



Nissan Leaf Overview

March 2010

Zero Emission



HISTORY OF NISSAN'S EV



- 17 years of experience in lithium-ion battery/car application
- Late CY2010 launch all new pure electric vehicle



1998 Altra EV

2000 Hypermini

2008 Test Vehicle

2010 Leaf US, JPN

PIVO
2005 Tokyo MS

PIVO2
07 Tokyo MS

NUVU
2008 Paris MS



LOCALIZED PRODUCTION



EV battery plant groundbreaking in May 2010

- New battery production facility in Smyrna, Tenn.
- For both electric-drive vehicles and battery production
- We'll begin building zero-emission vehicles by the end of 2012



NISSAN LEAF



Highlights

- Zero Emission
- Affordable
- Stimulating acceleration
- Quietness
- 100-mile range sufficient for daily use
- Advanced intelligent transportation (IT) system



Size	5-door medium sized hatchback
Capacity	5 Adults
Range	100 miles (US LA4)
Top Speed	~90 mph
Battery	Laminated Li-ion (Manufactured by AESC)
Capacity	24 kWh/over 90kW
Motor	High-response synchronous AC Motor 80kW/280Nm
IT System	Integrated communication system

Zero Emission



MAKING ZERO-EMISSIONS AFFORDABLE



LEAF will be leased or sold **with its lithium-ion battery** – pricing to be announced **April 2010**

- Qualifies for **\$7,500 federal tax credit**
- Another tax credit **up to \$2,000** toward installing residential charging unit
- Other zero-emission incentives** from various states will be available



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NISSAN LEAF IT SOLUTIONS



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NISSAN LEAF PLATFORM



Front



Zero Emission



NISSAN LEAF CHARGE PORTS



Level 3 DC
Fast Charge



Level
1 & 2

Zero Emission



CHARGING BASICS



EVSE	Utility Service	Usage	Charge Power	Time to charge
Level I	120V - 12A	Opportunity	1.4 kW	16+ hrs
Level II	240V - 15A to 40A	Home/Public	3.3kW - 6.6 kW	4 – 8 hours
DC Fast Charge	480V – 100A to 400A	Public/Private	50 - 200 kW	26 mins (to 80%)

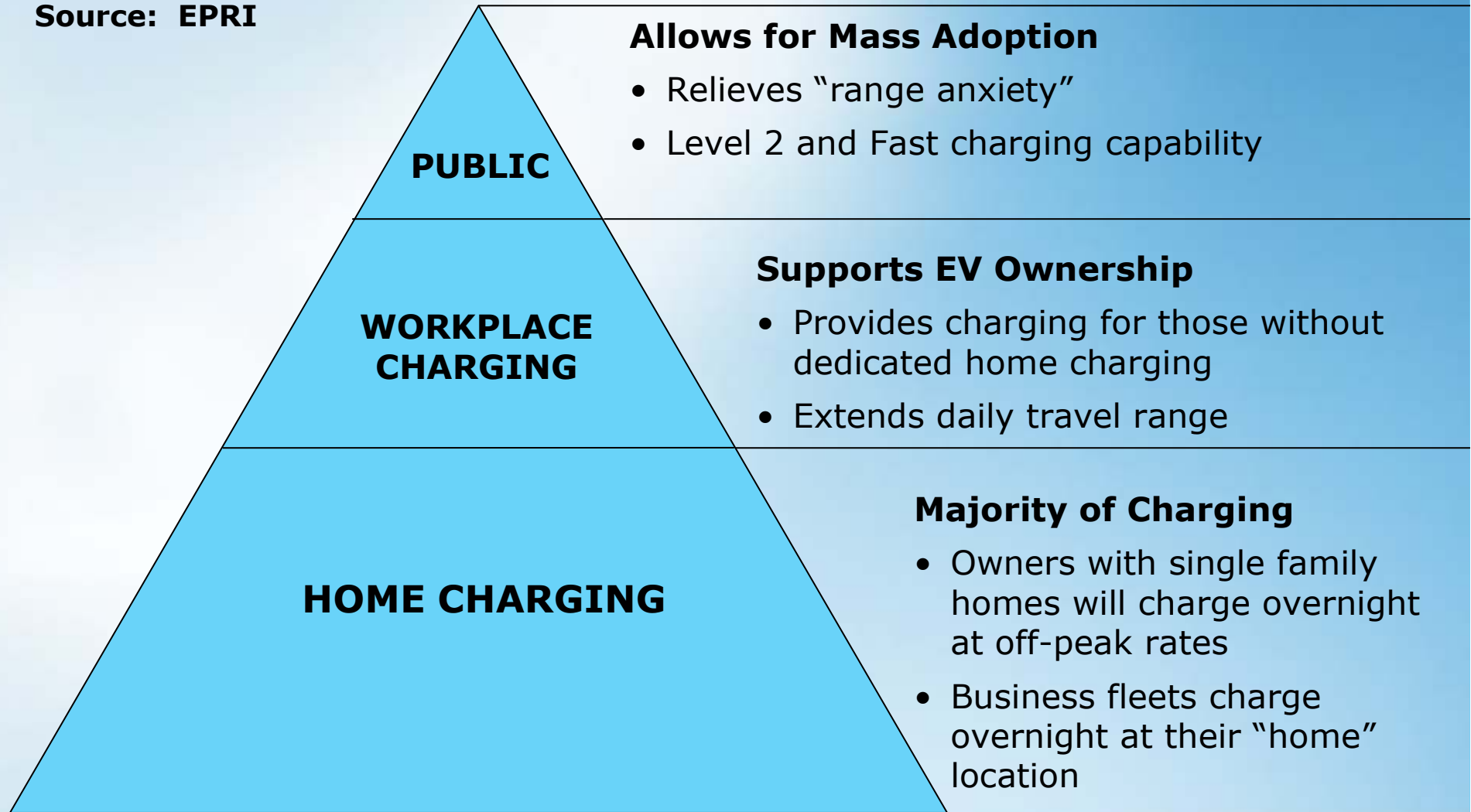


- In the near-term, Level 2 charging will be the majority for both at home charging and public charging
- Level 2 charging will be standardized (SAE 1772) by the LEAF's official launch and will be used by all OEMs for both electric and plug-in applications.
- Because of the nature of the equipment, Level 2 and Level 3 chargers must be "hardwired" for residential and business use.
- **The standard for Level 3 charging is still pending as of Q1 2010.**

INFRASTRUCTURE ROLLOUT



Source: EPRI



CHARGING NETWORK CONCEPT



Home charging

Overnight Charging



Medium distance



Home

Network charging

Destination Charging



Round trip



Office, Mall,
Public Transit

Pathway Charging



Long distance



Along transportation
corridors



→ **Develop Local Infrastructure/Charging Plan**

- Location strategy
- Quantity and type
- Who pays / funding opportunities
- Timing of infrastructure installation

→ **Identify existing and planned incentives for EV purchase and use**

- What incentives exist today?
- What incentives are possible?
- How to best communicate these incentives to the community/customer base?

→ **Map out current state of permit process**

- How can we streamline the process for residential EVSE installation?

→ **Identify additional stakeholders in each market**

- Large businesses, universities, govts, that are interested in joining effort to assist with infrastructure, employee incentives, permit process, volume, etc.

LEVARAGING EACH PARTNER'S STRENGTHS



Nissan

- Electric vehicle
- Battery
- EV knowledge & support
- EV service and maintenance

State and Local

- Promote EV awareness
- Infrastructure support
- EVSE Permit Process
- Legislation/Incentives
- Public education
- EV fleet vehicles

A SUSTAINABLE
FUTURE REQUIRES
ALL STAKEHOLDERS
WORKING TOGETHER

Companies

- EV fleet vehicles
- Workplace charging
- Incentives for employees
- Promote EV awareness

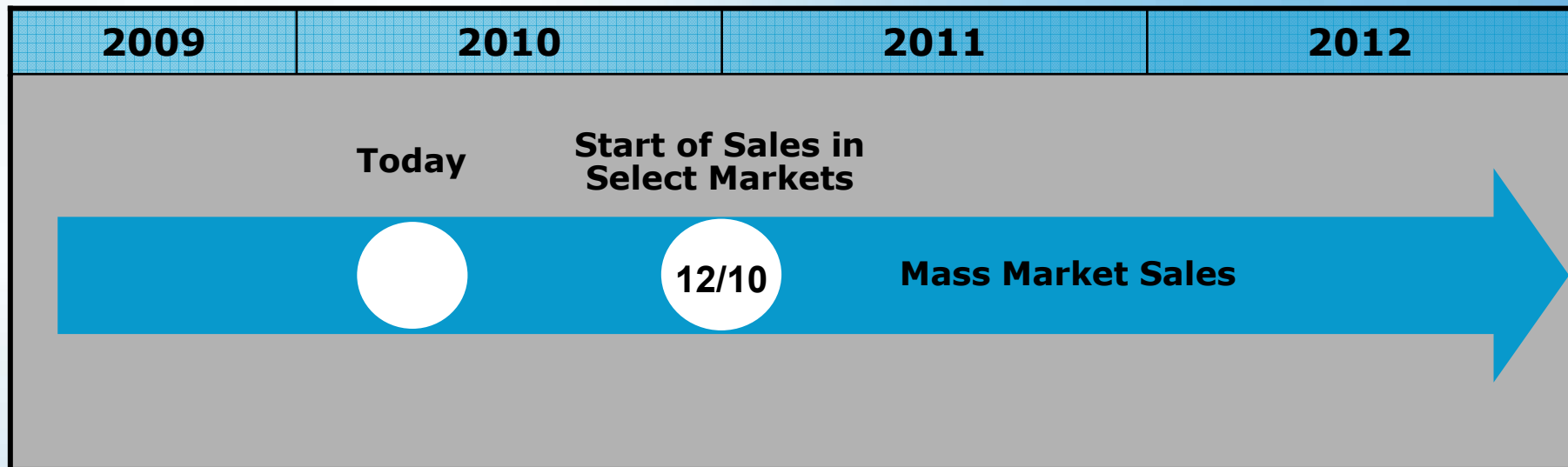
Utilities

- Expand renewable electricity sources
- Capacity expansion
- Time of use rates
- Demand response
- Infrastructure

WHEN WILL NISSAN'S EV BE AVAILABLE?



- Regionally, individual retail and fleet sales may begin as soon as Dec. 2010 if the infrastructure is ready
- EVs will be mass marketed to individual consumers in all 50 states by 2012





the new car

Zero Emission



AeroVironment EVSE PRODUCTS



**Level 2
Home Charger**



**Public Level 2 with secured
cable & billing**



**Level 3
Public Charger**

KEY CHARGING TERMS



- **Charger** – Device to change AC wall power into DC power for charging the battery. The charger is located on the vehicle.
- **EVSE** – Electric Vehicle Supply Equipment - provides AC wall power to the vehicle to be used by the on-board charger. This is the external hardware that is required to charge Electric Vehicles.
- **SAE J1772** – Society of Automotive Engineers (SAE) standard for conductive charging. Sets the industry wide standard for the charging connector and communications protocol.
- **Level 1 Charging** – 120 Volts, 12 Amps
- **Level 2 Charging** – 240 Volts, 15-30 Amps
- **Level 3 Charging** – 480 Volts, 100+ Amps, also known as DC Fast Charge