CEC Mission

Clean Energy Coalition is a nonprofit, nonpartisan organization dedicated to promoting clean energy technologies as a way to create healthier, energy independent communities.

How We Accomplish Our Mission
CEC implements, manages, and evaluates cost effective, market transformation projects and programs in the building and transportation sectors.
Clean Cities

A U.S. Department of Energy initiative with the mission to advance the environmental, economic, and energy security of the U.S. by supporting local decisions to adopt practices that contribute to the reduction of petroleum consumption in the transportation sector.
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Clean Cities Research Partners
Alternative Fuel and Advanced Technology Infrastructure
U.S. Alt. Fueling Stations by Type

Number of Stations

1992

2012

Electric*
Propane
Methanol (M85)
LNG
Hydrogen
Biodiesel**
CNG
E85

bridging needs, advancing change.
Biofuels
U.S. Biofuel Station Growth Rates

**Ethanol**

- 2012 Stations: 2,553
- 4-year annual rate of change: +8%

**Biodiesel**

- 2012 Stations: 675
- 4-year annual rate of change: >1%
Biofuel Industry Trends

- $1.00 per gallon *biodiesel blender credit* (inconsistent)

- $0.45 per gallon *ethanol blender credit* (inconsistent)

- Few operators have demonstrated significant *economic savings*

- **Competitive pressures**
  - CNG/LNG/Electric/Hybrid
  - 2007 & 2010 diesel vehicles have become significantly cleaner

- **Performance challenges**
  - Cold start-up/gelling (biodiesel)
  - Fuel economy (ethanol)
Natural Gas
2012 Stations: **1,107**
4-year annual rate of change: **+ 11%**

2012 Stations: **59**
4-year annual rate of change: **+ 16%**
Nat. Gas Industry Trends

• Somewhat dependent on $0.50 alternative fuel excise tax credit

• **Market is fleet driven**: several operators are demonstrating **significant economic savings** (current CNG price in MI is $2.19 per GGE)

• **Emissions savings** compared to existing diesel technology
  – Far Less NOX
  – Less GHG but almost double CO

• Some engine manufacturers are investing in new technologies
  – Cummins 8.9L & 12L, Dodge RAM
CNG Stations in Michigan

13 CNG stations in Michigan
Excluding private stations

Download spreadsheet of matching stations
Propane Autogas
2012 Stations: **2,654**
4-year annual rate of change: **+ 2%**
Propane Autogas Industry Trends

- Somewhat dependent on $0.50 alternative fuel excise tax credit

- **Market is fleet driven**: several operators are demonstrating **significant economic savings** (some fleets are paying as low as $1.20 per GGE)

- **Emissions savings** compared to existing gasoline technology
  - Less GHG
  - Less NOX

- OEMs are partnering with aftermarket
  - GM & IMPCO
  - Ford: gaseous prep for QVMs
Electric Vehicle Supply Equipment (EVSE)
U.S. EVSE Growth Rates

2012 Stations: 13,392
4-year annual rate of change: + 695%
What’s Behind the 695% Increase?

Approximately $115M to install EVSE in 14 cities
What’s Behind the 695% Increase?

Approximately $15M to install EVSEs in 10 regions
U.S. EVSE Trends

- Residential charging equipment will be the leading segment in the United States, with 57% of unit sales in 2011 falling to 49% in 2017.

- By 2017, Michigan is expected to be ranked 12th for EVSE sales nationwide, with 10,500 units that year.

*Top 15 States for Annual EVSE Sales: 2017*

- California
- New York
- Florida
- Texas
- Illinois
- North Carolina
- New Jersey
- Massachusetts
- Arizona
- Washington
- Pennsylvania
- Michigan
- Virginia
- Oregon
- Colorado

(EVCE Sales)
The Detroit MSA ranks 13th among U.S. cities for PEV sales, reaching 7,300 annual sales by 2017.

Within the Detroit MSA, Pike Research expects by 2017 there will be 33,400 PEVs on the road.

This area’s heavy presence of automotive companies and consumer acceptance of “green” vehicle technologies are the biggest drivers for early PEV growth.

PEVs account for 2% of Michigan sales in 2017.
Zip Codes with Bosch EVSE Installs
U.S. EVSE Growth Rates

Bosch EVSE Installations by 3-digit ZIP code (first three digits)
Residential Energy Incentive Program

Installs by ZIP Code
- = One Installation

This dot density map shows the exact number of EVSE installations, randomly sorted by ZIP code. It gives an approximate idea of the geographic spacing of DTE Incentive Program installs.
Michigan DTE EVSE Installations

Installs by ZIP Code
- = One Installation

Most Installations
West Ann Arbor: 64 (48103)
North Rochester Hills: 35 (48306)
Gross Pointe Shores: 33 (48236)
South Macomb: 31 (48044)

DTE Energy
bridging needs, advancing change.
Electric Vehicle Industry Trends

- Vehicle sales may be dependent on **$7,500 tax credit** and 30% infrastructure tax credit

- **Market is consumer driven**: OEMs are primarily targeting consumers. Vehicles are most often charged at private residences.

- **Emissions savings** is dependent on how local power is generated (66% coal in Michigan)*

- More than 16 OEM offerings and counting

*2009 U.S. EPA eGRID2012 Version 1.0
Michigan Funded Infrastructure Projects
Overview

1. Funded by U.S. Department of Energy Biomass Program
2. Partner with Corn Marketing Program of Michigan
3. $200,000 total funding

Objective: Install 10 E-85 pumps at existing Michigan public service stations.
Michigan Green Fleets (ARRA)

Clean Cities Recovery Act Awards Geographical Distribution

Many awards involve regional or multi-state projects and may not be limited to the state of the grantee.
Overview
1. 4-year project
2. $14.9M total funding
3. ~500 alternative fuel vehicles
4. ~60 alternative fueling stations
5. Anticipate 1.7M gallons annually of petroleum displaced

Objective: Expand the use of alternative fuel and advanced vehicle technology and infrastructure throughout Michigan.
Michigan Green Fleets

Infrastructure:
- CNG: 5
- EV: 16
- HEV: 40

Vehicles:
- CNG: 204
- EV: 254
- HEV: 11
- HHV: 36
- LPG: 12

CNG$ EV$ HEV$ HHV$ LPG$
Sub Recipients

**Government**
- Ann Arbor Downtown Dev. Authority
- City of Ann Arbor
- City of Detroit

**Industry**
- DTE Energy/MichCon
- FedEx Ground
- Frito Lay
- Great Lakes Transportation, LLC
- Schwan’s Home Service
- UBCR, LLC
- Wright & Filippis

**Higher Education**
- -- University of Michigan
- -- Western Michigan University
Research & Planning: DOE

Situation:
Patchwork of local ordinances, codes, and permitting requirements

Opportunity:
Develop PEV adoption guide for Michigan municipalities

Solution:
Plug-In Ready MI Plan
Signage

Figure 4.1 - Auburn Hills' electric vehicle parking sign design

Figure 4.2 - Auburn Hills pavement stencil

Figure 6E.2: Warning Sticker
Site Planning

ADA

NOTES:
The best location for the dual vehicle EVSE unit would be between an accessible parking space and an EV parking space. Installation application: The location of the EVSE unit should be placed to allow for an unobstructed accessible route from the accessible space to the building entrance.
Site Planning

Parallel On-street

NOTES:
The best location for the EVSE unit would be at the end of on-street parking spaces. Installation application: the location of the EVSE unit should be a minimum of 24 inches from the face of the curb, otherwise, bollards should be used to protect the unit from damage. The EVSE unit should not prohibit sidewalk use and should allow a minimum 4 foot walking path at the location of the EVSE unit.

ON-STREET PARALLEL PARKING INSTALLATION
Site Planning

Angled On-street

NOTES:
The best location for the EVSE unit would be between two parking spaces designated for EV parking. Installation application: the location of the EVSE unit should be a minimum of 24 inches from the face of the curb. Othwalite, barriers should be used to protect the unit from damage. The EVSE unit should not impair sidewalk use and should allow a minimum 4-foot walking path at the location of the EVSE unit.
Public Parking

RANGE
R = 10

PARKING LOT INSTALLATION
RETROFIT:
EXTEND CONDUIT ALONG BACK OF CURB. EXTEND ENTIRE LENGTH OF BAY FOR FUTURE UNITS. POSSIBLE SLEEVE UNDER DRIVE AISLES TO PARKING ISLANDS TO DISPERSE UNITS THROUGHOUT LOT.

EV CHARGING STALL
BOLLARD PROTECTION (IF REQUIRED)
PEDESTAL MOUNTED CHARGING STATION
Parking Garage

Notes:
The best location for the EVSE unit would be between two parking spaces designated for EV parking. Installation application: the location of the EVSE unit should be placed behind parking blocks and/or bollards to protect the EVSE unit.
Thank You!

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