)
- 2020: 4% (WORLD)
- 2025: 9% (WORLD)

EXPECTATIONS

- INCREASING NUMBER OF OEM/MODELS:
  >50 GLOBAL BEV IN 2022
- COST TIPPING POINT VE vs ICE:
  2020-2025 DEPENDING ON SEGMENT & BATTERY SIZE
- ALL SEGMENT COVERED BY 2021

2. Promoting EV Development – One ambition, Many challenges
3. Challenges and solutions to Electric Vehicles deployment
3. Challenges and solutions to EV deployment

WHAT ARE THE SOLUTIONS?

Price / TCO

Enquete Satisfaction - 2015 G6

Autonomy

Charging Infrastructure

Equipments

Visibility

Autonomy

Infrastructure
3. Challenges and solutions to EV deployment

WHAT ARE THE SOLUTIONS?

Price / TCO

Autonomy

Infrastructure

Technology evolution

Public policies & Incentives

EV Ecosystem

Enquete Satisfaction - 2015 G6

Autonomy

Charging Infrastructure

Equipments

Visibility

Top 5 Zoe Dislikes

- Renault ZOE (2012)
- E-UP!
- BMW i3 EV
- VW Golf 7 (2013) EV
- EV's competitors
3.1. Technology evolution
Tomorrow, autonomy will not be a major issue anymore.

The charge operation will become:
- Easier
- Faster
- More accessible
# EV RANGE FORECAST

## 3.1. Technology evolution

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- **EV PREMIUM**
  - Volkswagen Budd.e (600km, 92kWh)
  - Tesla Model S P90D (550km, 90kWh)
  - Aston Martin RapidE (>500km)
  - Porsche Mission E (>500km)
- **EV MAINSTREAM**
  - Audi Q6 eTron (95kWh)
  - BMW 3 series i3 (150km, 75-90kWh)
  - Mercedes EV (500km)
  - Tesla X 90D (470km, 90kWh)
- **EV ACCESSIBLE**
  - Hyundai Ioniq (250km, 28kWh)
  - BYD e6 (400 km, 61kWh)
  - Tesla 3 (500km TBC)

**MARKET EXPANSION THROUGH TCO COMPETITIVENESS**

**JUST NECESSARY RANGE FOR DAILY USE,**

- **VW Budd.e (510km, 92kWh)**
- **Tesla Model S P90D (550km, 90kWh)**
- **Aston Martin RapidE (>500km)**
- **Porsche Mission E (>500km)**
- **Audi Q6 eTron (95kWh)**
- **BMW 3 series i3 (150km, 75-90kWh)**
- **Mercedes EV (500km)**
- **Tesla X 90D (470km, 90kWh)**
3.1. Technology evolution

ON-BOARD & OFF-BOARD CHARGE

AC Charging

Reversibility « V2G »

DC Charging

On-board charger

BMS

Li-ion battery

Off-board charger

DC Fast Charging Station
3.2. Public policies & incentives
3.2. Public Policies & Incentives

NEED FOR STRONG INCENTIVES SUPPORT

- **Investment in infrastructures**
- **Parking access**
- **Free parking**

- **Fiscal incentives**
- **Priority lanes**
- **No traffic restrictions**
3.3. Alliance Strategy - Building an Eco-system for Electric Vehicles
3.3. Alliance Strategy – Building an Eco-system for Electric Vehicles

AN ECOSYSTEM SPECIFIC TO ELECTRIC VEHICLES

Smartgrid

Mobility solutions

Charging

Lifecycle

B2B
3.3. Alliance Strategy – Building an Eco-system for Electric Vehicles

AN ECOSYSTEM SPECIFIC TO EV BASED ON PARTNERSHIPS
3.3. Alliance Strategy – Building an Eco-system for Electric Vehicles

AN ECOSYSTEM SPECIFIC TO ELECTRIC VEHICLES
DEVELOPPING NEW SERVICES FOCUSED ON CONSUMERS’ NEEDS

Renault Energy Services

3.3. Alliance Strategy – Building an Eco-system for Electric Vehicles

**FAST CHARGING**

E.g. E-STOR: Fast charging stations with second-life batteries from Renault's EV

**SMART CHARGING**

E.g. Pilot home charging to match electricity operators needs 25% stake in JEDLIX

E.g. Launch of Renault Z.E. Smart Charge Apps.

**SECTOR COUPLING**

Connect clean energy to grid and buildings
INITIATIVES TO ACCELERATE THE DEPLOYMENT OF CHARGING INFRASTRUCTURES

EV READY – CERTIFICATION LABEL, LEAD BY RENAULT
• Charging spots conformity, and their installation
• Third party certification ASEFA (LCIE BV)
• Includes Renault, PSA, Nissan, Mitsubishi + ad-hoc participation VW, DAI, Toyota, Ford...

GIREVE – THE RENAULT SOLUTION FOR INTEROPERABILITY
• SAS Renault, EDF, ENEDIS, Caisse des dépots, CNR created in 2013
• Insure services interoperability of EV charging in Europe
• Major PF interconnexion through Pan-European Initiative (2014)

E-VIA FLEX-E – PARTNERSHIP FOR FAST CHARGING STATIONS
• 14 Fast charging stations (between 150 kW and 350 kW) in Italy, France and Spain
• ENEL, Nissan, EDF, Enedis, Verbung and IBIL
3.3. Alliance Strategy – Building an Eco-system for Electric Vehicles

AN ECOSYSTEM SPECIFIC TO ELECTRIC VEHICLES

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Charging

Confrontations Conference
COP21: MOVING TO RENEWABLES

- Worldwide acceleration of RNW
- COP21: more than 50% contribution in Energy

A NEED FOR FLEXIBILITY IN RENEWABLES

- Cyclic and irregular consumption
- Intermittent and distributed RNW production
THE ELECTRIC VEHICLE, A KEY PLAYER OF SMART ENERGY

3.3. Alliance Strategy – Building an Eco-system for Electric Vehicles

Enabling Technologies towards Renewable Energies
THE ELECTRIC VEHICLE, A KEY PLAYER OF SMART ENERGY

Enabling Technologies towards Renewable Energies

Smartcharging:
EV, a controllable consumer! even an electricity producer!!

Energy Storage:
Second life EV batteries

3.3. Alliance Strategy – Building an Eco-system for Electric Vehicles
3.3. Alliance Strategy – Building an Eco-system for Electric Vehicles

SEVERAL SERVICES CAN BE PROVIDED BY EV

- To optimize energy consumption
- To optimize power
- To help network stability

Special features

- Islanding
- Véhicule Rescue V2V
- Fleet Management

- Price → €
- Quantity → kWh
- CO2, Green En.

Subscription
- Grid connection
- Peak Power

Frequency
- Voltage
- Quality
THE ELECTRIC VEHICLE, A KEY PLAYER OF SMART ENERGY

A huge potential in a 2025 market projection of several millions of vehicles

Alliance Renault/ Nissan today

400 000 Electric Vehicles sold by Renault / Nissan

11 gas plants (2300 wind turbines)

10 days of Paris public infrastructures consumption
3.3. Alliance Strategy – Building an Eco-system for Electric Vehicles

AN ECOSYSTEM SPECIFIC TO ELECTRIC VEHICLES

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Confrontations Conference
WHY USING SECOND LIFE BATTERIES?

- High safety level
- Technical performance
- Towards a mass market
- Affordable: << new battery price
3.3. Alliance Strategy – Building an Eco-system for Electric Vehicles

ELSA project

6 pilot sites to cover all important use cases for small and medium storage solutions
3.3. Alliance Strategy – Building an Eco-system for Electric Vehicles

AN ECOSYSTEM SPECIFIC TO ELECTRIC VEHICLES

Mobility solutions
DEVELOPPING NEW MOBILITY SOLUTIONS TO ANSWER TO CONSUMERS’ NEEDS

Engage in main cities car-sharing projects
E.g. 500 ZOE with Ferrovial in Madrid

Example: Carsharing

Engage in partnerships
E.g. Renault Mobility & IKEA: 300 vehicles, 100% electric

3.3. Alliance Strategy – Building an Eco-system for Electric Vehicles
THANK YOU