

# **GM ENERGY STRATEGY**

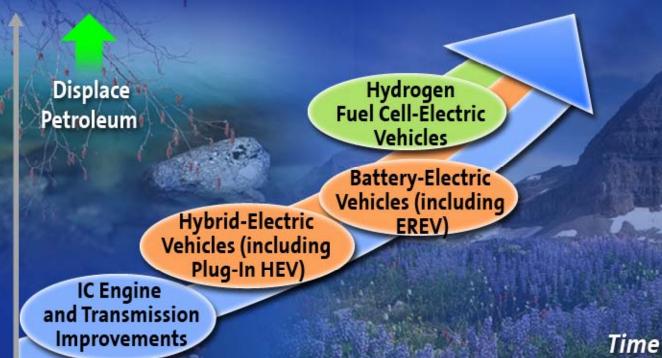
DISPLACE PETROLEUM THROUGH ENERGY EFFICIENCY AND DIVERSITY





### **ADVANCED PROPULSION TECHNOLOGY STRATEGY**

Improve Vehicle Fuel Economy and Emissions



Petroleum (Conventional and Alternative Sources)

Energy Diversity Alternative Fuels (Ethanol, Biodiesel, CNG, LPG)

**Electricity** (Conv. & Alternative Sources)

Hydrogen

# **Chevrolet Volt Extended-Range Electric Vehicle**



Up to 40 miles

BATTERY

Electric Drive

HUNDREDS of miles EXTENDED RANGE

Driving (Gasoline or E85)



# **GM/EPRI Utility Collaboration**

Includes more than 50 Utilities, and many of the industry's thought-leaders in electric transportation and grid interaction

**BC** Hydro Manitoba Hvdro Snohomish County PUD No. 1 Seattle City Light Avista Corp. Hvdro-Québec **Portland General Electric** NY ISO **PacifiCorp Great River Energy Central Hudson G&E** Hydro One **Northeast Utilities** Consumers EnergyRochester G&E United Illuminating Dairyland Power We Energies EnWin **NYPA ConEd** Nebraska Public Power Dist. Exelon FirstEnergy Constellation Energy Sacramento Municipal UD Lincoln Electric Pepco Holdings, Inc. **Hetch Hetchy Water and Power** Hoosier' Tri-State G&T **Dominion Resources Great Plains Energy** Pacific Gas & Electric Ameren **Duke Energy** Services Southern California Edison **Progress Energy** Salt River Project **Tennessee Valley Authority** Arizona Public Service **Arkansas Electric Coop** San Diego Gas & Electric Southern Company **EUROPE** Iberdrola, S.A. **Austin Energy** Golden Valley Electric Assn. CenterPoint Energy CPS Energy

Hawaiian Electric Co.



# Four Things We Need to Get Right

- The Vehicle
- Battery Charging



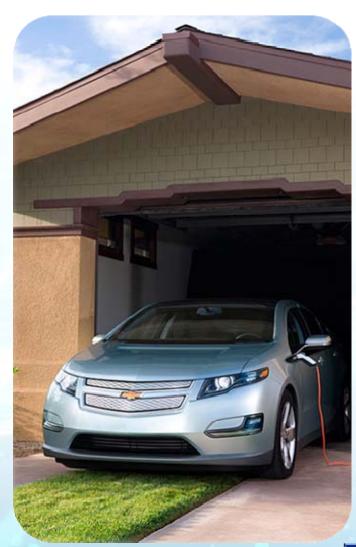
- Consumer Education
- Customer Experience



# **Plug-in Ready Communities**

### **Required Stakeholders**

- Dedicated project leader
- State, city, county
- Clean Cities Orgs/AQMD
- DOT
- Utilities (municipal and regional)
- Regulators/public utility commissions
- Permitting and code officials
- Local employers
- Local universities





# **Plug-in Ready Communities**

### **Required Stakeholders**

- Dedicated project leader —
- State, city, county
- Clean Cities Orgs/AQMD
- DOT
- Utilities (municipal and regional)
- Regulators/public utility commissions
- Permitting and code officials
- Local employers
- Local universities

#### **Desired Enablers**

Game Plan
Infrastructure/Incentives/Educational Outreach

Vehicle Purchase Incentives Charging Installation Incentives (Home, Work, Public)

Low Off-Peak Charging Rates (e.g. to encourage nighttime charging)

Green/Renewable Charging Options

Government Fleet Purchases

Building Codes to Include Home Charging Enablers

HOV Lane Access

Free Parking

Free Charging



## Is California Plug-in-Ready?

#### **Among the Stakeholders:**

Mayors of SF, San Jose, Oakland, and Los Angeles Utilities (SCE, PG&E, SMUD, SDG&E, LaDWP) and EPRI Bay Area and South Coast AQMD Clean Cities Silicon Valley Leadership Group // Bay Area Council // Google.org Who's engaged and what are they doing?

Can we increase and count on these incentives?

#### **Pending Vehicle and Infrastructure Incentives:**

AB 118 - \$5 million (2010-11) @ \$3000/veh = 1,667 vehicles

- -- Nissan Leaf = 1,000 vehicles in San Diego ...
- -- Volt plans are ambitious

#### **Infrastructure Efforts:**

3 public charging spots installed at City Hall in SF
Clean Cities stimulus proposal awards for EV charging
Significant stimulus award for EV infrastructure in San Diego
-- other awards modest (SF, LA)
Eased permitting initiatives proposed in SE

Eased permitting initiatives proposed in SF

Over 2000 existing charge spots in CA could be easily refurbished

What will be in place by Nov 2010?

#### **HOV Lane Access:**

SB 535 – Legislation introduced



# A Full Portfolio of Solutions ...

Will be Required to Meet CO2 Targets and Satisfy a Broad Range of





# **Backup Slides**



### **Strategy to Achieve a Plug-in Ready City**

Required Stakeholders:	Required Enablers:
Dedicated Project Leader	Establish a public charging infrastructure plan;
	Establish a local/state incentives plan;
	Establish a marketing and educational outreach plan
State Government	Provide state tax credit for vehicles (>\$2,500/16kWh vehicle) and charging equipment and installation at home/multi-family home/workplace/public (up to \$3,000/home; \$30,000/other site with 10 charge ports)  Eliminate state sales tax on vehicle purchase;  Commit/fund government fleet purchases (200 vehicles)  Note: Point-of-sale consumer incentives more effective than end-of-year tax credits
<ul> <li>City/County Government</li> <li>Clean Cities Orgs / AQMD</li> </ul>	Provide incentives for vehicle purchasers (see above - work with state) and charging equipment and installation (see above - work with state) Install public charging spots in key locations (30 distributed locations; meeting SAE J1772 level 2 (240V) and J2836 standards); refurbish existing charge sites; Establish free parking; Commit/fund government fleet purchases (25 high-profile vehicles)
• DOT	Provide HOV lane access for plug-in vehicles; Eliminate vehicle registration and license fees
Permitting and Code Officials	Prepare for eased/fast/self-permitting of home/public charging installation; Ensure new home/building codes/major renovations provide for vehicle 240V charging
<ul> <li>Utilities (municipal &amp; regional)</li> <li>Regulators/Public Utility</li> <li>Commissions</li> </ul>	Provide rebate for vehicle purchasers (add'l \$2,500/16kWh vehicle); Provide and incentivize home/building charging installation electrical service (i.e. provide no/low cost installation financed thru monthly utility bill); Provide free charging or compelling low-cost EV rates (3-4 cents/kWh); Provide "green" electricity options; Commit/fund commercial fleet purchases (25 high-profile vehicles)
Large Local Employers     (as Early Adopters)	Employers (3 major corporations) provide work-place charging (25 park/charge spots) and employee vehicle purchase incentives (add'l \$2,500/vehicle); Commit/fund corporate fleet purchases (25 vehicles)
Local Universities	Provide campus charging and free parking (10 distributed charging locations); Commit/fund university fleet purchases (5 high-profile vehicles)