ComEd Electric Vehicle Strategy

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Background

• All major vehicle manufacturers have plug-in hybrid electric vehicles (PHEVs) or all-electric vehicles (BEVs) in development

• Several vehicle launches announced as early as 2010-2011

• Collaboration across industries is unprecedented, including:
  - OEMs
  - Utilities
  - Charging equipment providers
  - Standards committees
  - Governmental entities
  - Research organizations

• There is much to be done to prepare the market for this very viable transportation alternative
  - Consumer education
  - Charging infrastructure
  - Codes and standards
  - Policy and rates
ComEd’s Green Fleet & EV Initiatives

• Green Fleet:
  ✓ 141 hybrids, including cars, SUVs and bucket trucks
  ✓ 10 converted Toyota Prius PHEVs
  ✓ 2.1 million gallons of B20 biodiesel consumed annually
  ✓ Our green fleet saves over 4,200 metric tons of CO2 emissions annually
    – Equal to taking 1,300 cars or 400 bucket trucks off the road for a year

• EV Initiatives
  ✓ EPRI Electric Transportation Program
    – GM Collaboration
    – PHEV trouble truck demonstration
    – PHEV impacts on the electric grid
    – Infrastructure Working Council
  ✓ PHEV demonstration
    – 10 Prius PHEVs in ComEd’s fleet, 2 in I-Go car sharing fleet with integrated smart charging technology
    – Demonstrating advanced charge management methodology
  ✓ Chicago Clean Cities Grant Project
    – Fleet electrification
    – Public charging infrastructure, including solar charging canopy
  ✓ Chicago Electric Vehicle Consortium
    – Building and electric codes
    – Consumer outreach
EV Challenges & Opportunities

• Consumer education
  ✓ Understanding the technology choices (HEV, PHEV, EREV, BEV)
  ✓ Costs and benefits of owning a plug-in vehicle
    – Fuel savings
    – “Where will I plug-in?”
    – Home wiring upgrades
    – Availability of “opportunity” charging facilities

• Design standards & codes
  ✓ Code requirements
    – NEC, municipal building codes
      o Single vs. multi-resident
      o Commercial fleets
      o Workplace vehicle charging
      o Public vehicle charging
  ✓ Hardware design
    – Plug (e.g., J1772)
    – User interface
  ✓ Communications
    – Wired vs. wireless
    – Messaging between vehicle and electric grid (e.g., J2847)
EV Challenges & Opportunities

- Public charging infrastructure
  - Location, Location, Location!
  - Who should/can own it?
    - Utilities, 3rd party / private owner, both
  - How will vehicle owners pay for this service? (accounting, billing, reporting)
    - Subscription vs. “vending machine” service models
    - Potential resale/redistribution issues?
  - Safety & security
    - User authentication
    - Charging station integrity and user safeguards

- Electric grid impacts
  - Use of Smart charging and other Smart Grid technology
  - Impacts of fast-charging
  - V2G
    - How will utilities & grid operators leverage available capacity
    - Will EV owners participate?

- Policy and rates
  - Incentives and rebates
  - Advanced rates and metering
    - TOU, real-time pricing, V2G rates
ComEd EV Strategy Overview

• There are four key objectives to ComEd’s Electric Vehicle Strategy:
  ✓ Gain **first-hand experience** with plug-in electric vehicle technology and charging requirements.
  ✓ Study **system impacts** from electric vehicle charging and utilize advanced methods to mitigate those impacts.
  ✓ **Ready the Chicago EV market** through understanding factors that will affect consumer adoption, and leveraging stakeholder relationships to address those factors.
  ✓ Assess the **future of EV technology** and the **enabling Smart Grid technologies**.
ComEd’s EV Strategy

Grid Impacts
- Local distribution
- System capacity
- Charge management
- Localized adoption rates

Policy & Rates
- Federal & state legislation
- Advanced rates & metering
- Incentives, rebates
- Public charging
- Load control

Outreach & Education
- Customers
- Policy makers
- Auto manufacturers
- Other stakeholders

Customer Experience
- In-home charging
- Workplace and public “Opportunity” charging

Electric Service
- Single vs. multi-unit
- Parking garages
- Public charging
- Local electric codes

Market Research
- Early adopters
- Focus groups
- Market segmentation