

23RD ANNUAL

E SOURCE FORUM

SEPTEMBER 19-23, 2010 || WESTIN TABOR CENTER || DENVER, COLORADO

Austin Energy's Plug-In Electric Vehicle Program

Larry Alford
Strategic Planning & Enterprise Development
Austin Energy



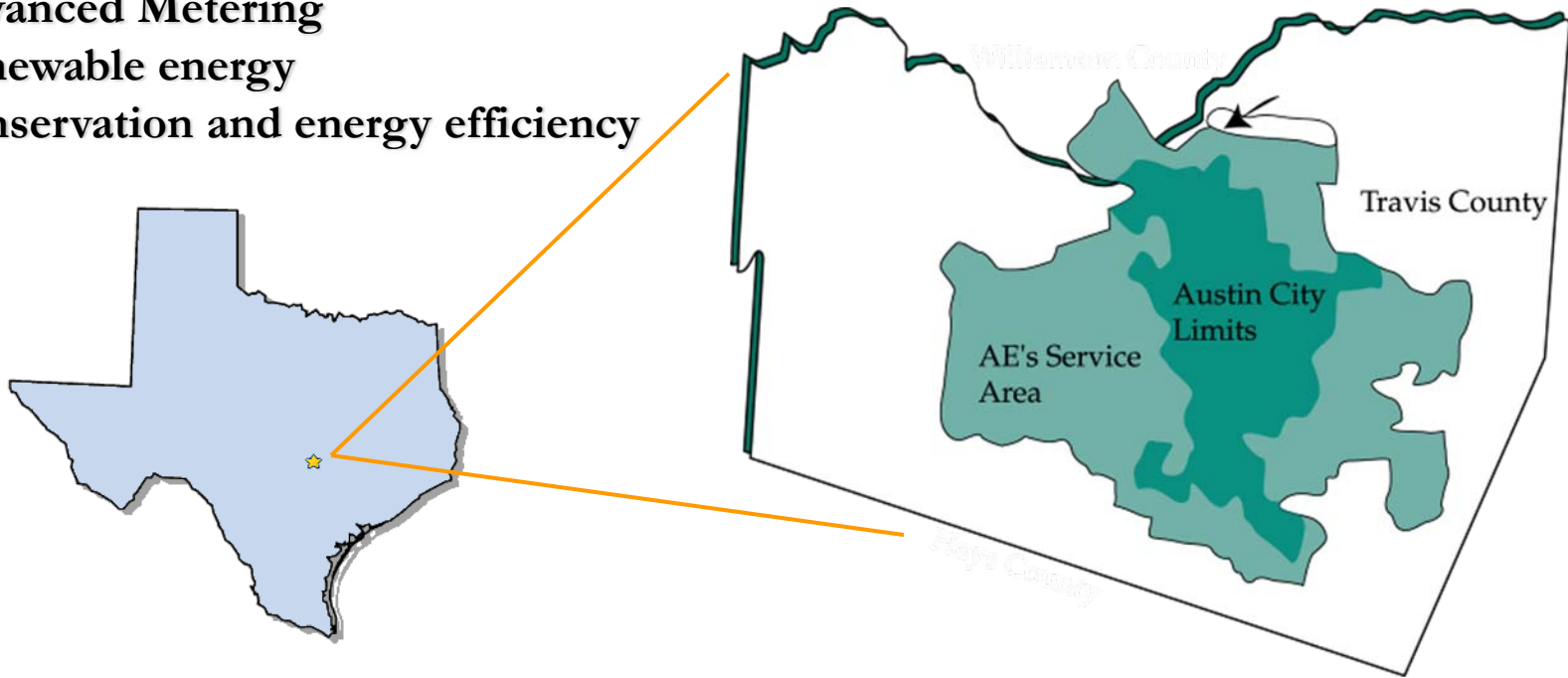


About Austin Energy

- 9th largest public power utility in the US
- Over \$1.3 billion in annual revenues
- Servicing almost 430,000 premises representing ~ 43,000 businesses and ~ 1 M population

Recognized as a leader in:

- Plug-In Electric Vehicles
- Advanced Metering
- Renewable energy
- Conservation and energy efficiency



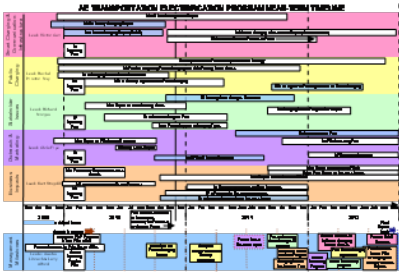


Austin Energy Initiatives



2006 *Plug-In Partners*

2008 *Smart Charging Pilot Project*



2009 *Plug-In Electric Vehicle Project*

2010 *Central Texas PEV Summit*



2010 *ARRA Grants*



Austin Energy Activities



AE sponsored an *AISD PHEV school bus*

EPRI/Eaton PHEV trouble truck



Austin Bergstrom International Airport
electrification project

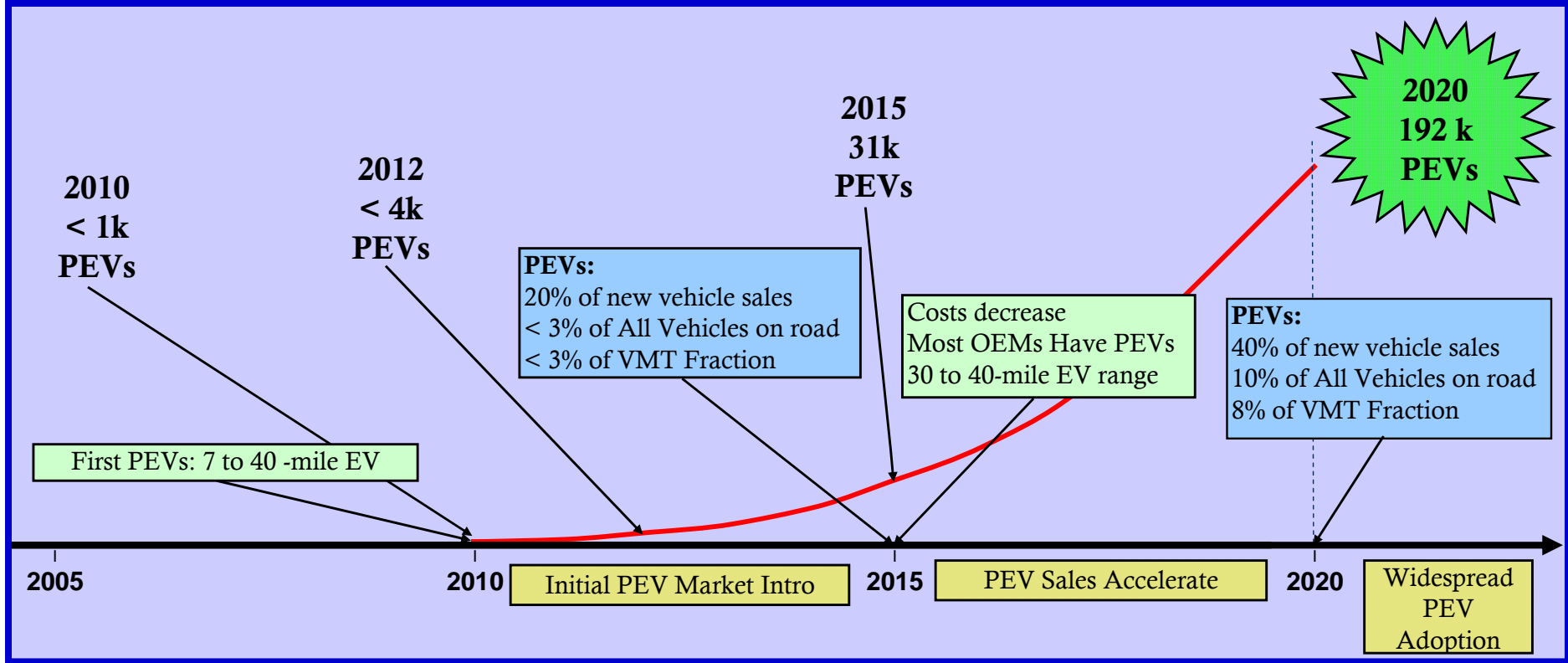
Austin is a launch city for the *Chevrolet Volt*



The *Pecan Street Project* includes a major effort to study the impacts of PEVs: pecanstreetproject.org



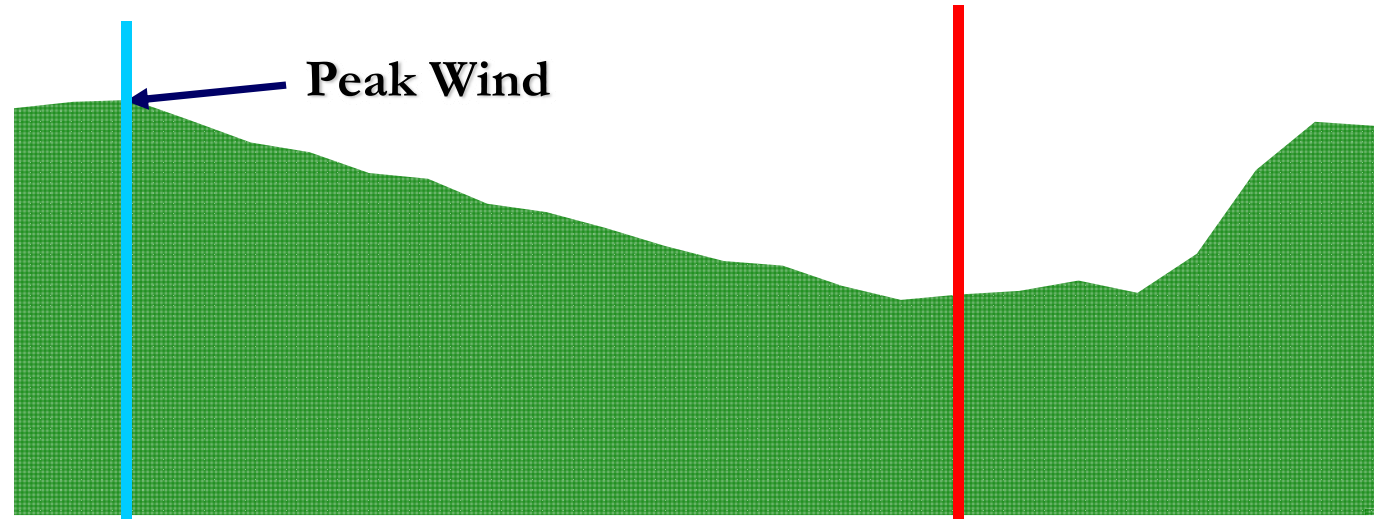
What is the Opportunity?



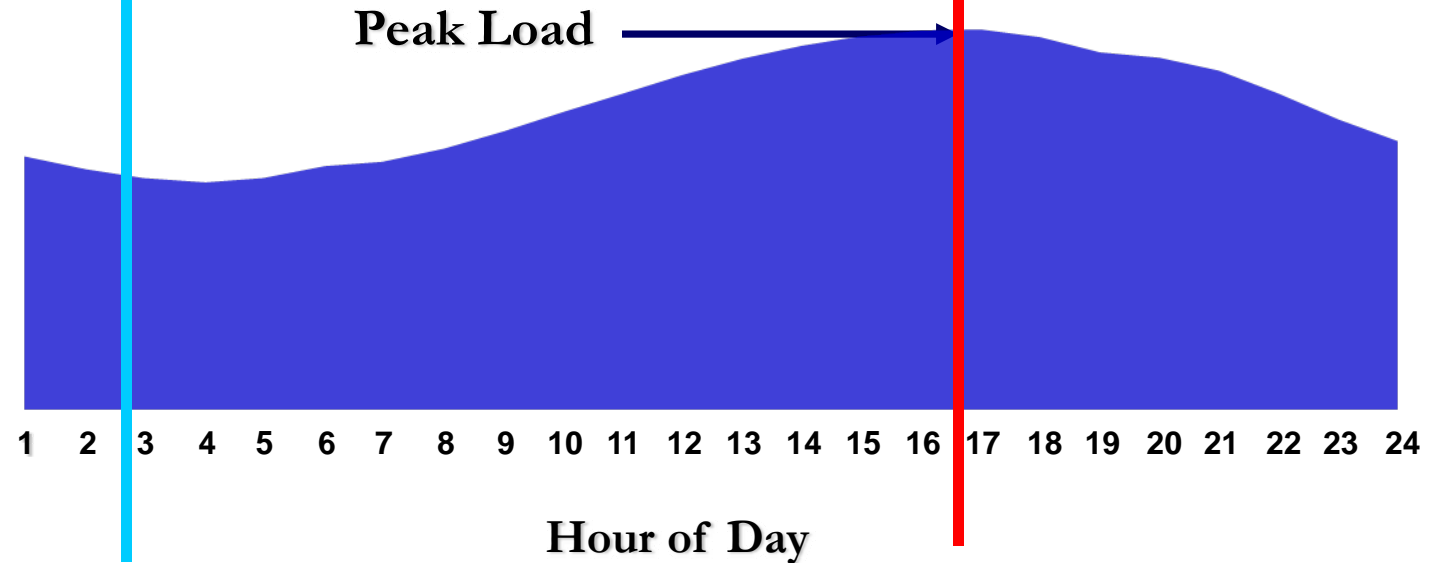


PEV Wind Charging Opportunity

Typical West Texas Wind Profile



Typical AE Summer Load Profile



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

Hour of Day



PEV Charging Infrastructure

| Charging Levels | | Approximate Load Equivalence |
|---------------------|--------------|------------------------------|
| Level 1 (120 -VAC) | 1.4 kW | ~ hair dryer |
| Level 2 (240 - VAC) | 3.3 - 6.6 kW | ~ clothes dryer |
| DC/DC | 50 kW | ~ 10 homes |

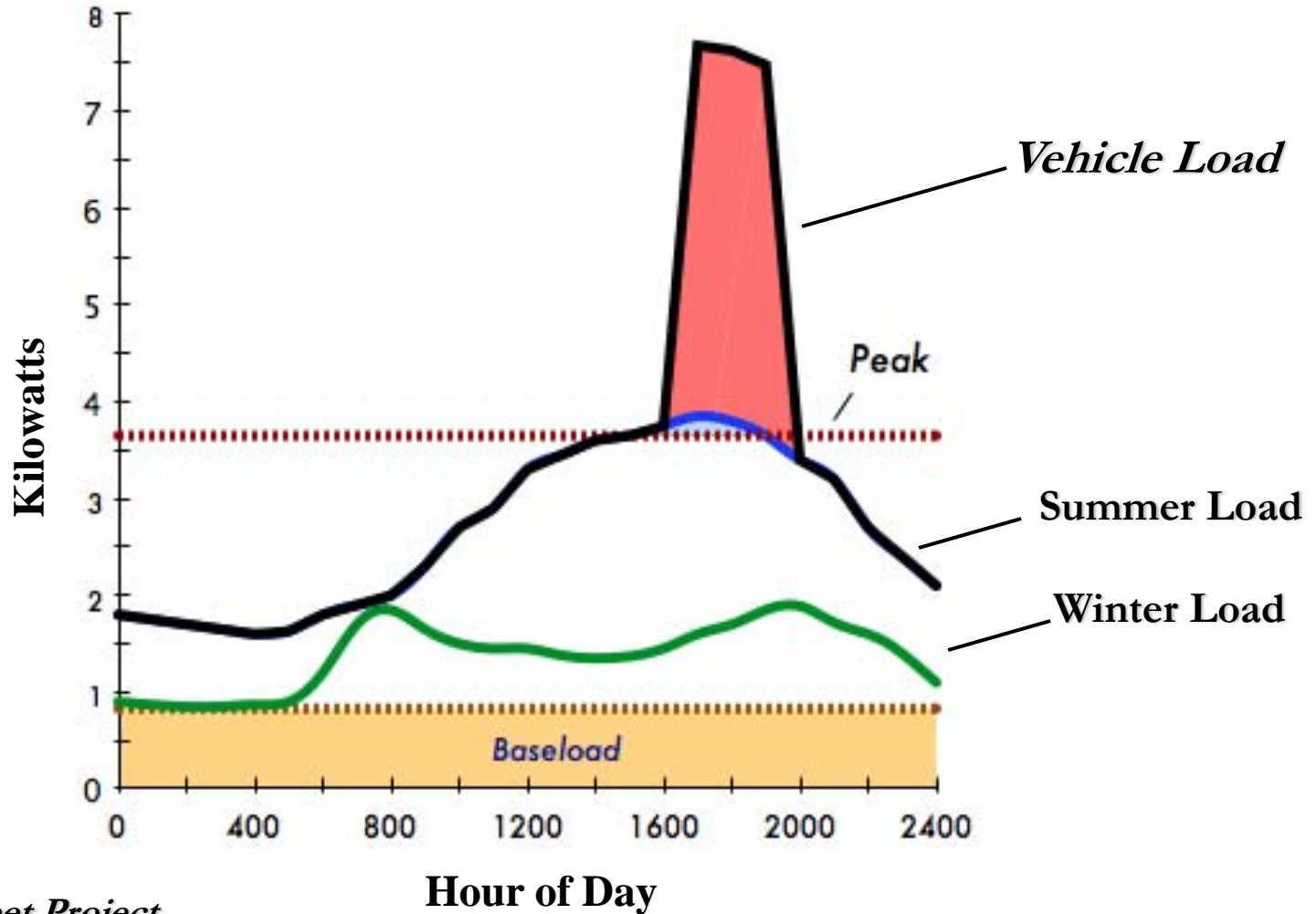
| LIGHT DUTY VEHICLES | | | | | | HEAVY DUTY VEHICLES | | | |
|------------------------|---------------------------------------|-----------------------------------|------------------------------------|-----------------------------|--------------------------|--------------------------------|-----------------------|--------------------------------|----------------------------|
| 1. Home Charging | 2. Apartment/ Condo Charging | 3. COA/AE Fleet Charging | 4. Private Fleet Charging | 5. Commercial/ Retail | 6. Public Charging | 7. Mass Transit Buses | 8. School Buses | 9. Non- Road Vehicles | 10. Commercial Fleet |



Home Charging Impact

One PEV at One House

(Illustrative)



Source: Pecan Street Project



PEV Charge Management Issues

- **“Clustering” is the ganging of PEVs in neighborhoods and can impact transformers with the potential to require costly electric grid upgrades**
- **Charge management programs can mitigate PEV “clustering” issues that could force costly grid upgrades**
- **While time-of-use rates are a potential component of charge management, they do not resolve the issue of “clustering”**
- **Charging infrastructure ownership is more than a “customer side of the meter” issue because, unlike other loads, PEV is a storage device that could be operated as an integral component of electric grid management**
- **PEV charge management is essential to fully capture the benefits of charging PEV batteries with wind**



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**



Thank You

Larry.alford@austinenergy.com

512.322.6228