Toolkit Development

October 15, 2015

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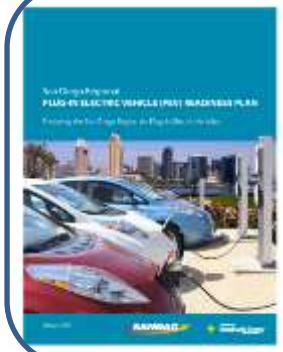
Center for Sustainable Energy™

How did we get here?

2009
SANDAG Regional Alternative Fuels, Vehicles, and Infrastructure Report

2011-2013
Plug-in Electric Vehicle Planning/REVI



Fall 2014
Kick-off of Alternative Fuel Readiness Project

Fall 2014
Creation of Refuel

Spring 2015
Development of San Diego Alternative Fuel Assessment

July 2015
Kick-off of Plug-in SD

Summer 2015
Development of Alternative Fuel Toolkits

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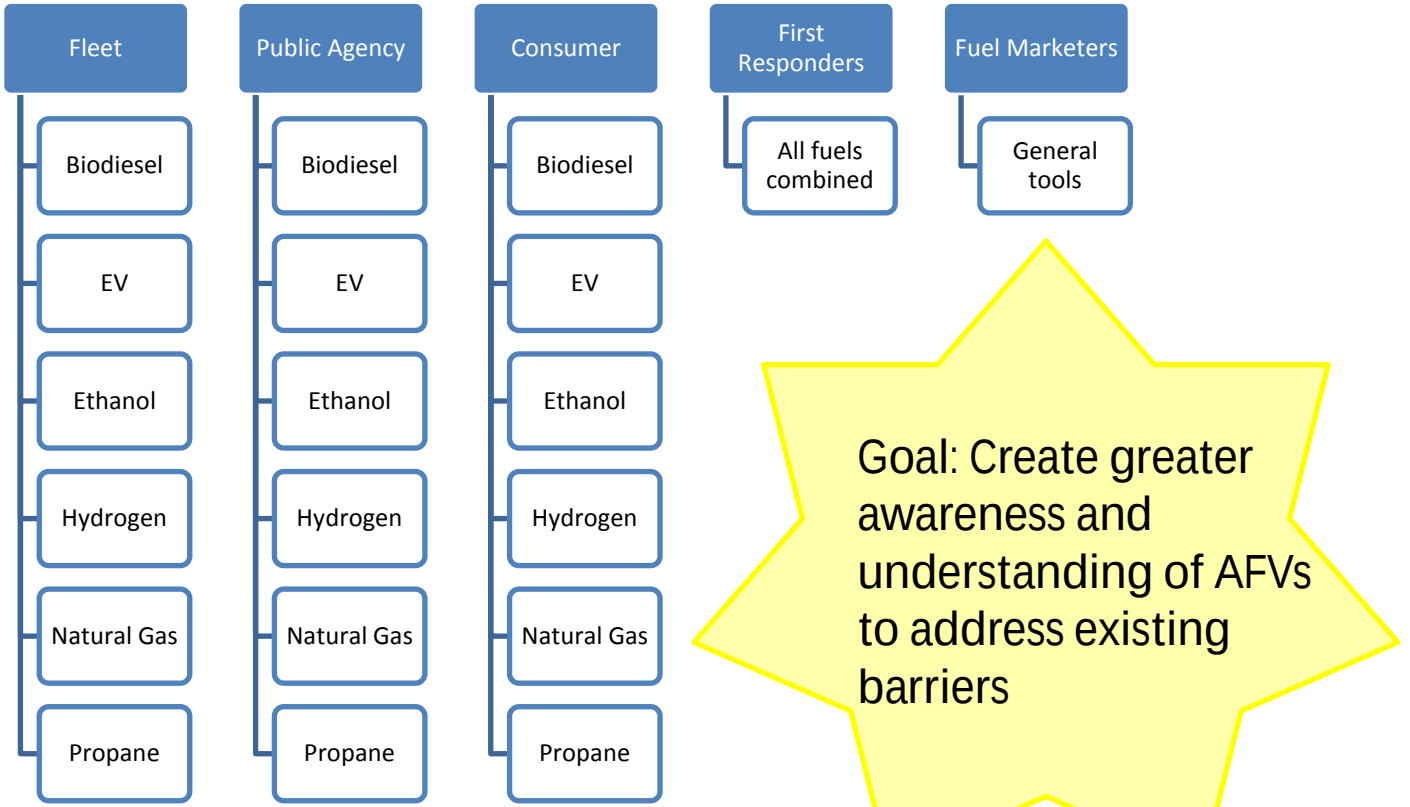
What is a toolkit?

Wants to inform select audiences about alternative fuel vehicles and infrastructure



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Toolkits: A Glance

This toolkit was developed as part of the San Diego Regional Alternative Fuel Readiness Plan with support from the San Diego Regional Alternative Fuel Coordinating Council (Refuel), which seeks to reduce barriers to alternative fuel adoption in the region.

As California works toward achieving its ambitious climate goals, transitioning from gasoline and diesel vehicles into alternative fuel vehicles is an important facet in lowering greenhouse gas emissions (GHG).

In the San Diego region, several public agencies and municipalities are taking the lead in developing strategies and goals to include alternative fuel vehicles into their policies. Many jurisdictions have noted alternative fuels as a key substitute to conventional fuels in their Climate Action Plan (CAP) or other planning or fleet management policy document.

Among the several planning documents available and developed by jurisdictions, there are key strategies that are prevalent among them all, including:

- Replacing vehicles in government and contractors' fleets with alternative fuel vehicles
- Increasing the number of alternative fuel stations available for the public
- Increasing the number of alternative fuel vehicles in government fleets
- Streamlining permitting for alternative fuel infrastructure

How do I use this toolkit?

This toolkit provides resources that public agencies have identified as being desirable for further training and assistance in the transition into alternative fuel vehicles. This includes:

- Guidance on availability of funding for alternative fuel vehicles and infrastructure installation projects;
- Case studies of jurisdictions or private fleets that use alternative fuels; and
- Fact sheets or reference guides on general information about alternative fuels.

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What is the value of alternative fuels?

Alternative fuel vehicles offer long-time cost savings and can have the same performance quality of conventional vehicles, but without the air pollution that comes with them.

Policies for the acquisition of alternative fuel vehicles may already be in your organization's larger long-term energy or Climate Action Plan. A majority of municipalities and public agencies throughout the San Diego region have already referenced the increased procurement of alternative fuel vehicles as a way to reduce greenhouse gas (GHG) emissions and to support the State's climate goals.

Not only are local governments thinking about alternative fuels, there are several state-level policies and strategies that promote the increased use of them.

How do I use this toolkit?

This toolkit includes resources identified by fleet managers for further training and assistance in the transition to alternative fuel vehicles. The toolkit includes the following resources:

- Guidance on the available funding for alternative fuel vehicles and infrastructure installation projects
- Fact sheets or reference guides on general information about alternative fuels
- Case studies of fleets that use alternative fuel

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Alongside public agencies, consumers can also begin to empower themselves with more knowledge about alternative fuel vehicles. This may encourage consumers to make more well-informed choices in their next vehicle purchase.

Driving an alternative fuel vehicle often has the following benefits:

- Cost savings
- Protection against petroleum price volatility and supply uncertainty
- Reduction of greenhouse gas emissions
- Improves local air quality
- Decreased reliance on foreign oil sources

How do I use this toolkit?
This toolkit provides resources and general information about alternative fuel vehicles for consumers. Within this toolkit, six different alternative fuels are discussed, detailing fuel-specific information such as:

- Guidance on availability of funding for alternative fuel vehicle purchases;
- Maps of public infrastructure locations;
- Diagrams of how an alternative fuel vehicle works;
- Fuel savings comparisons.

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Toolkits: A Glance

Fuel Marketers and Retailers

Why Alternative Fuels?

Alternative fuels are growing in use in California to meet the Governor's state goals.[1] In 2014, there were over 40,000 alternative fuel vehicles in the San Diego region alone. Further, there are over 3,750 fueling stations in California that offer alternative fueling options.

Alternative fuels include biodiesel (B20), compressed natural gas (CNG), ethanol (E85), electricity, hydrogen, and propane autogas (propane). They serve as more cost-effective and cleaner-burning options to conventional diesel or gasoline fuel. They also perform just as well as any conventional vehicle.

Installing alternative fuel infrastructure may not only increase the throughput of your fueling station, but it can also signal your commitment to the environment.

The state's commitment to alternative fuel includes several federal and state laws[2] and provides[3] that signal for the increase in alternative fuel use (below).

Helpful Resources for Fuel Retailers:

The California Energy Commission offers grant opportunities to fund the development of a variety of alternative fuel infrastructure. Visit http://www.energy.ca.gov/drive/fy.html to stay up-to-date with their activity.

Learn more about alternative fuels at the Department of Energy's Alternative Fuel Data Center (AFDC): http://www.afdc.energy.gov/

Fuel Marketers and Retailers 1

Propane

Before adding propane autogas to your retail fuel site, consider the following tips:

- Aboveground propane autogas tanks must be separated by at least 25 feet from tanks that dispense liquid or gaseous motor fuels
- Market the availability of propane autogas by using the tools found here: http://www.propanecity.com/Programs/Default.aspx?ProductCode=121
- Learn basic information about propane autogas as well as a discussion about the barriers to greater propane autogas adoption and solutions to these barriers: http://www.propanecity.com/Programs/Default.aspx?ProductCode=123
- Ensure you know how to safely use and maintain propane equipment: http://www.propanecity.com/safety-minute/

E85

Checklist for installing E85:

- How much E85 are other stations selling?
- Can you access low-cost E85 that is sold to a regional blender?
- Do you have a mid-grade tank or extra regular unleaded tank that can be converted?
- What is the estimated throughput for the E85 station?
- What incentives are available for the installation?
- Are gasoline or diesel sales are low? E85 may be a better selling item.

This information and more is found in the AFDC offers a study that creates a business case for selling the fuel: http://www.afdc.energy.gov/fuels/ethanol_business_case.html

Visit www.ethanolretailer.com to download Point of Purchase materials like curbside signs (example above) and nozzle talkers, as well as learn more about how to market E85 at your site.

Biodiesel

To market and sell biodiesel, obtaining BQ-9000 accreditation is the best way to show your product is maintained at the industry standard. ASTM D6751 and also helps promote public acceptance of biodiesel. Learn more about the accreditation at: bq-9000.org

As a biodiesel retailer, remember the key points:

- Biodiesel blends will work in any diesel engine without the need for modifications
- Blue provides similar horsepower, torque, and mileage as diesel

The Department of Energy has developed Handling and Use Guidelines for Biodiesel that is found here: http://energy.gov/eere/vehicles/articles/handling-biodiesel-and-use-pdf

CNG

When planning to open a CNG station, consider the following points:

- Will you own the station?
- What type of fuel delivery service will you offer: time-fill, fast-fill, or a combination?
- Who will maintain and operate the station?
- Who can access the station (public, private)?
- How will the station be funded, and how to charge for fuel?

All of this is addressed in NGV America's guide on CNG station business models: http://www.ngvamerica.org/publications/station-business-models/

Hydrogen

Hydrogen fueling can typically be added to an existing fueling station; most likely gasoline or natural gas. Hydrogen fueling equipment includes a dispenser, storage tubes, and a compressor. These are basic guidelines to add hydrogen to your station:

- Determine your eligibility – visit the Alternative Fuel Data Center to ensure that your space can accommodate the infrastructure: http://www.afdc.energy.gov/fuels/hydrogen_infrastructure.html
- Station location – ensure that your proposed station location is within a region that has been prioritized by the California Road Map[4] to increase your chances of receiving government funding.
- Partner with an experienced company
- Read more about hydrogen before initiating the infrastructure, make sure you understand the basics: http://cafcp.org/marketready

EV Charging

To host EV charging stations at your site, consider the following:

- Availability of power – can the site's electrical panel support the addition of EVCS? If not, is it easily upgradable? Is it case to a transformer if new service is needed?
- Functionality – how far are the potential EVCS spots from the electrical panel? Does the site require extensive trenching? Construction costs increase when significant trenching is required.
- Environmental protection – will the EVCS cause environmental harm to the site?
- Accessibility – will an EV drivers be able to access the charging station safely?
- Payment – will you require a fee for an EV drivers to access the charging station?
- Partners – hosts may either obtain and operate all EV charging stations on their own, or work together with an electric vehicle service provider (EVSP) who will maintain and operate the stations on behalf of the host.

More details about being a EVCS host can be found on the Clean Cities Guide: http://www.afdc.energy.gov/pdfs/51227.pdf

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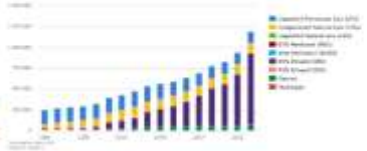
Toolkits: A Glance

This toolkit was developed as part of the San Diego Regional Alternative Fuel Readiness Plan with support from the San Diego Regional Alternative Fuel Coordinating Council (Refuel), which seeks to reduce barriers to alternative fuel adoption in the region. Emergency personnel are one of the sectors for which a toolkit has been developed. Alternative fuel vehicles (AFVs) are becoming more prevalent in the San Diego region.

There has been a big growth of alternative fuel vehicles in the San Diego region. Each year, more and more light-duty AFVs are being purchased in the region, especially in the electric vehicle (EV) space. As of September 2015, there are upwards of 17,500 electric vehicles on San Diego's roads. The chart below shows the growth of AFV use in the United States.

Alternative Fuel Vehicles in Use



Source: Source: Energy Information Administration's Alternative Fuel Vehicle Data

How do I use this tool kit?

This toolkit provides resources and guidance that inform emergency personnel about available training and educational material and events for handling alternative fuel vehicles.

Through the resources provided in this toolkit, first responders and emergency personnel should be able to:

1. Familiarize themselves with alternative fuels
2. Understand potential hazards unique to individual alternative fuels
3. Safely respond to an incident in which an alternative fuel is present

Why Emergency Personnel Training?

What Training Resources are Available?

Fuel-Specific Training

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Outreach

Subcommittees

- Gaseous Fuels (June 11)
- Biofuels (July 9)
- Electric Drive (Aug. 28)
- Hydrogen (Sept. 15)

External Stakeholder Meetings

- South Bay Energy Action Collaborative
- Fleet Manager Roundtable
- Energy Working Group
- Regional Technical Working Group

One-on-Ones

- New Leaf Biofuel
- EXPO Propane
- San Diego Airport
- Others

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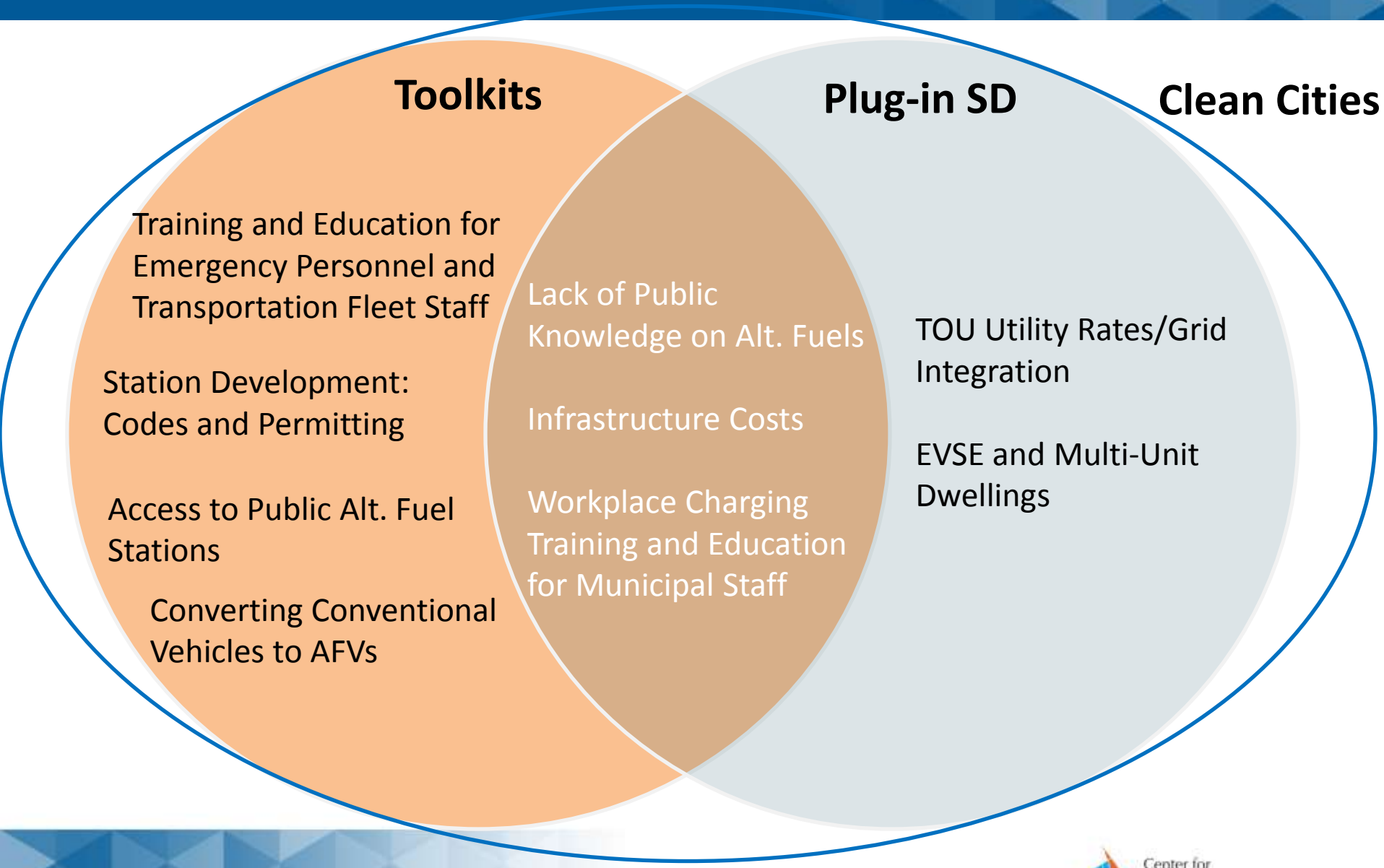
Barriers Addressed



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Topics for Plan and Future

Alternative Fuel Readiness Plan

Topics from Toolkits

Alternative Fuel Technology: Future technological and fuel advancements

Alternative Fuel "Expert"?

Station Development: Site Assessment

San Diego Clean Cities Coalition/ Southern California Advanced Transportation Center will provide support for all these efforts.

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Since the project began…

Two new CNG stations (EDCO) added

More EV Charging Stations

Three more E85/Ethanol Stations to be added in 2016

Two new renewable diesel stations

Growing interest in hydrogen, plus hydrogen station to be added 2016

Fuel prices

Ultra low NOx from new CNG technology

Next Steps/Moving Forward

- Is there something missing that would be helpful?
- We're anticipating CEC funding for alternative fuel implementation work in the future.
  - How do we make it "implementation friendly"?
- How do we get these toolkits used regularly?
- How to support diverse needs of jurisdictions?

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