Plug-In Electric Vehicle Opportunity For Austin Energy

Presented to: EUC

September 20, 2010

The Perfect Storm

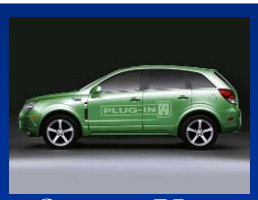
- **Economics**
  Cheap oil is running out
- **Environmental**
  Pressure to curb transportation pollutants
- **National Security**
  Pressure to curb dependence on foreign oil

Plug-In Partners was a national grass-roots initiative to demonstrate to automakers that a market for Plug-In Hybrid Electric Vehicles (PHEV) exists today.

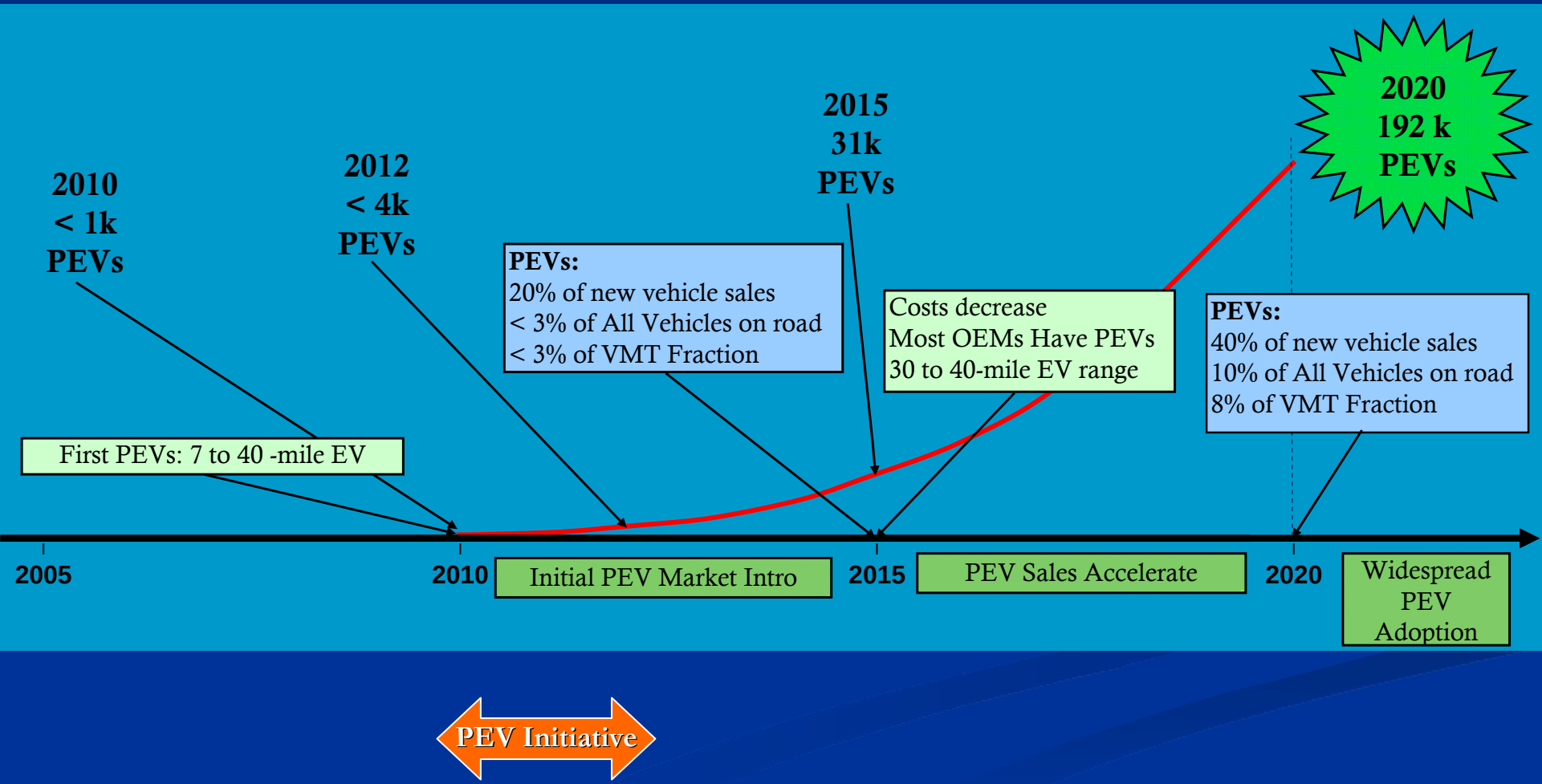
- Initiated January 2006
- Successfully completed October 2008

Since 2007: AE working with EPRI & ~60 utilities from US and Canada on PEV

Plug-ins Are Coming to Central Texas

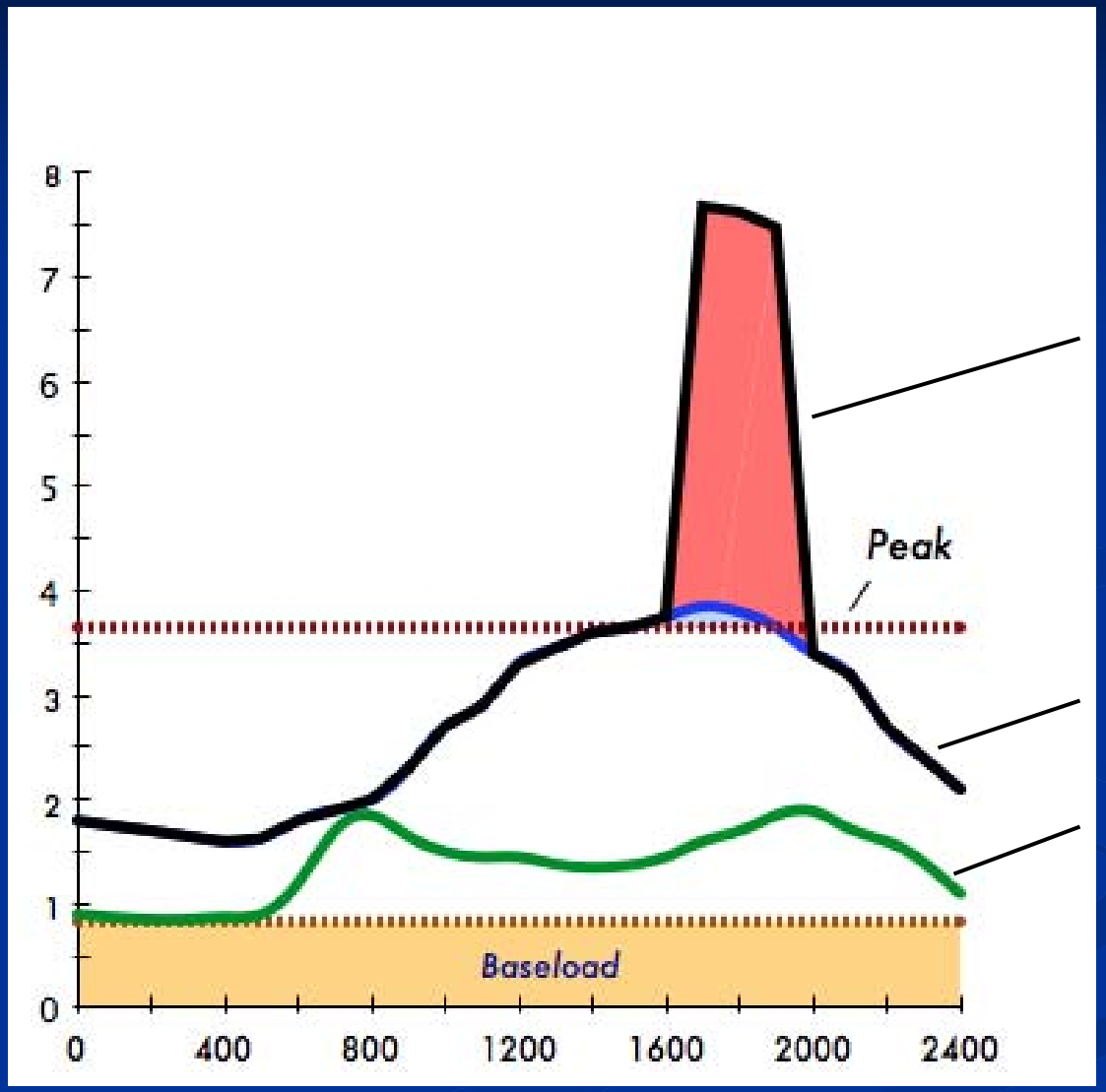
	PHEV or EREV	EV or BEV
Near Production	 Saturn Vue  Chevrolet Volt  BYD Auto F3DM  Ford Escape	 Nissan Leaf  Tesla Model S  Daimler Smart ForTwo  Mitsubishi iMIEV  Think City  Hyundai i10
Pre-Production	 Toyota Prius  Volvo V70  Chrysler Town & Country  VW Golf  Audi A1	 Subaru R1e  Dodge ZEO  Peugeot iOn  BMW Mini e  Daimler Smart ED

How Many PEVs Do We Prepare For?



PEV Initiative

Utility Impact from Home Charging
(Illustrative)



Source: Pecan Street Project

P

Ch

Level 1 (120

Level 2 (240

DC/D

LIGHT DU

1. Home Charging	2. Apartment/ Condo Charging	3. COA/AE Fleet Charging

Residential Program:

AE Owns/Installs the Charging Station

"I want to drive truly zero emissions using Texas Wind"

"I want a fixed price for my transportation fuel"

"I want to drive on the lowest cost energy"

Program Components might include:

- Free installation of Level 2 EVSE
- AE has selective control of charging
- AE collects data on driver behavior
- Free emergency service
- Free public charging
- $ X/month subscription fee

- Wha
- How
- Wha
- What communication infrastructure is required?

COA ELECTRIC TRANSPORTATION ROADMAP

COA programs w/ OEMS (Ford, Chrysler, GM, Nissan,etc.) begin

OEM Projection: First PEVs: 7 to 40 - mile EV Range Li Ion Battery

EPRI Projection for PEVs:

Austin Energy Estimate of PEV Deployment from 2010 to 2020

2020 - 192,000 Light Duty PEV Vehicles in Austin Service Territory

OEM Projection: 40-mile+ EV Range

EPRI Projection for PEVs:
40% of New Vehicle Sales
10% of All Vehicles on the Road
8% of VMT Fraction

CECO Grant
38 Prius Conversions

2012 < 4,000 v

2010 | 2015 | 2020

Initial PEV Market Intro | PEV Sales Accelerate | Widespread PEV Adoption

COA Hybrid Fleet Conversion Program

AE RESEARCH w/CHRYSLER, GM, ERCOT & UT

PECAN STREET PROJECT DEMONSTRATION AT MUELLER
(Vehicle Integration w/ Smart Grid)

Deploy Test PEV Vehicles

Address Home Energy Consumption & Demand

Energy Choice Based on Cunsumer Needs

Ultra-Low Carbon Vehicles

Explore Load Shifting ... Peaks While Consi... Impacts o...

Begin Charging Station Testing

DOE Stimulus Grants (FOA -28)

1. Pecan Street Project
2. (FOA – 36)

ing Test

Charging

ards

t

y PEV Mechanics

Austin Energy Transportation Electrification

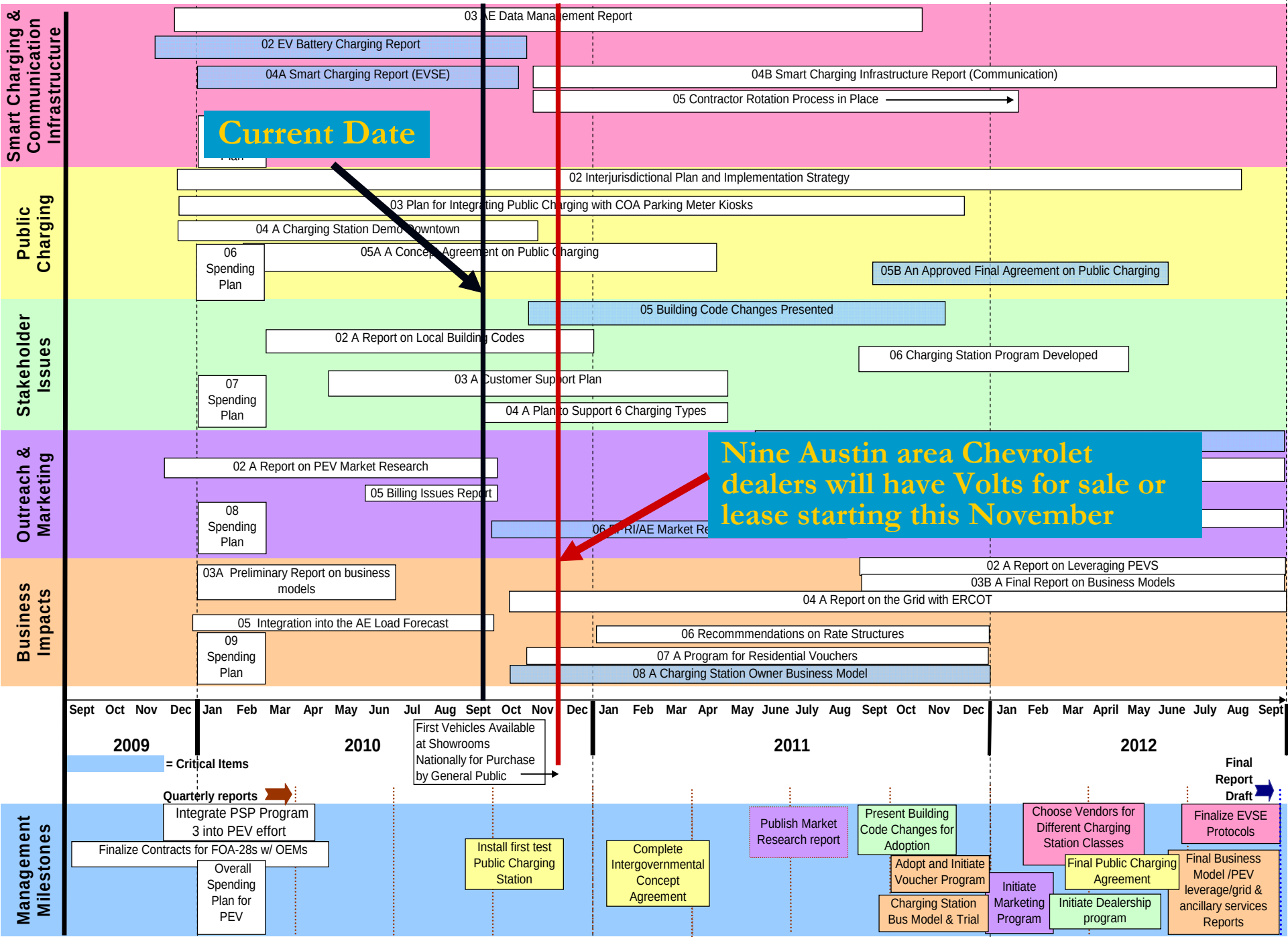
Near-Term Timeline

- Sept 2009 to Oct 2012
- Five Staff Committees
- Operational Pilot by Jan 2011

AE NEAR-TERM ELECTRIC TRANSPORTATION PROJECT

- Install First Test Public Charging Station
- Complete Intergovernmental Concept Agreement through CAMPO
- Final Public Charging Agreement
- Adopt Building Code Changes
- Initiate Dealership Program
- Adopt and Initiate Voucher Program
- Publish Market Research Report
- Initiate Marketing Program
- Choose Vendors for Different Charging Station Classes
- Finalize EVSE Protocols

AE TRANSPORTATION ELECTRIFICATION PROGRAM NEAR-TERM TIMELINE



Austin Energy PEV Initiative

Teams
Business Impacts
Outreach & Marketing
Stakeholder Issues
Public Charging
Smart Charging & Communication Infrastructure

- Potential PEV Business Models
- Enabling Programs for Incentives & Rebates
- Smart Charging Programs & Rate Structures
- ERCOT Related Issues

Austin Energy PEV Initiative

Teams
Business Impacts
Outreach & Marketing
Stakeholder Issues
Public Charging
Smart Charging & Communication Infrastructure

- Communication & Marketing Plan
- Understand Customer Issues & Preferences
- PEV Billing Issues

Austin Energy PEV Initiative

Teams
Business Impacts
Outreach & Marketing
Stakeholder Issues
Public Charging
Smart Charging & Communication Infrastructure

- PEV Infrastructure & Interface Issues
- Develop Plan for Customer Support
- Charging Station Program with Dealerships

Austin Energy PEV Initiative

Teams
Business Impacts
Outreach & Marketing
Stakeholder Issues
Public Charging
Smart Charging & Communication Infrastructure

- Local and Regional Public Charging Plan
- Determine Public Charging Costs
- Public Charging Demonstration

Austin Energy PEV Initiative

Teams
Business Impacts
Outreach & Marketing
Stakeholder Issues
Public Charging
Smart Charging & Communication Infrastructure

- Grid Impacts of PEV Integration
- Infrastructure Requirements
- Leverage PEVs with Gen/Load/Storage
- Determine Data Management Issues

To Design the Energy System of the Future the
"Pecan Street Project"
Brings Together:
City of Austin, Austin Energy,
University of Texas, Austin Chamber and Environmental Defense Fund
And National Corporate Partnerships with:
Dell, GE Energy, IBM, Intel, Oracle, Cisco Systems, Microsoft, Freescale Semiconductor and GridPoint

Pecan Street Project

Task 1 *Solar/Charging Test*

Research Objectives: Cost and value of solar charging

Evaluate storage with solar including a nighttime charging component

Task 2 *Residential Charging Test*

Research Objectives: Utility operational standards for PEV infrastructure for residential types

Demonstrate PEV charging using townhouse or multi-unit situation

Task 3 *Retail Standards Development*

Research Objectives: Utility operational standards for infrastructure for retail

Test public charging infrastructure in a retail shopping center

Thank You