DOER Electric Vehicle Summit & Workshop

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EV Solutions

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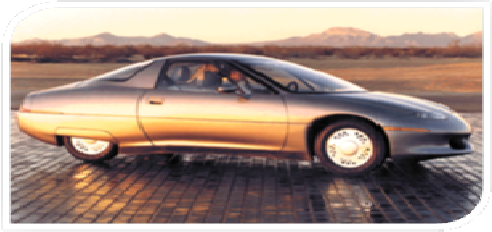
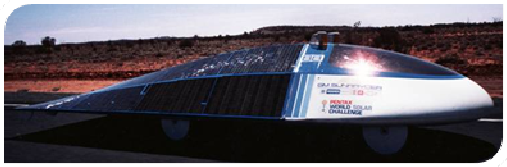
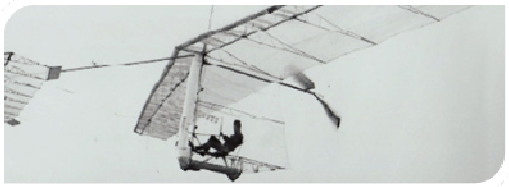
AeroVironment

Quietly Advancing Clean Transportation for 40 Years

- **AV develops, manufactures, and markets Efficient Energy Systems and Unmanned Aircraft Systems**
- **A unique record of achievement**
  - Industrial PosiCharge™, market-leading **industrial EV charging system**
  - Leading provider of **testing and simulation systems** to EV, PHEV, and advanced battery and fuel cell developers
  - Seven vehicles in the **Smithsonian**
  - Conceived and developed the GM Impact, the **first modern EV**
  - Helios Solar Airplane, **world altitude record holder** at nearly 100,000 feet
  - Global Observer, first **liquid-hydrogen powered** unmanned aircraft system







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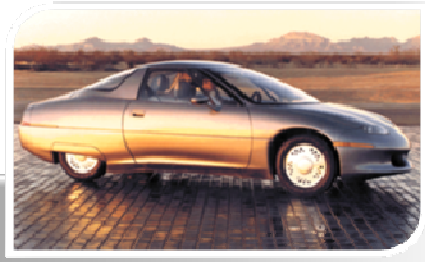
AV and Our Role in the Revolution

1989

The first modern EV



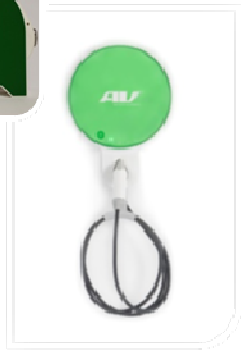
"Gen 1"
Public EV Chargers

EV Testing and Simulation

Industrial EV Charging

Fleet EV Solutions

2010



Home Charging Solutions

"Gen 2"
Public EV Fast Chargers

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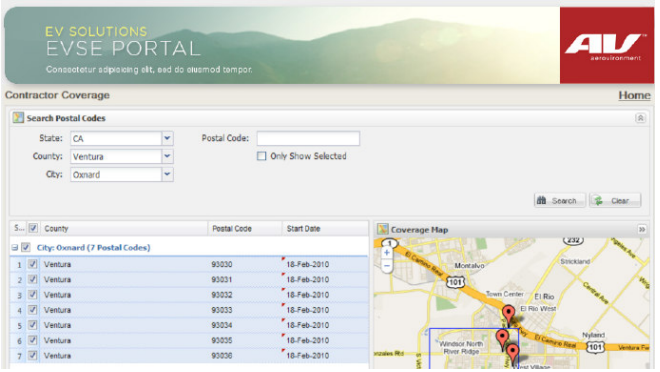
The EVSE Total Package

End-to-End Solutions That Address Every Need

- **The Hardware: Full Suite of EVSE Products**
  - For the home…
  - For smart grid…
  - For electrified fleets…
  - For public deployment…
  - For apartments, condos, dealerships…
  - Private-Label or Co-Brand Ready Solutions.
- **The Software**
  - Customizable EV DATA package
  - Patented smart-grid communication technology
- **The Services**
  - Application studies
  - Site assessment and permitting services
  - Installation services
- **The IT Infrastructure**
  - Web-based, customizable customer portal
  - Quoting, e-commerce, record management, CRM
  - Plugged into installer network and supply chain ERP



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The EVSE Hardware

Application Breadth, Functionality Depth

Home

Smart Home

Dealerships

Fleets, public, long-dwell retail

EVSE-RS
Base EVSE configuration
Wall or pedestal mount
Indoor or outdoor
Single-phase up to 30A
1 comm module option

EVSE-LS
All the functionality of RS
Up to 3 comm modules
(WiFi, Zigbee, Ethernet
Powerline, Cellular)

EVSE-Multi
Dual configuration
Quad configuration
All functionality of RS
Reduced install cost
Weather resistant

EVSE-CS
Commercial outdoor
Fleets and public charging
POS and cord security
Adaptable 3-phase input
Comm options

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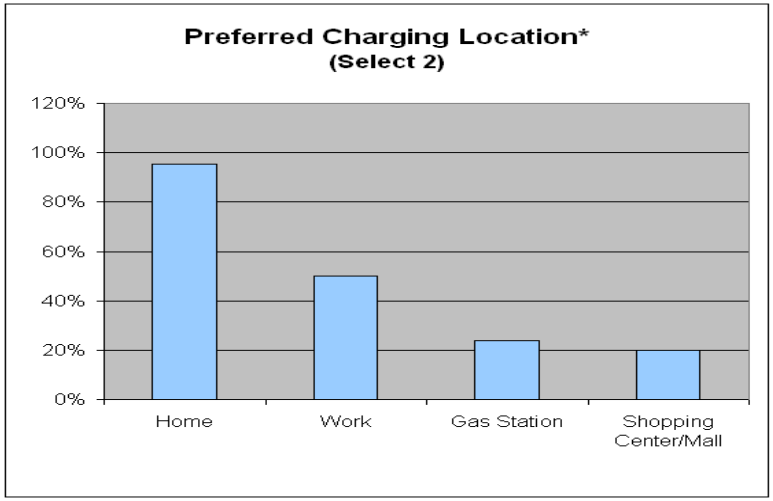
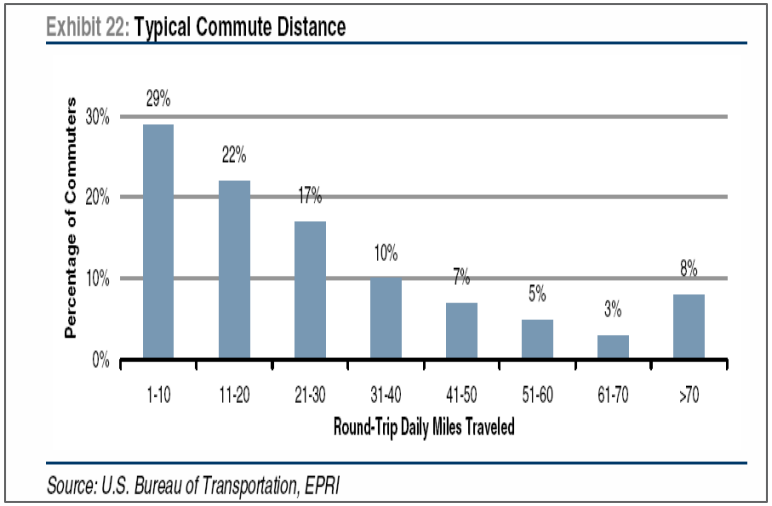
Most EV Charging Will Be Done at Home



- **95% of customers prefer home charging (EPRI Report)**
- **78% of US drivers commute less than 40 miles per day; 85% less than 50 miles**
- **Convenient, easy-to-understand process to install home charging will encourage more early EV adoption than public infrastructure (PlaNYC Report)**



*References:

"Electric Vehicles: Characterizing Consumers' Interest and Infrastructure Expectations," Final Report, Nov 2009. EPRI / Southern California Edison

"Exploring Electric Vehicle Adoption in New York City," January 2010 PlaNYC / McKinsey & Company

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The EVSE Services

End-to-End Support for All Your Home Charging Needs

- **The Team**
  - Trained, experienced and exclusive installers/service providers
  - Licensed electricians
  - Guaranteed availability
  - Local codes/permitting knowledge
- **The Installation Services**
  - Site assessments and application services
  - Service upgrades (trenching, panel upgrades)
  - EVSE installation
  - Complimentary on-site user training
- **The Post Installation Services**
  - Call center and help desk support
  - Warranty for parts and labor
  - On-site troubleshooting
  - Proprietary service tool for easy vehicle simulation and troubleshooting (EVSE v. vehicle v. utility service)

NATIONWIDE NETWORK

Proprietary troubleshooting tools & services

Certified technicians

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The IT Infrastructure

Front-and Back-End Infrastructure Waiting for You to Plug In

- **The Users**
  - Consumers/drivers
  - Your management team
  - AV certified installation/service network
  - AV forward and reverse logistics
  - Dealers and other 3rd party partners
- **Functionality**
  - User appointment scheduling
  - Automatic service provider assignments
  - User profile repositories
  - Purchase tracking
  - Private label or co-brand ready
  - E-commerce
  - Full, rich CRM capability
- **Service Level**
  - 24/7 uptime and site availability
  - Advanced security; password encryption, security layer
  - Triple redundancy protection against force majeure

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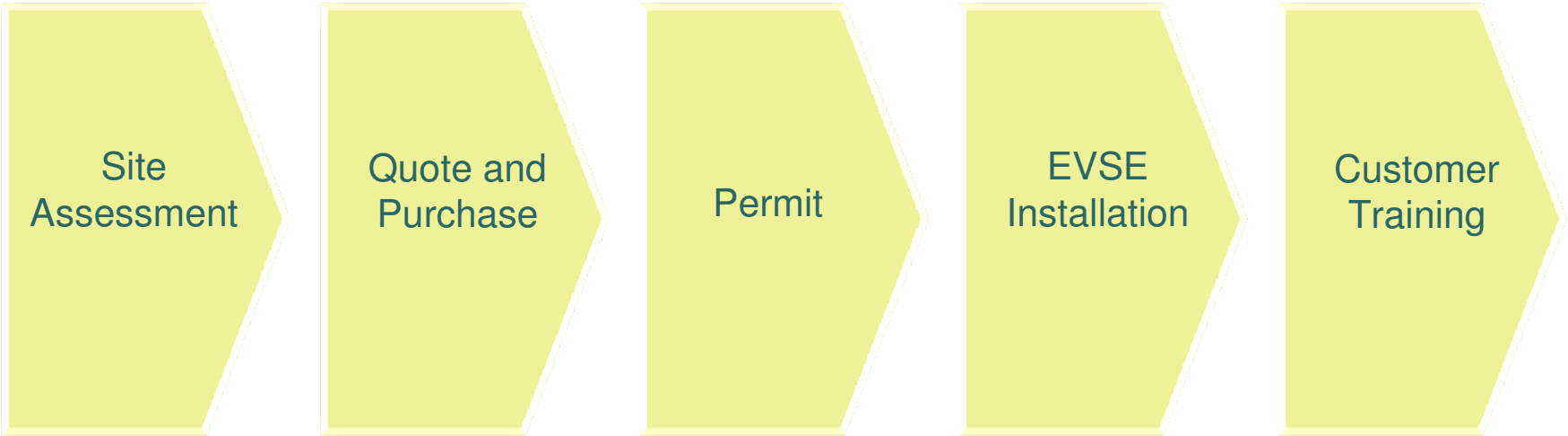
The EVSE Installation Process

Seamless User Experience



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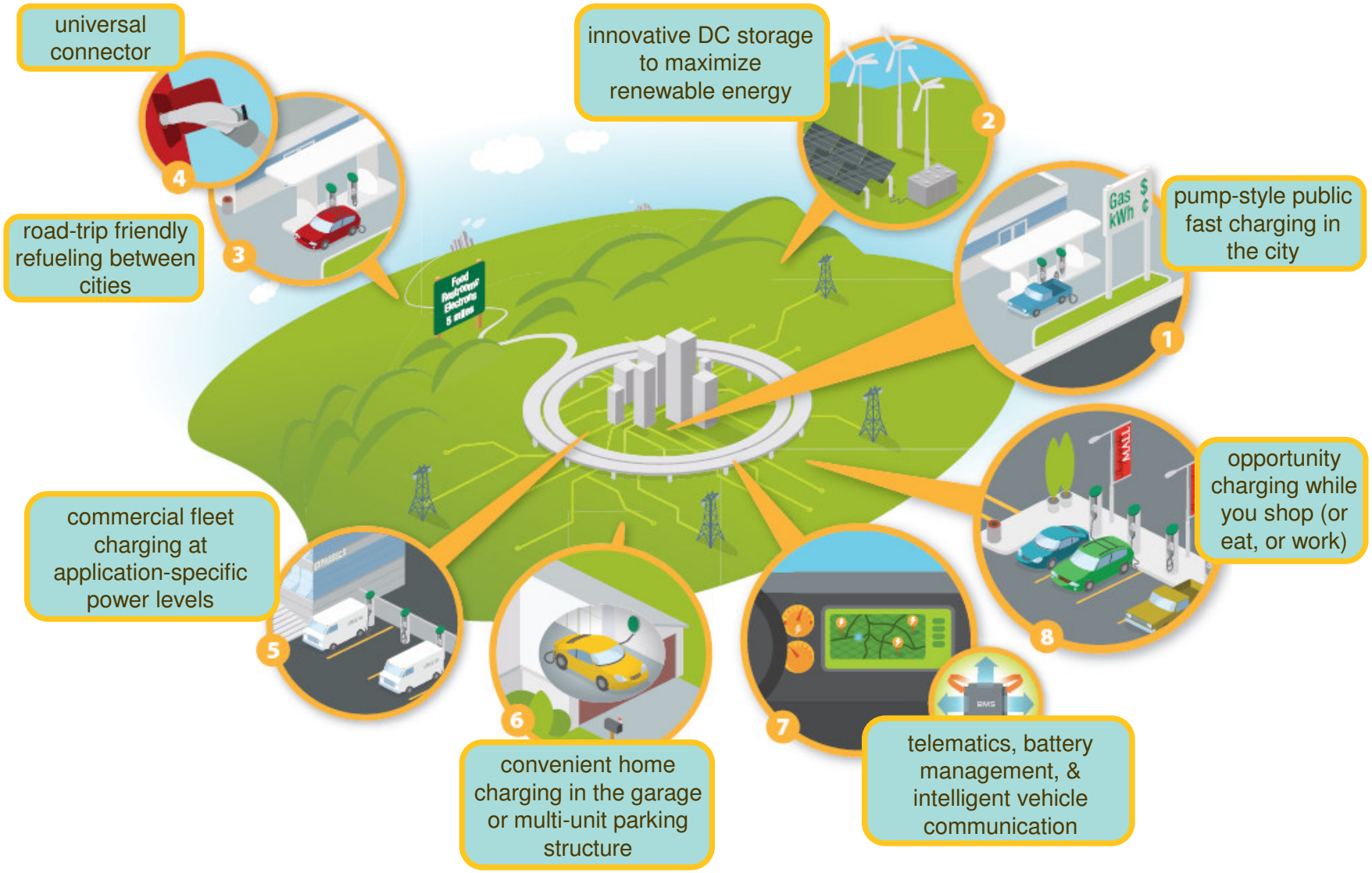
Building Out the Ecosystem

Home EVSE is Just the Beginning



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The Power of Practicality

Level 3 DC Infrastructure: The "Killer App" Enabling EV Adoption

- **The Benefits**
  - Supports planned long road trips as well as in-city "emergencies"
  - Charging in minutes, not hours
  - Supports large-batteries (buses, trucks)
- **The Features**
  - High power configurations
  - Bidirectional power capabilities
  - Tepco/JARI compatible
  - UL, CSA, CE by time of launch
  - ADA compliant
  - Advertising revenue opportunities
  - Full color GUI and POS options on public model
  - Customizable for private label branding opportunities
- **The Offering**
  - "PS" models for public use
    - 10kW, 30kW, 60kW, 125kW, 250kW
  - "FS" models for low-cost, high-impact fleet use
    - Same power levels

Iconic Public Charger
Communication options
Full-color GUI
POS options

Fleet Charger
Simple GUI
Cable management
Cable security
Lower-cost

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Questions

Thank you

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