

SCE's PEV Readiness Initiative...

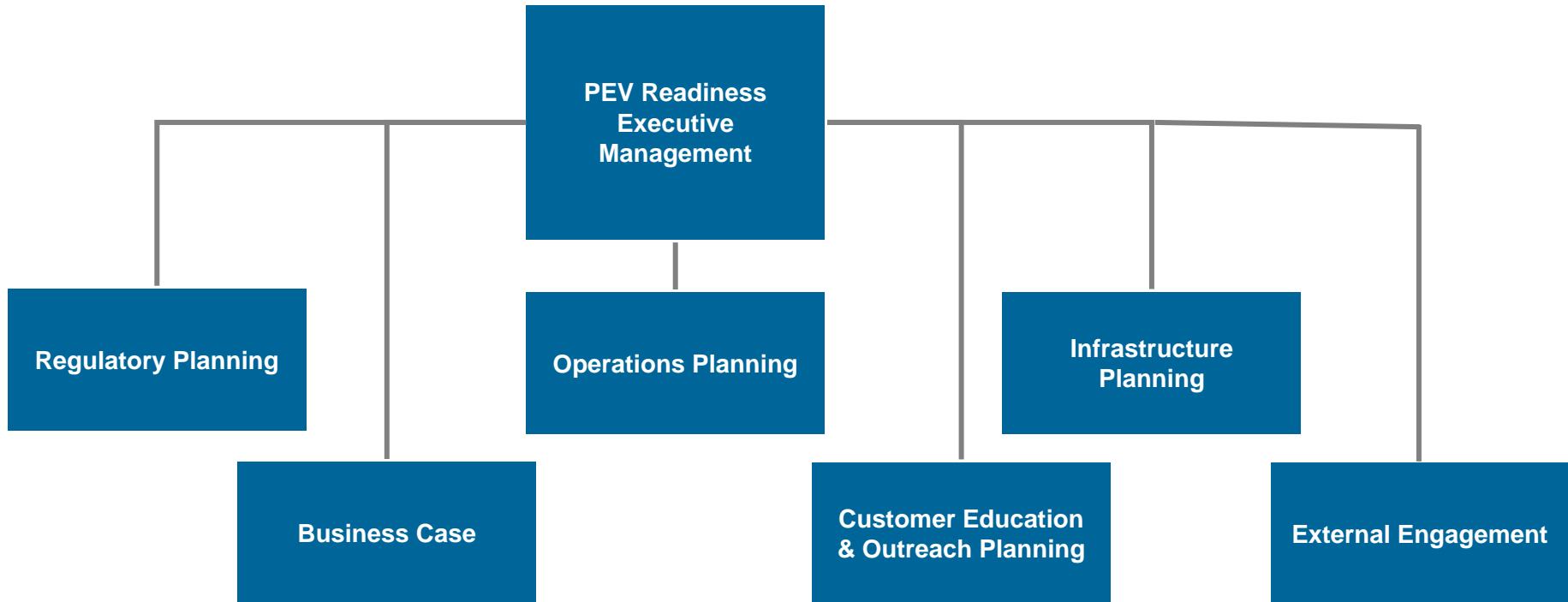
A Corporate Wide Effort

**ADVANCED
TECHNOLOGY**
Transmission & Distribution Business Unit



Ed Kjaer
January 25, 2010

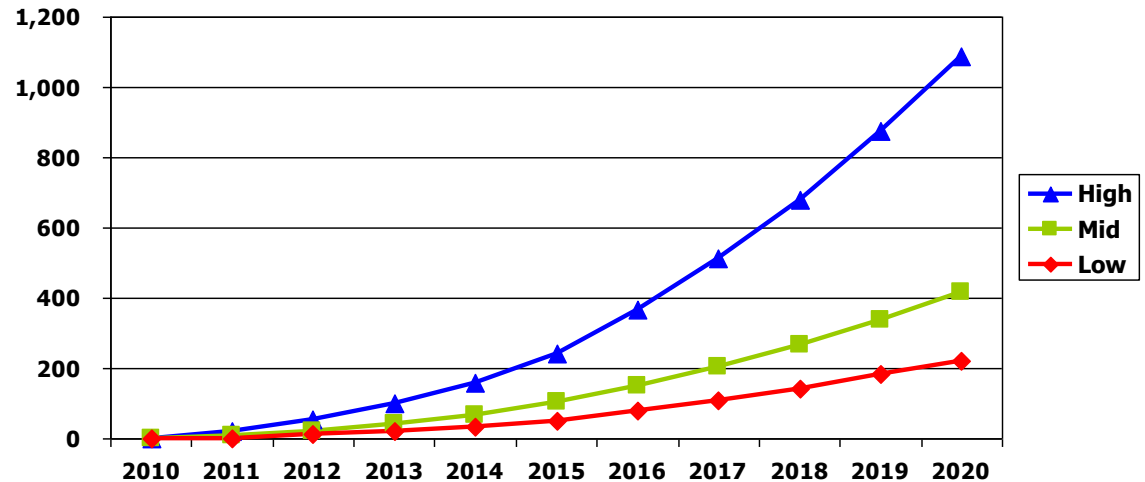
Program Structure



PEV Adoption Forecast for SCE Service Territory

Early Market (2010-2014)

- Modest number of PEVs
- Early adopters with high expectations
- Uncertainty around market development
- New policies and standards developed & implemented

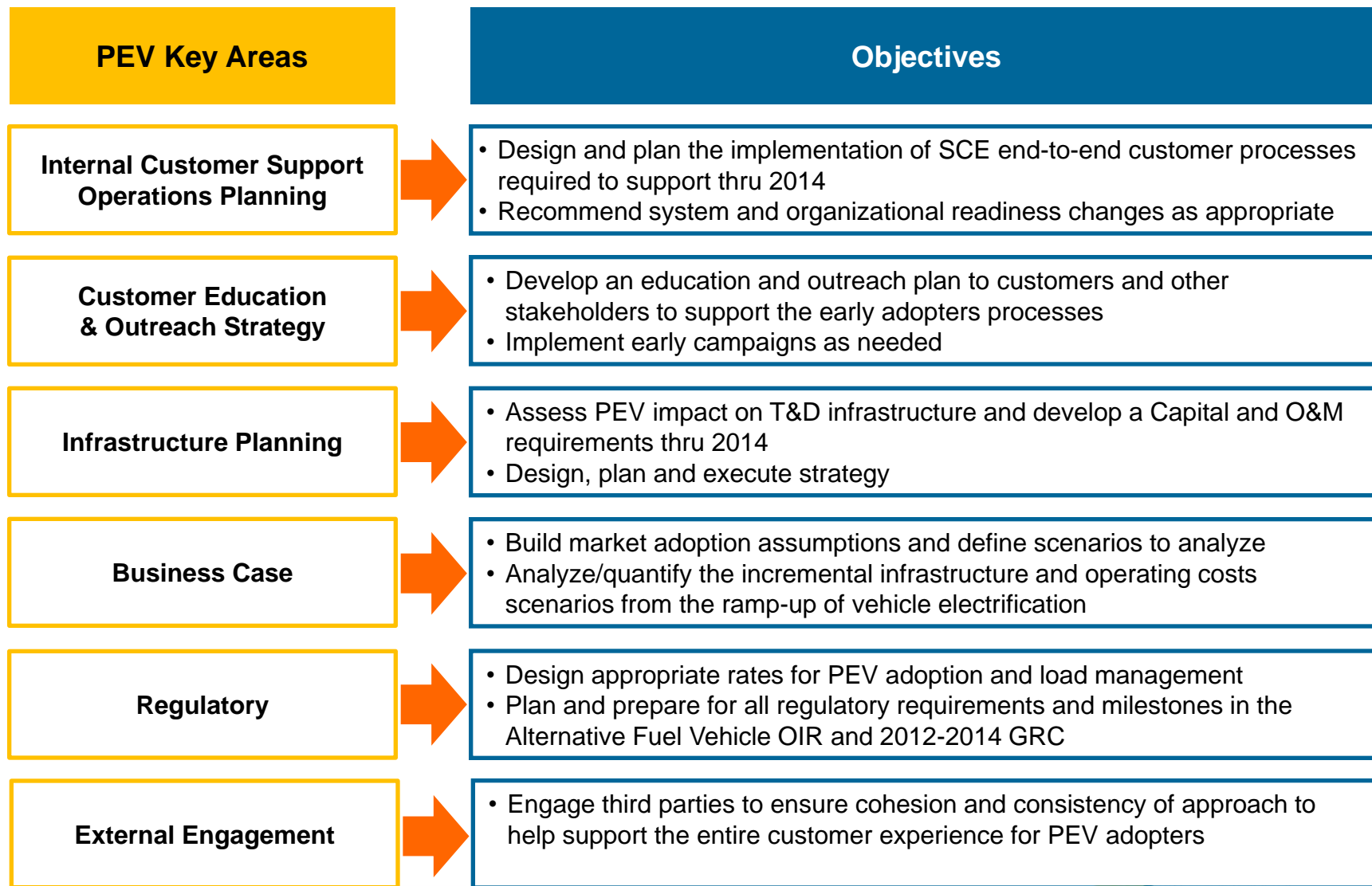


Growing Market (2015 +)

- Growing number of PEVs
- Some clarity around customer charging behavior and impacts to electric grid
- Growing significance of load management

We are in the early days. All of us – policy makers, auto manufacturers, auto dealers, utilities – need to figure it out together.

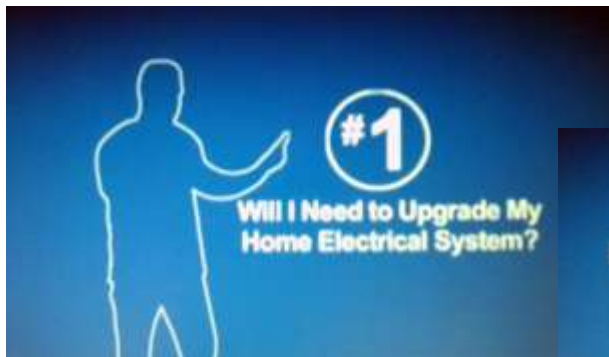
PEV Readiness- Program Objectives



Internal Customer Support Operations Planning

- **PEV purchasers may need electrical work and Electric Vehicle Service Equipment (EVSE) installed in their home.**

The process for equipping a garage or other location with electric fueling and metering can involve multiple contractors and vendors, as well as city inspections. Streamlining the process is necessary to improve the customer experience and ensure scalability.



Customer Education & Outreach

Messages focused on the 3 “plug-in ready” steps

- Capturing information on likely PEV purchasers as input for system planning
- Early media outreach to lay foundation for 2010 education
- Consumer education and survey research at LA Auto Show
- PEV readiness information on SCE.com in four languages
- Automated customer service line leads customers to Web site
- Direct marketing collateral developed

www.sce.com/pev

The screenshot displays the SCE.com website interface for Plug-In Electric Vehicles. At the top, there is a navigation bar with links for Home, About SCE, Outage Center, Contact Us, My Account, and a search bar. Below this is a secondary menu with categories: Residential, Business, Customer Service, Environment, Community, Safety, and Edison International. The main content area is titled 'Electric Transportation - Plug-In Electric Vehicles' and includes an 'Overview' section. A prominent banner for 'The Los Angeles Auto Show 2009' (December 4-13) features an image of a car and a charging station. Below the banner are buttons for 'Overview', 'Get Plug-In Ready', and 'Rate & Charging Options'. A sidebar on the left contains a 'SCE.com Log In' form with fields for 'User Name:' and 'Password:', a 'Remember Me' checkbox, and a 'LOG IN' button. Below the login form is a list of links: 'Forgot your password?', 'New user? Learn more | Register', 'Environmental Commitment', 'Smart Grid', 'Edison SmartConnect™', 'Electric Transportation', 'Plug-In Electric Vehicles', 'Overview', 'Get Plug-In Ready', 'Rate & Charging Options', 'Planning For The Future', 'Commitment to the Future', 'Energy for the Future', 'Technology for the Future', 'Cleaner Air for the Future', 'A Better Climate for the Future', 'California Leadership for the Future', 'News', 'Related Links', 'Power Generation', 'Renewable Energy', and 'Transmission Projects'. At the bottom right, there is a dark blue box with the text 'Are you considering the purchase of a plug-in electric vehicle?' and a 'Take our survey >>' link.

RATE OPTIONS

SCE customers who purchase a plug-in electric vehicle can sign up for one of three rate options:

SCE's standard residential rate (D-Rate)

Tiered price per kilowatt-hour increases over “baseline” allocation as usage increases.

Whole-house “time of use” (TOU-D-TEV Rate)

Tiered structure similar to standard residential rate, but provides lower rates when charging ‘off-peak’. This rate may be ideal for customers who have low usage during peak daytime hours of 10 a.m. to 6 p.m. and includes a “super off-peak time” of 12 a.m. to 6 a.m.

Electric-vehicle-only “time of use” (EV-1 Rate)

This option requires a second meter to measure the electricity “fuel” usage and is billed separately from the rest of the house. The electric fuel rate is discounted for charging during ‘off-peak’ night-time hours. Provides the lowest rate for electric vehicle charging, but also involves more initial set-up cost and time. Off peak time is 15 hours long from 9 p.m. to 12 p.m.

*Actual rate costs per kWh vary by location, overall use and time of year.

Infrastructure Planning

- **Minimal system-wide concerns during early market growth.**
During early market development, when the number of plug-in electric vehicles is still relatively small, we do not anticipate any significant system-wide impacts to the electricity grid or electricity supply.
- **Local distribution system impacts need to be managed.**
We anticipate the need to reinforce the distribution system in some neighborhoods that have large numbers of plug-in vehicle owners and faster, higher-voltage charging systems. We are currently conducting extensive circuit modeling to “anticipate” where we need to address circuit reliability challenges as a result of PEV concentrations.
- **Demand-side management will be increasingly important.**
As the number of plug-in electric vehicles grows over time, how customers charge their vehicles, at home and using public/workplace charging infrastructure, will become a significant factor in determining the impact to the electricity grid. Avoiding spikes in electricity demand as a result of charging patterns will be an important policy objective.

External Engagement

As part of the PEV Readiness Program, SCE is designing, planning and implementing improvements to its customer process and T&D infrastructure in preparation for the introduction of PEV in the marketplace

However, many activities are outside of SCE's direct control, including:

- Beyond-the-meter activities (panel, EVSE, etc.)
- OEM and their vendor activities
- Local city permitting/inspection
- Deployment of public charging stations

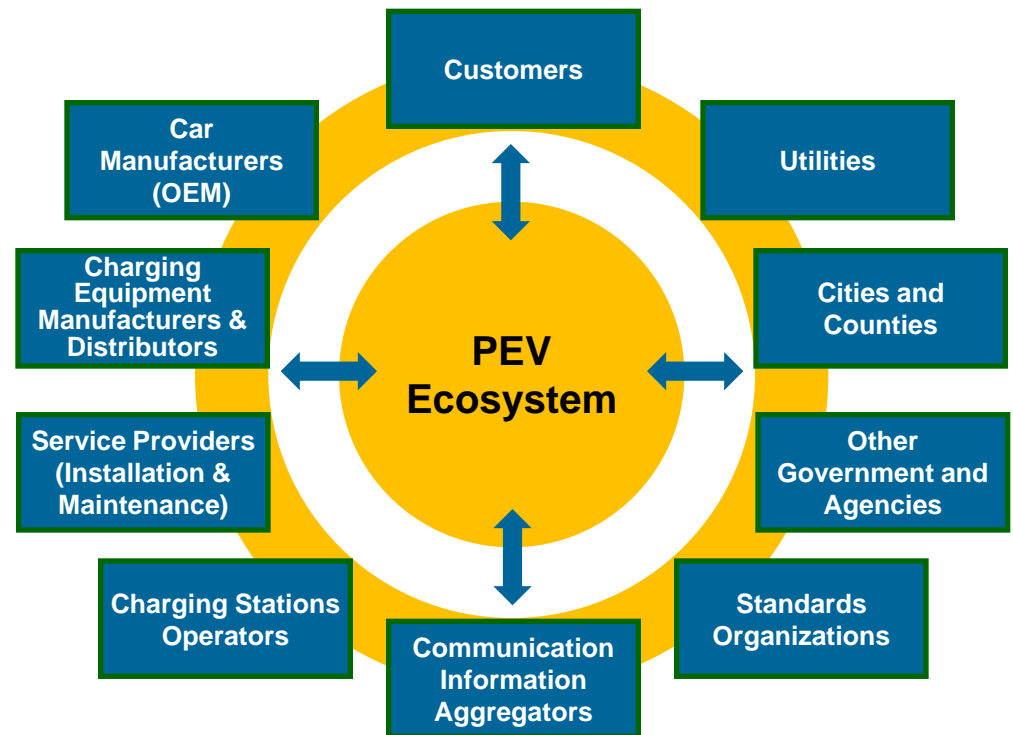
Improving the entire customer experience for PEV adopters will require the engagement of many players in addition to internal SCE Ops

SCE is executing an external engagement strategy with key stakeholders in the PEV ecosystem to support the ongoing PEV Readiness Program

External Engagement- EV Ecosystem

•The PEV ecosystem includes a number of players with which SCE may have to interact.

- 1/ Regulator & Legislator Strategy (CPUC, SCAQMD, CEC, CARB & Legislature)
- 2/ Stakeholder Strategy (Local Cities/LA, OEMs & their vendors, EVSE suppliers, other utilities)
- 3/ Consumer Strategy (Public Relations, Advertising, Employees, other)



Edison Electric Institute PEV Readiness Pledge

- **Infrastructure**

- Proactively work with state regulatory and legislative bodies to address impacts on the electricity grid and work with stakeholders to develop a comprehensive local charging infrastructure deployment plan

- **Customer Support**

- Assure a robust customer support service in place

- **Customer and Stakeholder Education**

- Collaborate with state and local officials, public /private entities, and automakers to help implement a broad nationwide education program highlighting the benefits of electric transportation

- **Vehicle and Infrastructure Incentives**

- Work with federal, state, and local stakeholders to help develop ownership incentives for vehicles and infrastructure deployment

- **Utility Fleets**

- Develop new sustainable fleet acquisition and operations plans

Summary

- PEVs are coming... beginning this year!
- Utilities need to get PEV Ready
- For SCE- It's a Corporate wide initiative with line of sight to senior leadership
- Six work streams with Director level leadership
- Significant analytics required based on little actuarial data
- Need to collaborate with all stakeholders
- Trick is to balance; *system reliability*, prudent cost *effective investment* and *customer needs* within environment of significant uncertainty



For more information on SCE's Smart Grid strategy, news, and updates, go to: www.sce.com/smartgrid

For more information on SCE's Electric Transportation strategy, news, and updates, go to: www.sce.com/pev

CHARGING OPTIONS

Most PEVs will charge at one of three charging “levels.” Higher charging levels may require upgrades to the customer’s electrical system.

LEVEL ONE:

Is done on a standard 120-volt outlet. Typically won’t require modifications to electric panel or home wiring. Electrical draw is the rough equivalent of a 1500-watt personal hair dryer. Most plug-in hybrids (PHEV) will take 4 to 6 hours to fully charge. Average charging time for a battery electric vehicle (BEV) is 12 to 24 hours.

LEVEL TWO:

Is done on a 240-volt rated charging unit. Will require a separate circuit and may require changes to electrical panel. Average charging time for a PHEV is 1 to 3 hours and a BEV is 6 hours.

LEVEL THREE:

Is done with 480-volt connection or other commercial voltage. Is the fastest charging method available and is used for commercial charging only- not residence.