

refuel



San Diego Regional Alternative Fuel
Coordinating Council

Refuel: San Diego Regional Alternative Fuel Coordinating Council

Kick-off Meeting
October 16, 2014

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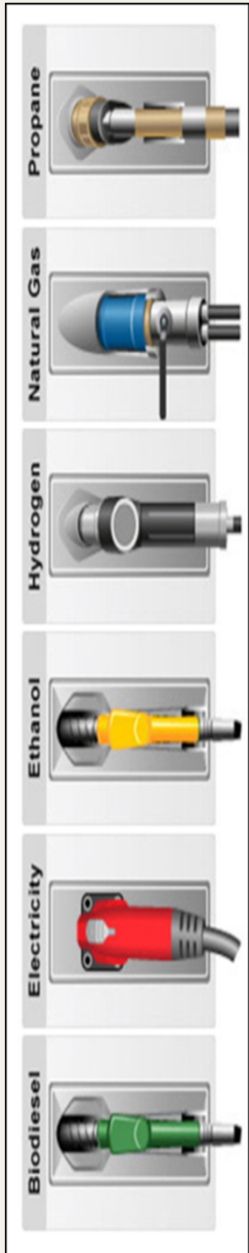
San Diego Regional Alternative Fuel
Coordinating Council

Item 3

California Energy Commission Grant Requirements

Why are we here?

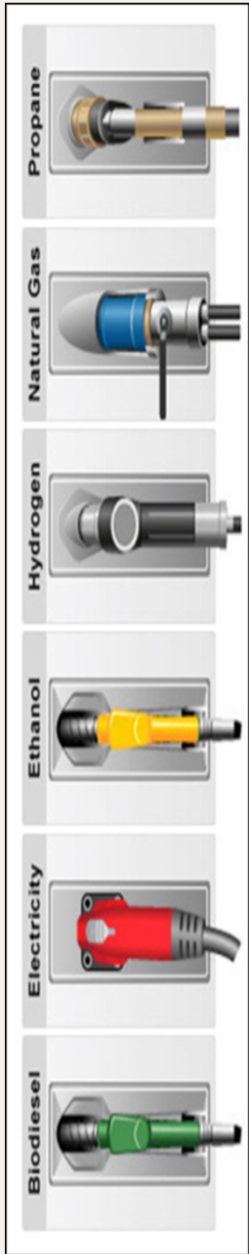
- Energy Commission Grant
 - 2 year award
 - \$360,040
 - Continue & expand efforts under REVI
 - Further deployment of AFV and AFI
 - Help region achieve energy and climate goals



Who we are

Refuel Partners:

- SANDAG: *San Diego Association of Governments*
- SDRCCC: *San Diego Regional Clean Cities Coalition*
- SDCAPCD: *San Diego County Air Pollution Control District*



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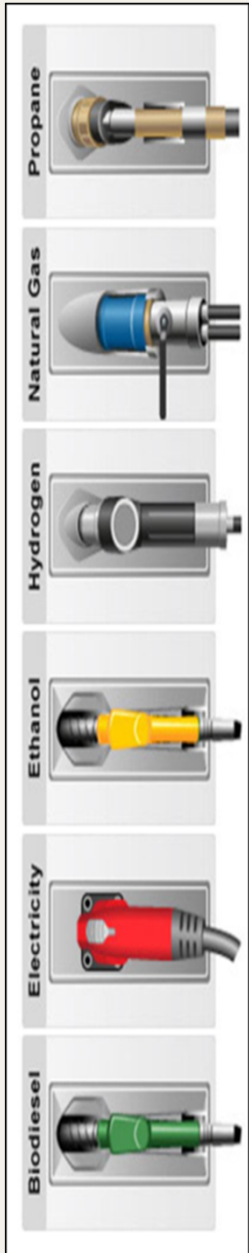


San Diego Regional Alternative Fuel
Coordinating Council

Item 4

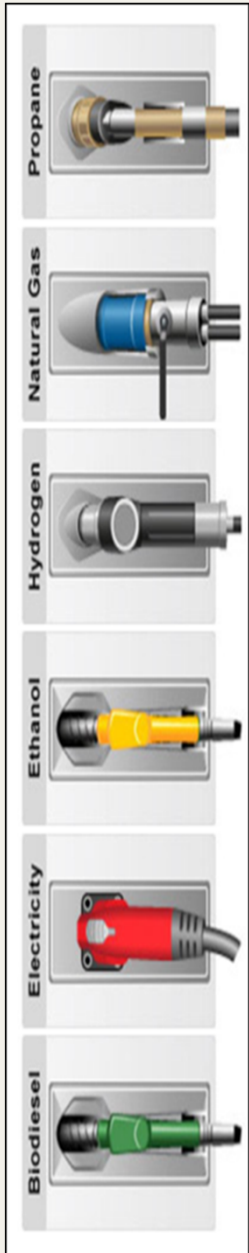
Introduction to Refuel: San
Diego Regional Alternative Fuel
Coordinating Council

Refuel: Introduction



- San Diego Regional Alternative Fuel Coordinating Council
- Diverse stakeholders
 - Local and regional government
 - Public agencies
 - Utility
 - Education and research institutions
 - Industry
 - Regional
 - Fuel
 - Vehicle

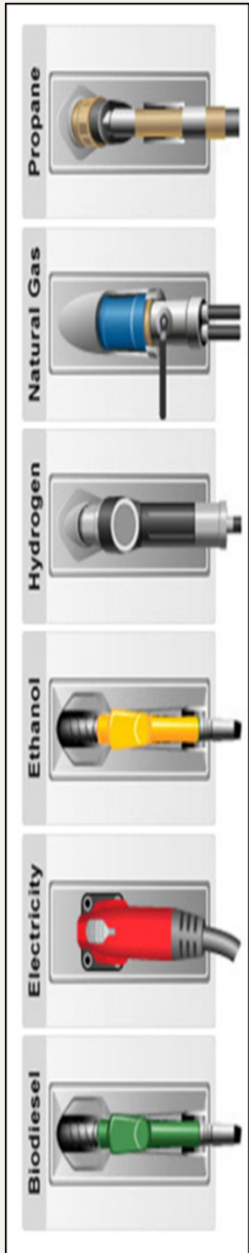
Refuel: Project Overview



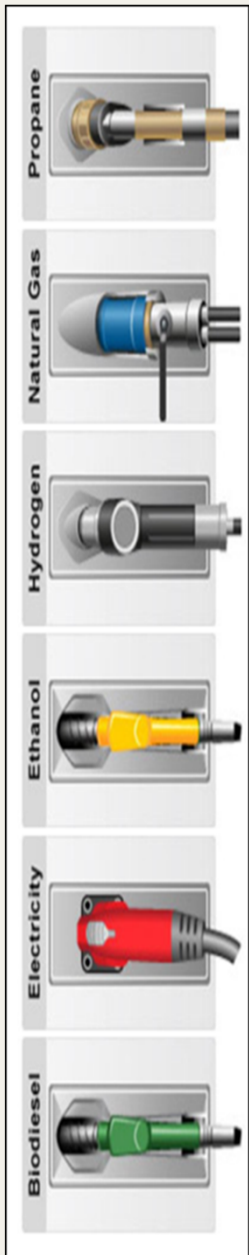
- Assess the current state of alternative fuels in the region
- Identify alternative fuel training, infrastructure, policy, and funding gaps
- Create sector-specific toolkits to provide resources to key stakeholders in alternative fuel readiness
- Address the identified needs and challenges in the San Diego Regional Alternative Fuel Readiness Plan

Refuel: Alternative Fuels

- Alternative Fuels Overview
 - Electricity
 - Hydrogen
 - Gaseous Fuels
 - Biofuels



Electricity and Hydrogen



Electricity



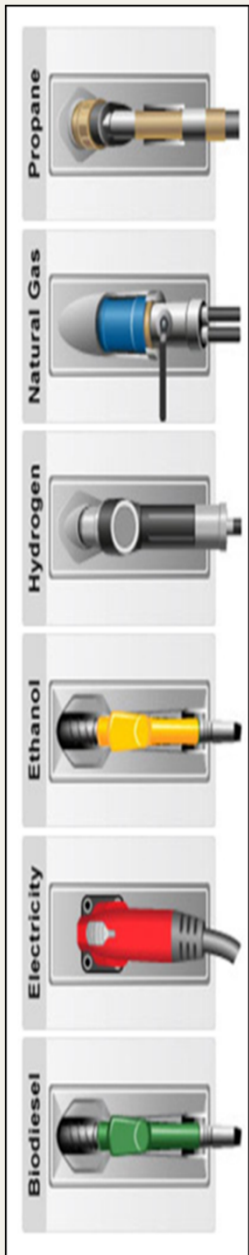
- Vehicle types
 - Plug-in hybrid electric
 - Battery electric
- Vehicles use energy stored in a battery and must be charged externally (i.e. plugged-in).
- Majority of vehicles are light-duty.

Hydrogen



- FCVs turn hydrogen and oxygen into electricity to power an electric motor.
- H₂ is stored onboard vehicle in high pressure tanks.
- H₂ is produced by reformation or electrolysis.
- Currently limited infrastructure and vehicle models.

Gaseous Fuels



Natural Gas



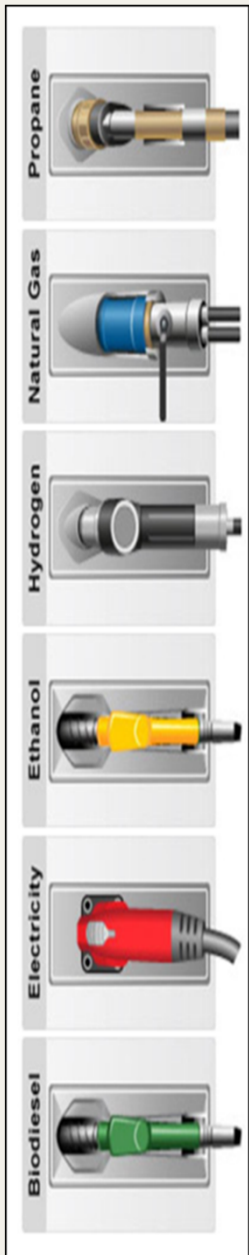
- Mixture of hydrocarbons, primarily methane.
- Stored onboard vehicles in either a compressed gaseous or liquefied state.
- Natural gas vehicles are available in sedans to heavy-duty vehicles.

Propane



- Produced from natural gas processing and crude oil refining.
- Stored onboard vehicles as a liquid at moderate pressure.
- Commonly available propane vehicles: light and medium-duty trucks, vans, and shuttle buses.

Biofuels



Ethanol



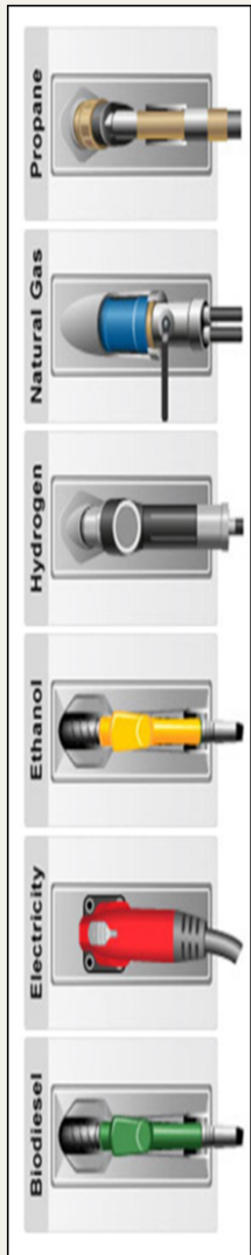
- Domestically produced alcohol-based fuel.
- Derived from various plant materials including corn, sugar cane, and grasses.
- Flexible fuel vehicles can operate interchangeably on gasoline and E85.

Biodiesel



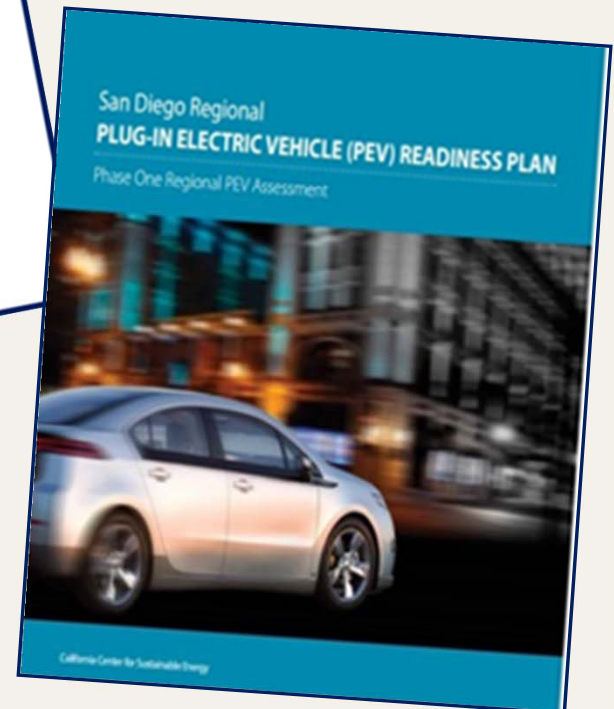
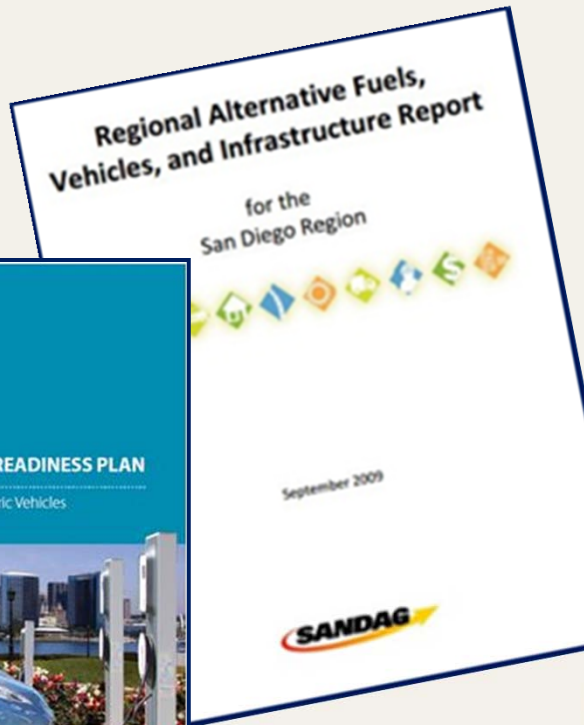
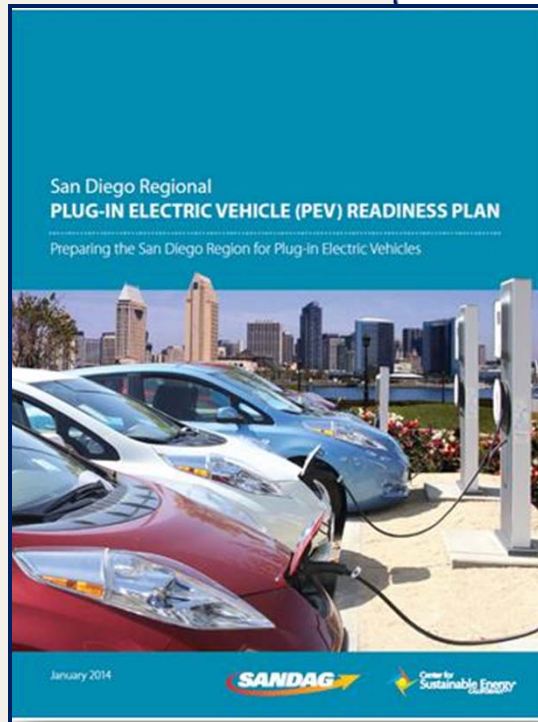
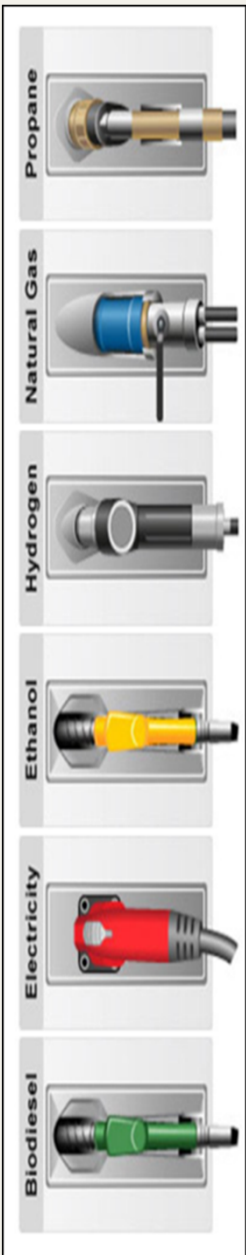
- Manufactured from vegetable oils, animal fats or recycled restaurant greases.
- Biodiesel blends range from B5 to B99.
- Unmodified diesel engines can run on any biodiesel blend.

Potential Alternative Fuel Fleet Applications

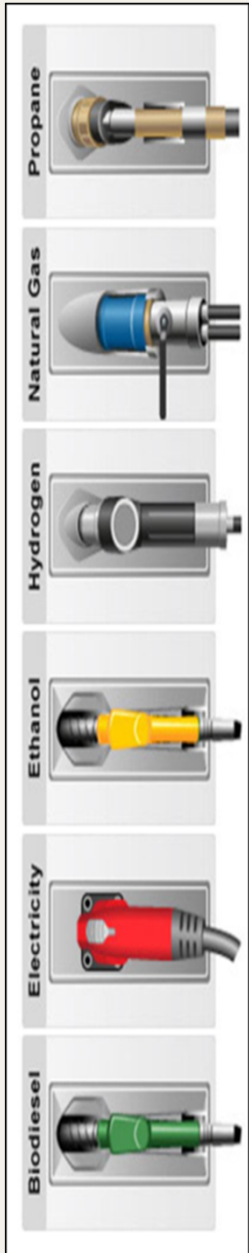


Fleet Application ¹	Biodiesel	Electricity	Ethanol (E85)	Hydrogen	Natural Gas	Propane
Passenger Vehicle	B5	PHEV, BEV	FFV	FCV	CNG	LPG
Vanpool-Shuttle	B20	PHEV	FFV	--	CNG	LPG
Pickup Truck	B20	PHEV	FFV		CNG	LPG
School Bus	B20	--	--	--	CNG	LPG
Sweeper	B20	--	--	--	CNG, LNG	--
Other Medium Duty	B20	BEV, HEV	--	--	CNG, LNG	LPG
Refuse Hauler	B20	HEV	--	--	CNG, LNG	--
Transit Bus	B20	BEV, HEV	--	--	CNG, LNG	--
Regional/Long Haul Truck	B20	--	--	--	CNG, LNG	--
Forklift	--	BEV	--	FCV	CNG	LPG
Lawn/Landscape mower	B20	--	--	--	--	LPG
Low-speed Vehicle ³	--	NEV	--	--	--	LPG

Previous Alternative Fuel Planning Efforts

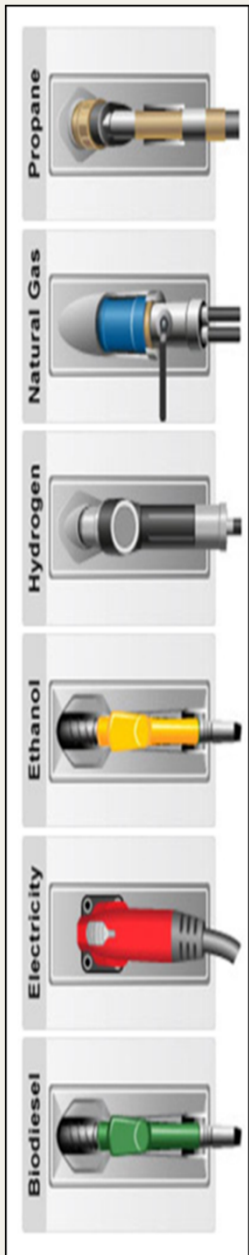


Refuel: Deliverables



- Deliverables
 - Alternative Fuel Coordinating Council
 - Alternative Fuel Assessment
 - Sector Specific Alternative Fuel Toolkits
 - Regional Alternative Fuel Readiness Plan

Refuel: Timeline

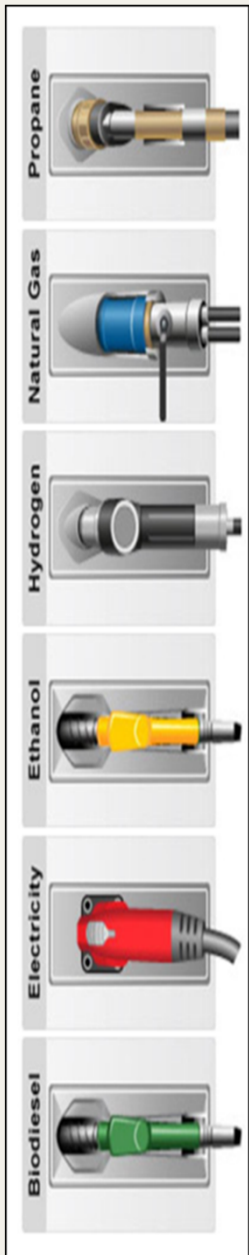


- Quarterly meetings
- Readiness Assessment
 - Survey
 - Existing Conditions Report
 - Alternative Fuels Assessment
- Toolkits
 - Sector-specific toolkits
 - Outreach and distribution
- Regional Alternative Fuel Readiness Plan

Refuel:

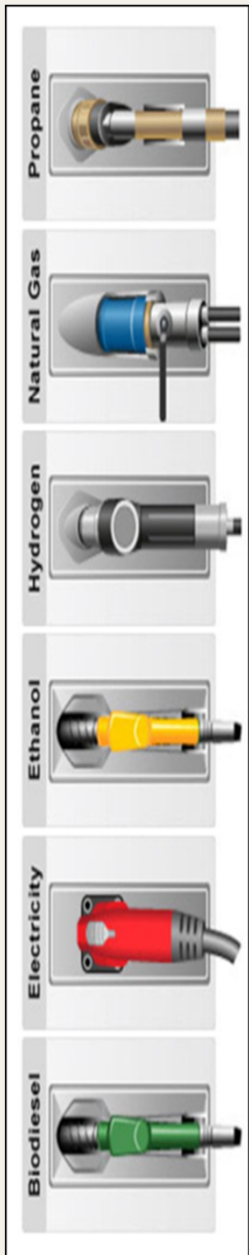
Quarterly Meeting Schedule

1. October 16, 2014 – Kick-off
2. January 15, 2015
3. April 16, 2015
4. July 16, 2015
5. October 15, 2015



Refuel:

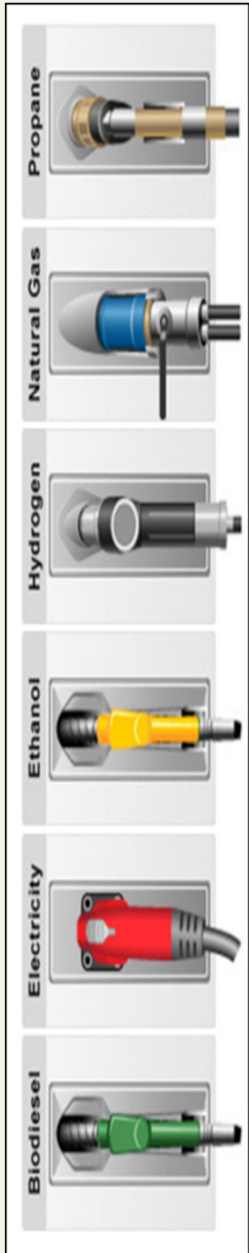
Subcommittee Timeline-ish



- Electric
- Gaseous Fuels
 - Natural Gas
 - Propane
- Biofuels
 - Biodiesel
 - Ethanol
 - Other
- Hydrogen

Refuel:

Subcommittee Meeting Schedule



- Electric:
 - 2014: November
 - 2015: February, May & August
- Gaseous Fuels
 - 2014: December
 - 2015: February, March & June
- Hydrogen
 - 2014: December
 - 2015: March & June
- Biofuels
 - 2015: January, April & July

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San Diego Regional Alternative Fuel
Coordinating Council

Item 5

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Member Responsibilities

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San Diego Regional Alternative Fuel
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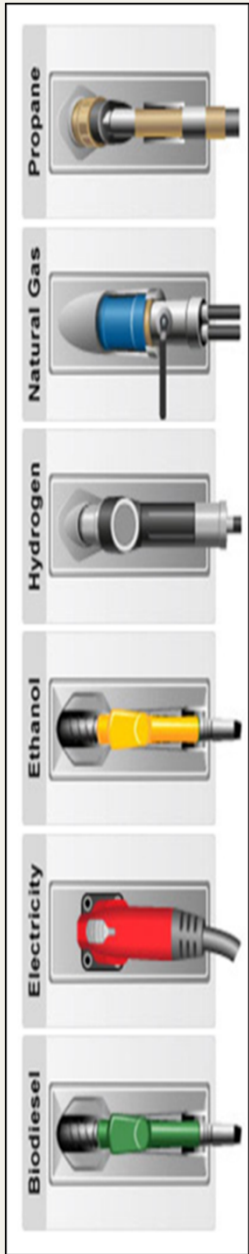
Item 6

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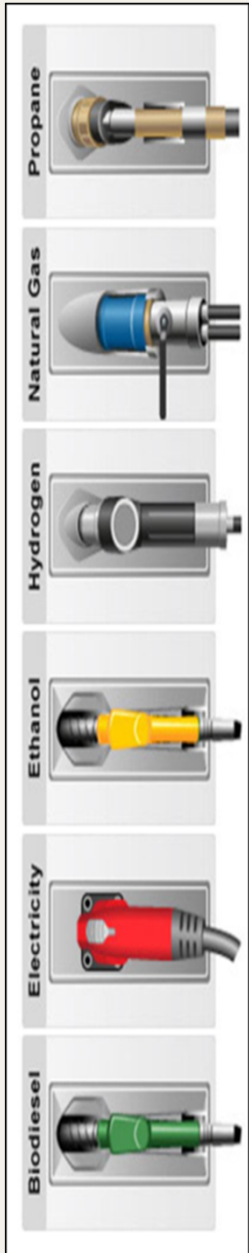
Formation Documents

Mission Statement

To support innovative partnerships and to facilitate and develop a San Diego regional alternative fuel (AF) readiness plan that identifies, reduces or resolves barriers to the widespread deployment of AF infrastructure and vehicles; thereby showcasing the San Diego region as a national leader in AF readiness.

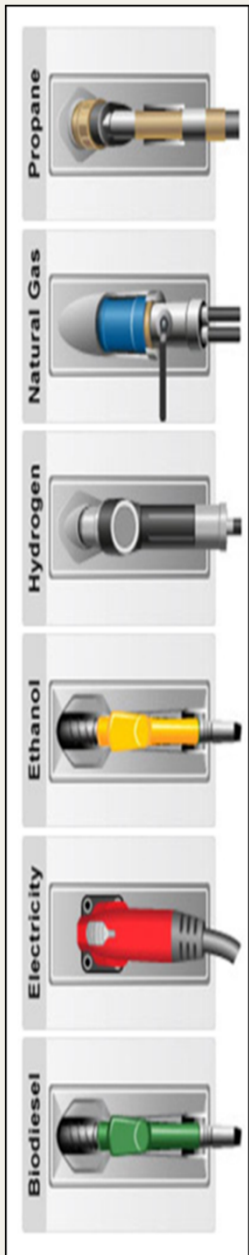


Goals



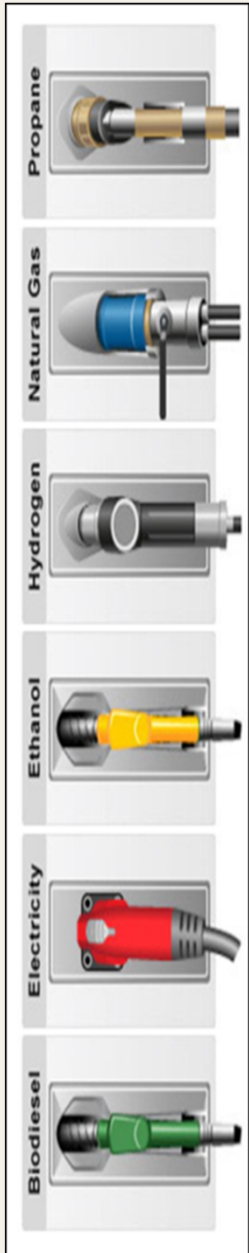
1. To establish a regional alternative fuel (AF) coordinating council to help streamline practices and address barriers to AF adoption as well as provide real-time learning and sharing across jurisdictions and to diverse stakeholders involved in AF readiness.
2. To provide input toward a regionally-accepted comprehensive AF Readiness Plan that leverages past planning efforts, addresses barriers and complexities, and lays the framework for future AF planning efforts.

Goals



3. To provide consistent messages across jurisdictions, agencies, dealerships, consumers, companies, educational institutions, fuel providers, and others about AFs.
4. To leverage and foster partnerships among government, business, academia, and other organizations to promote AF deployment and support economic development in the region.

Charter



1. Purpose
2. Responsibilities
3. Membership
 - Voting members
 - Local government membership
 - Advisory members
4. Meeting time and location

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San Diego Regional Alternative Fuel
Coordinating Council

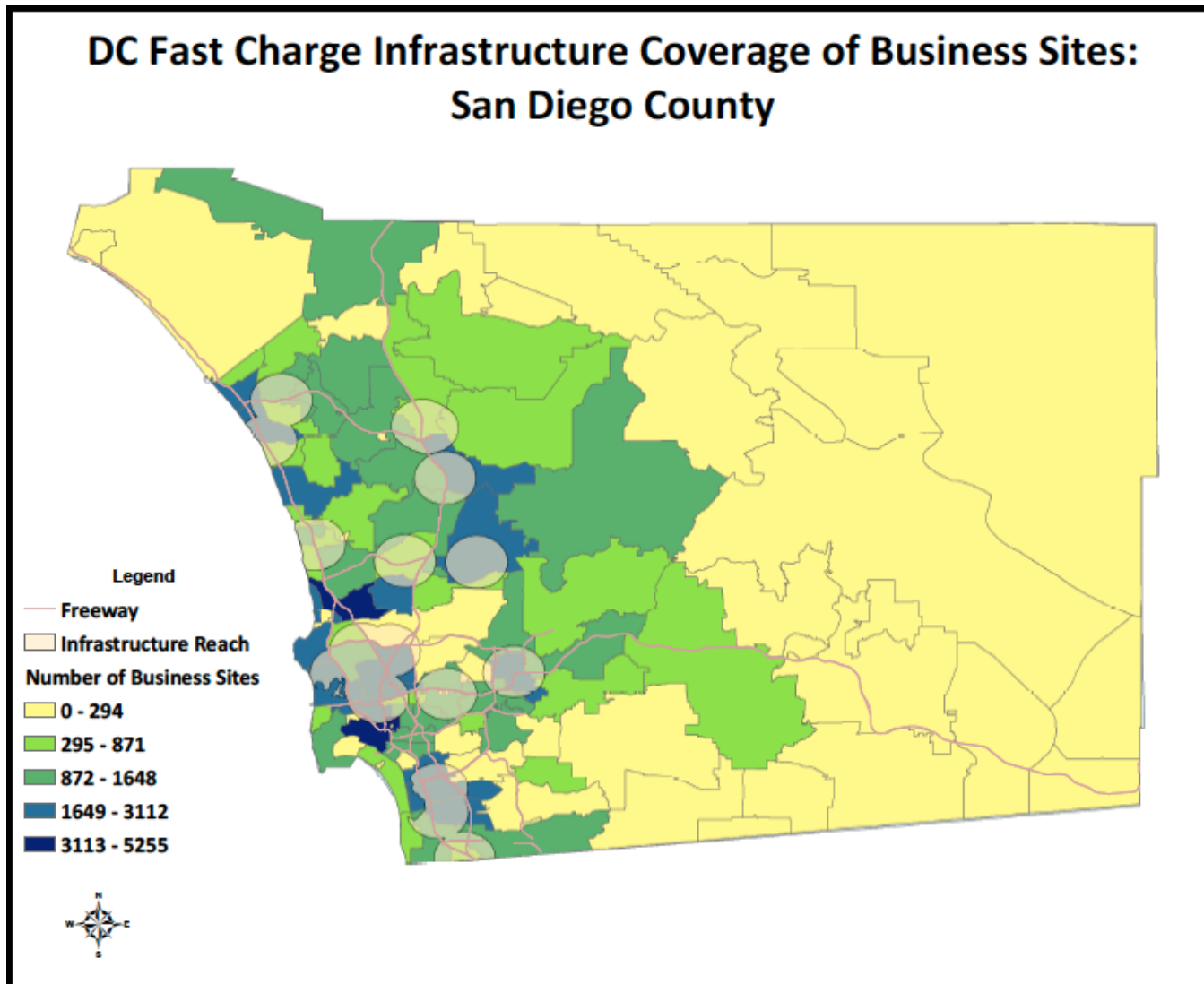
Refuel: Contact Information

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www.sandag.org/refuel

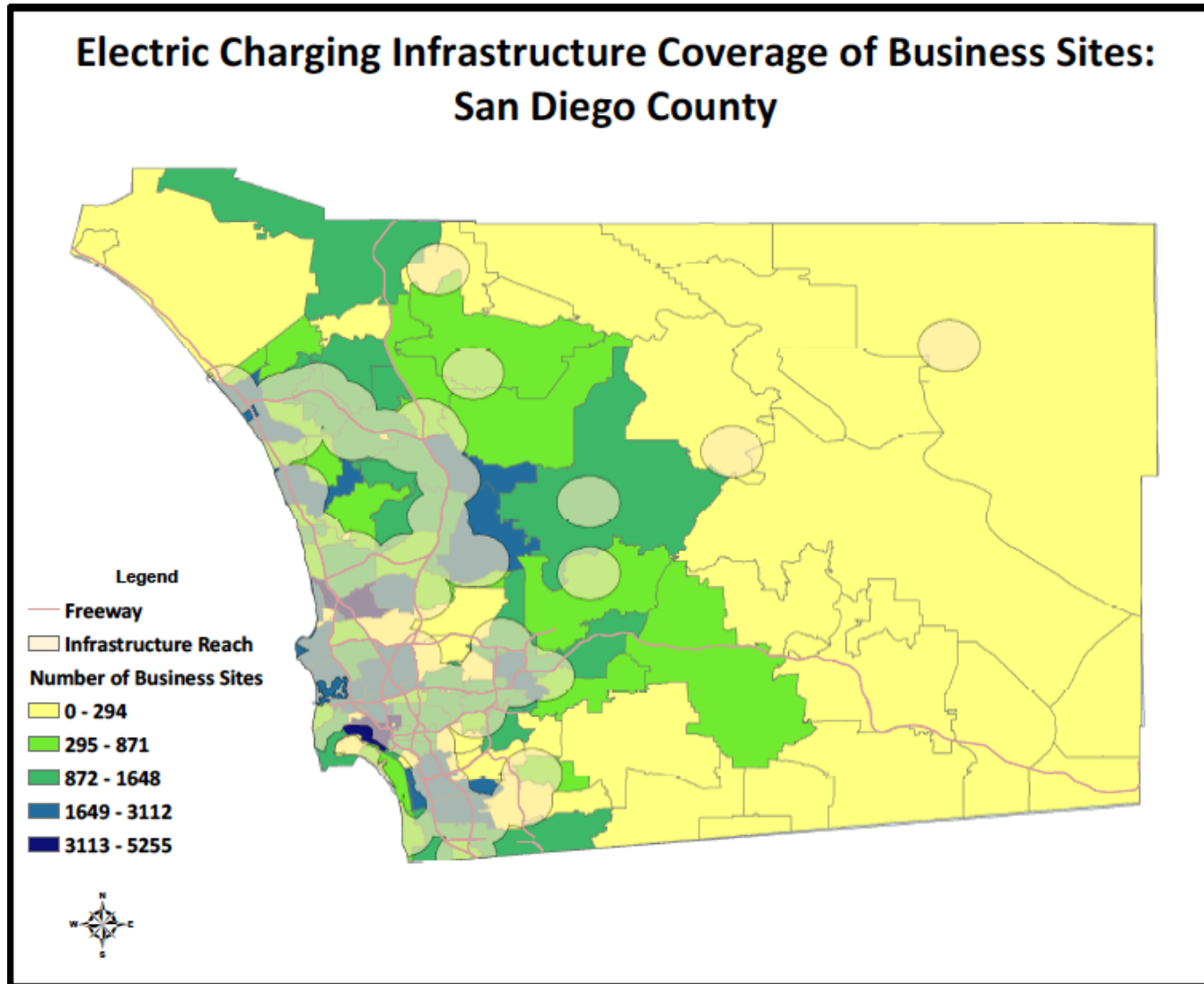
Kevin Wood, SDRCCC
kevin.wood@energycenter.org
(858) 5244-7295
www.sdcleancities.org

San Diego Regional Alternative Fuel Infrastructure

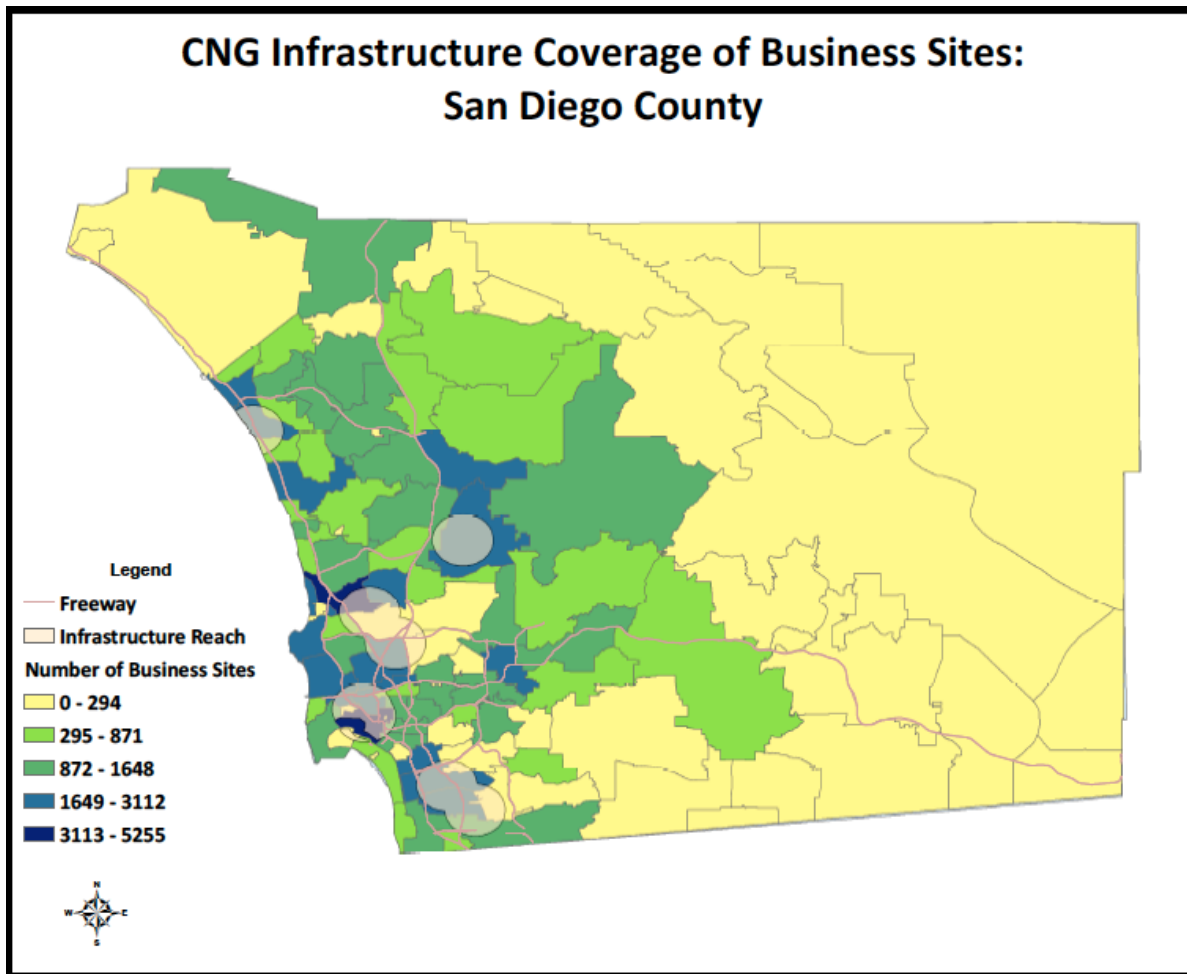
Electric Charging – DC Fast



Electric Charging –Level 2

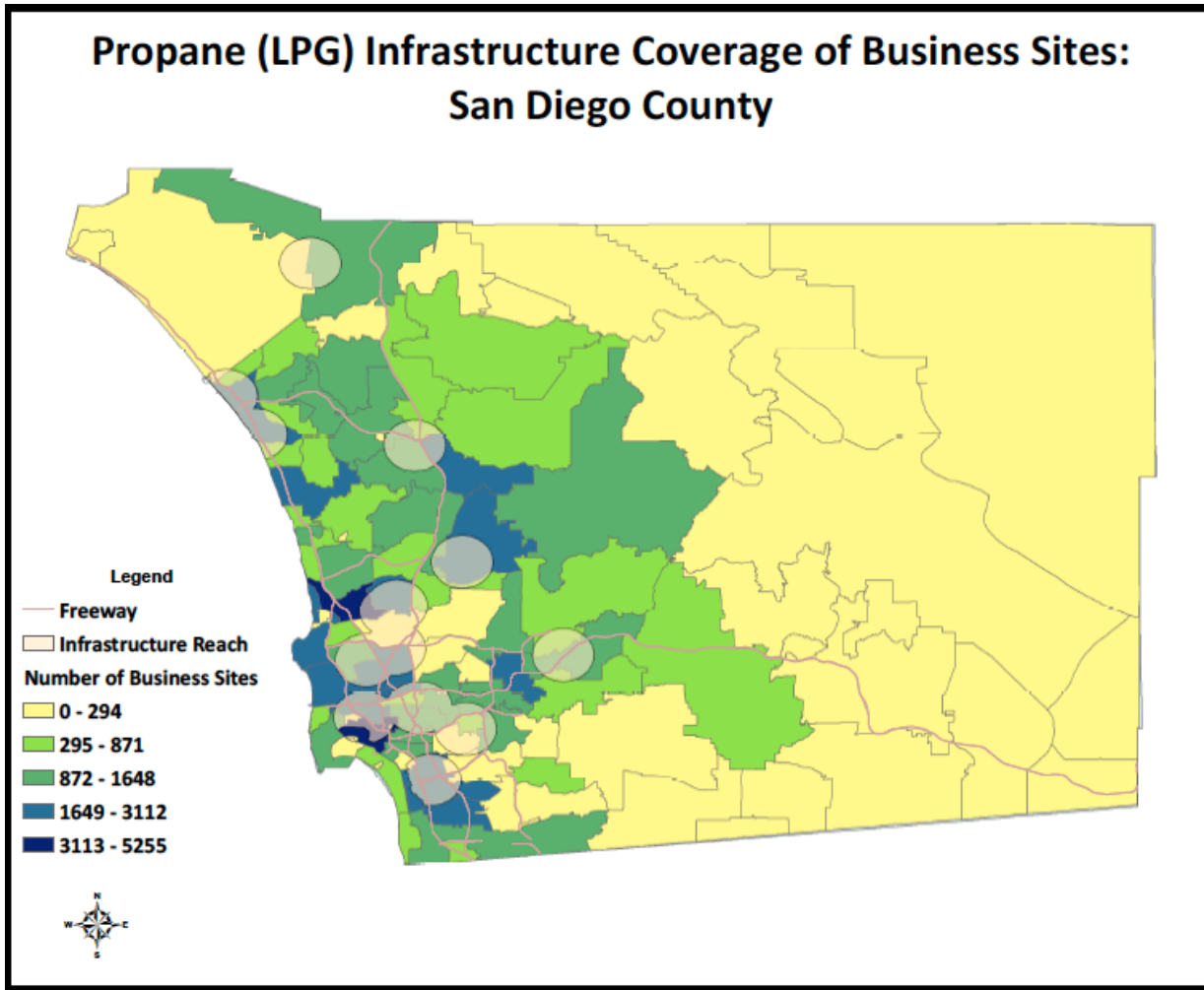


Compressed Natural Gas (CNG)



Site Type	Range Length (miles)	% of Sites Covered
All Residence	2.5	17%
All Residence	5	47%
All Business	2.5	28%
All Business	5	57%
HD Business	2.5	24%
HD Business	5	48%

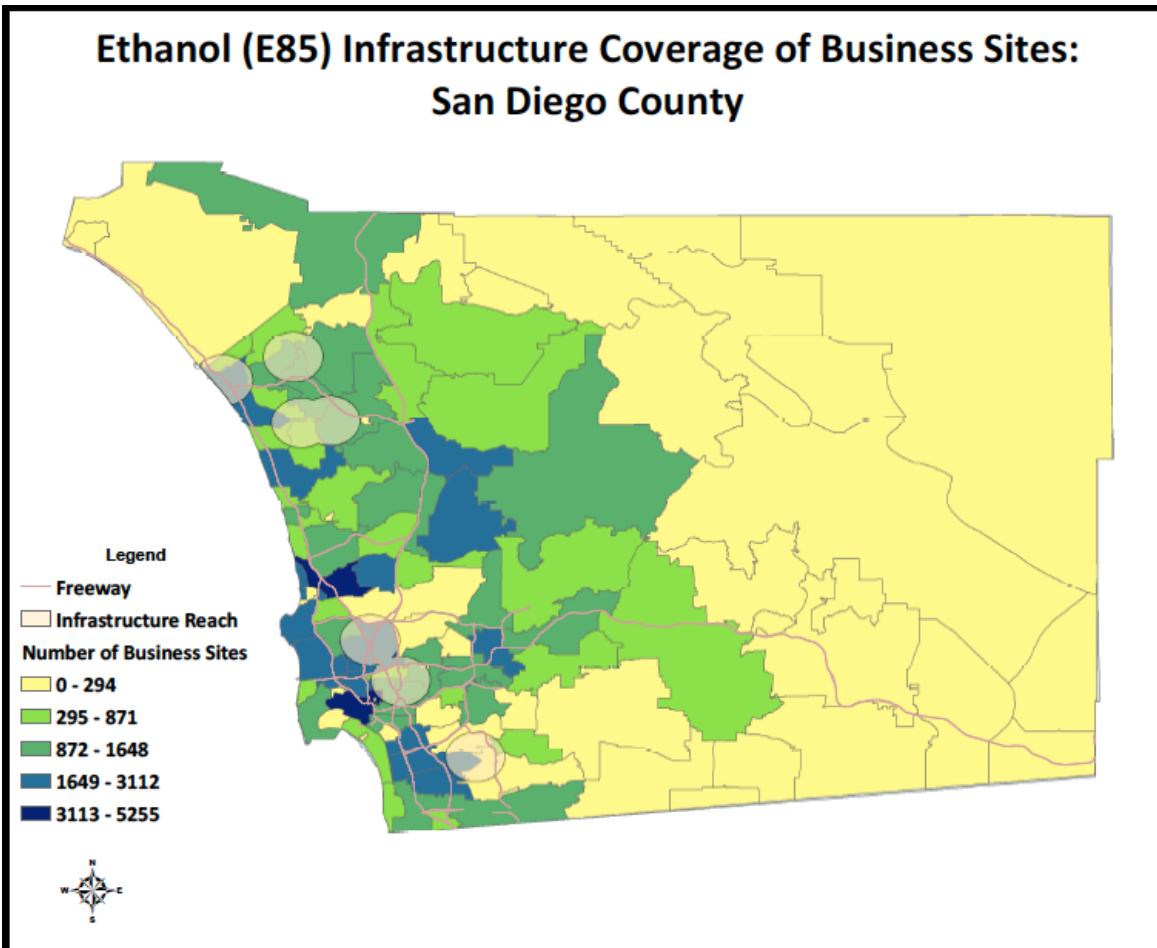
Propane (LPG)



Site Type	Range Length (miles)	% of Sites Covered
All Residence	2.5	32%
All Residence	5	66%
All Business	2.5	45%
All Business	5	77%
LD Business	2.5	46%
LD Business	5	78%
MD Business	2.5	43%
MD Business	5	75%

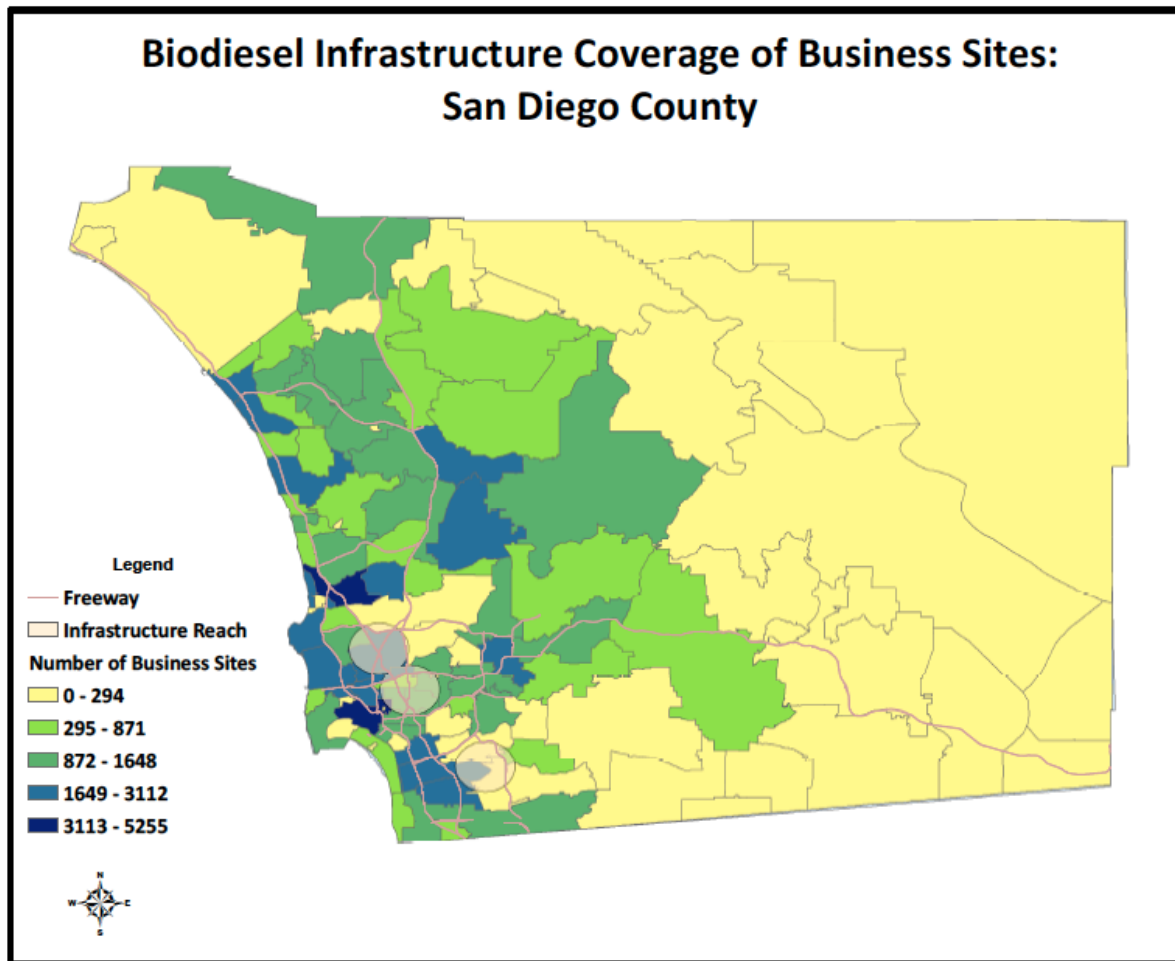
Ethanol

**Ethanol (E85) Infrastructure Coverage of Business Sites:
San Diego County**



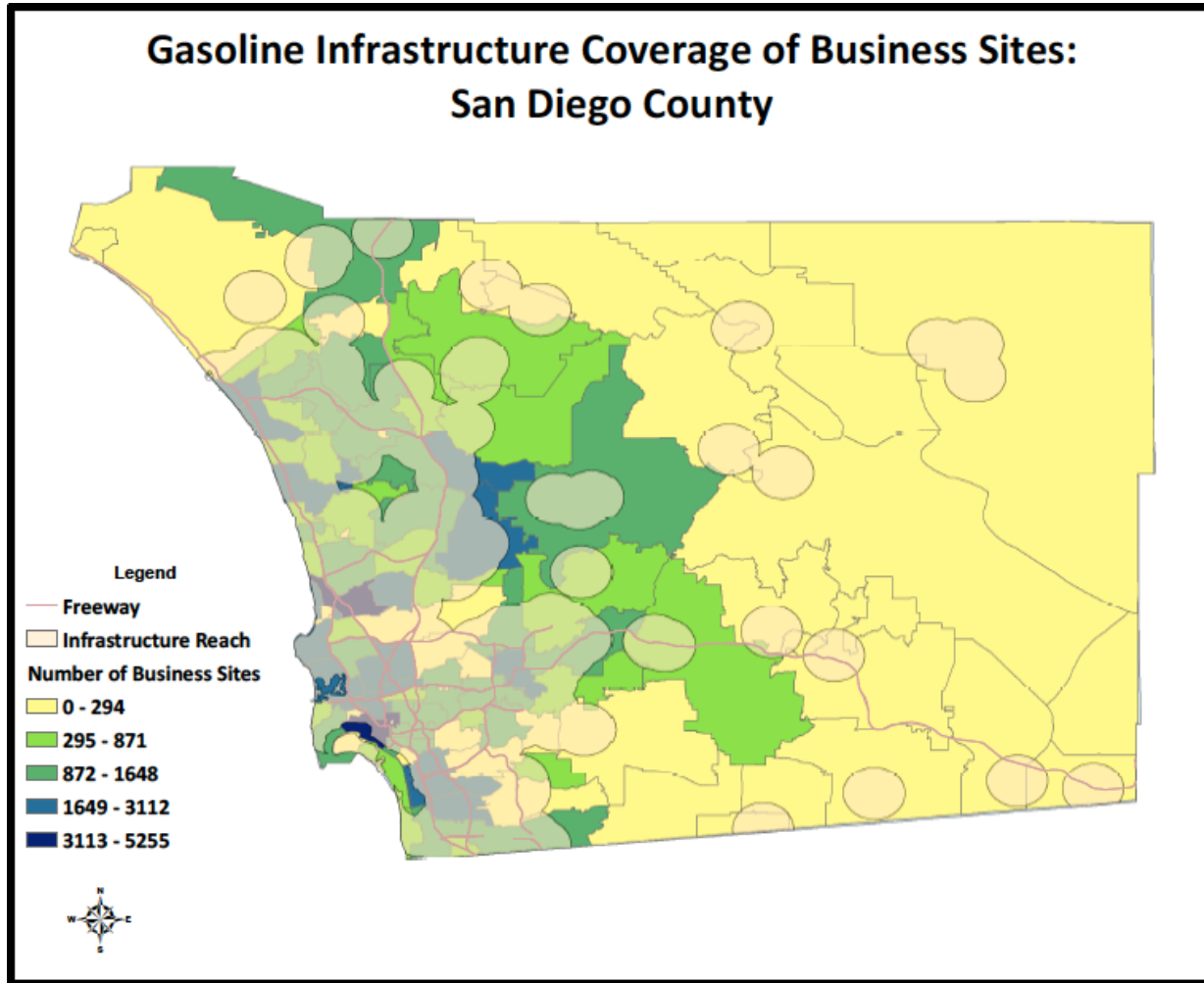
Site Type	Range Length (miles)	% of Sites Covered
All Residence	2.5	19%
All Residence	5	48%
All Business	2.5	24%
All Business	5	50%
LD Business	2.5	26%
LD Business	5	51%

Biodiesel




Site Type	Range Length (miles)	% of Sites Covered
All Residence	2.5	11%
All Residence	5	29%
All Business	2.5	13%
All Business	5	35%
HD Business	2.5	11%
HD Business	5	28%

Gasoline



San Diego Regional Barriers to Alternative Fuel Deployment

- 
- **Alternative Fuel Infrastructure**
 - **Alternative Fuel Vehicles**
 - **Education and Training**