

REFUEL: SAN DIEGO REGIONAL ALTERNATIVE FUEL COORDINATING COUNCIL

NATURAL GAS SUBCOMMITTEE MEETING

April 22, 2015

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1. HISTORY AND BACKGROUND OF NATURAL GAS

Due to the intimate group size, there was only a brief description of natural gas in the San Diego region. The first natural gas stations in the region were built by San Diego Gas & Electric (SDG&E) in the 1990s.

In the 1990s-2000s, California was moving towards natural gas for its clean air qualities compared to diesel and petroleum. It was an order of magnitude cleaner than diesel.

2. STATE OF NATURAL GAS

Fueling Stations Available

- The largest user of natural gas is the San Diego Metropolitan Transit System (MTS). They have been slowly integrating natural gas into their fleet over the past 15 years. In 2015, they will have a 100% natural gas fleet.
- Refuse fleets in San Diego County widely use natural gas.
 - Waste Management San Diego worked in partnership with Calpine to use the emission reductions from Waste Management's natural gas fleet to offset the carbon emissions to build a new power plant in San Diego County.
- Currently, though new technology diesel engines (NTDE) is now comparable to natural gas in terms of tailpipe emissions according to lab tests, natural gas still provides lower greenhouse gas emission without accessory equipment.
 - In regards to the federal congestion mitigation and air quality improvement program, there is no extra funding going to natural gas vehicles over NTDEs.

Renewable natural gas (RNG) is becoming more popular in the market.

- Biogas is captured from landfills, livestock operations, or wastewater treatment, then treated and refined to remove non-CH₄ (which makes up natural gas) particles, and added to the grid.
 - The RNG is sold through lines of natural gas transmission to stations.
- The full well-to-wheels cycle provides RNG with a lower carbon intensity than traditional LNG or CNG. There are fewer emissions when it is used, putting it on par with electric vehicles.
- Of the four Clean Energy natural gas stations in the San Diego region, only the Chula Vista station does not offer RNG. In order for a station to offer RNG:
 - Station needs to opt-in for RNG, which requires putting Clean Energy on a meter bill to track RNG being used and coming through to the station.
 - Using RNG can provide low carbon fuel standard (LCFS) credits.

How is Natural Gas Being Used

- Transit, refuse, and airport shuttle fleets are the main users of natural gas. There is growth for CNG tow trucks.

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- Across the County:
 - 65% of all trash trucks purchased are natural gas
 - 90% of Waste Management's purchased trucks are natural gas
 - 50% of all transit bus purchases are natural gas
- This year, the San Diego airport will introduce a 16 bus fleet for the rental car center that will use natural gas.
- Clean Energy has a natural gas Ford F-650 that's available for renting to allow companies to understand what it's like to use a natural gas vehicle.
- Other private fleets have seen the cost savings of thousands of dollars per year when using natural gas instead of a diesel vehicle.

3. BARRIERS FACED FOR NATURAL GAS STATIONS

- Usually a station serves 150,000 gasoline gallon equivalents (gge) per year.
- Stations are installed once there is knowledge about the local traffic flow and the commitments from fleets that they will be going through to fuel at the station.
 - Generally, looking toward industrial areas where standard fueling station would already be included in zoning codes.
- Station size depends on the type of vehicles that are expected to fuel there.
 - Medium and light-duty vehicles can be supported on a $\frac{3}{4}$ acre – 1 acre lot.
 - Must consider how the vehicles will flow in and out of the station
- Usually want to build a station in an area where the pressure of CNG in the pipeline is high. The amount of pressure of the inlet gas affects the compression needed in order to deliver at the needed psi. The inlet gas pressure also affects the flow of the gas; the higher the inlet pressure, the higher flow that can be delivered.
 - To receive the information of inlet gas pressure, there are public maps available, or SDG&E has forms to fill out to find out the pressure available. Often it can take anywhere from a couple of days to weeks to get the information.
- Storage tank size depends on the number of hoses at the station and the how many vehicles will be fueling at the site. It does not really depend on the amount of fuel flow.
 - Storage tanks are useful when there is the occasional large vehicle that needs to fuel. The storage tank will help fuel the large vehicle quickly
 - If the main fueling visits are from light- to medium-duty vehicles, the storage is not necessary. The flow from the compressor to the nozzle will provide a satisfactory experience in itself.
 - Storage enhances the fueling experience and has fuel ready
- Standard onboard fuel storage is at 3600 psi. There are two different nozzles that are standard for natural gas vehicles.
 - The light- and medium-duty nozzle handles up to 1,000 cubic feet per minute (CFM), which is about 10 gge/minute. It also works for heavy-duty vehicles.
 - Heavy duty vehicles are equipped to take fuel from a larger nozzle. Typically, heavy duty vehicles have both types of nozzle connection capabilities. Most natural gas fueling stations offer the smaller nozzle.

The Permitting Process

- The siting work, electrical, and mechanical work involved in building a station all require permits.

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- CNG fueling stations also need to follow specific fire codes; station developers work closely with local fire marshals.
- Permitting usually takes 9-10 months for a station to get installed. The construction time is only three months.
- When a new project begins, the station developer goes through a site investigation report process in which local authorities with jurisdiction are contacted and the permitting timeline is developed.
- There is no overarching roadblock when building a station; mainly, the only hurdle is to learn the new permitting requirements of new regions.

Integrated Skid Mount CNG Infrastructure—essentially, there is a set of standardized components that can be dropped on a site. It seems like a beneficial product because the engineering of a station would be quicker.

- Though that type of infrastructure may seem beneficial, a company such as Clean Energy has built so many stations that they are already using pre-engineered components.
- The designs of stations on paper are not very different, but what changes from site to site is how the installation happens and where the pieces of equipment are installed.
- Most engineering time is spent on site-specific details and that variability may add a week to engineering time.
- It is not a common practice to use the skid mount CNG infrastructure as a temporary solution.
 - Sometimes large fleets want to bring in a temporary station for their first vehicles while a station developer designs another one for permanent use.
 - For most customers, it is not cost-effective to gain a couple months of fueling in turn for spending money to ultimately redo the infrastructure from the temporary station.
 - The time it is used as a temporary solution is when a compressor is being replaced or repaired on an existing station.

4. RELEVANT POLICIES AND/OR AREAS FOR POLICY

Are there any policies that a city could adopt to help in station building process?

- The biggest barrier is the cost to build the station. Sometimes a city fleet might not necessarily meet all the numbers for volume to make a station economically feasible on its own.
- Policies that aim to reduce GHG emissions can be beneficial if they help justify green fleet purchases. However, there needs to be the fueling structure available to achieve those goals.
 - Caltrans wants to reduce fleet emissions by 20% by 2020; that is feasible in LA because there are many stations, but there are fewer stations in northern California, making it difficult to get that reduction.

5. SUCCESS STORIES/BEST PRACTICES

- Greater LA area examples of CNG use:
 - LAX is selling a lot of RNG at the airport – Clean Energy has calculated their carbon savings and will look into sharing the information with Refuel.
 - City of Irvine replaced their pick-up trucks with natural gas versions and added nine additional ones to their fleet.

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- Knowing vehicle availability is important when deciding whether to adopt an alternative fuel
- San Diego region examples of CNG use:
 - City of Chula Vista and San Diego Air Pollution Control District use a lot of CNG.
- The benefit of natural gas is that it is more price-stable than diesel and petroleum. This allows fleets to properly plan for the future.

The next time the natural gas subcommittee meets the Refuel staff will put together materials documenting and packaging the case of natural gas for fleets and will review those resources.

Attendees / Call-in Participates

- Susan Freedman – San Diego Association of Governments (SANDAG)
- Dave Ulrich – Clean Energy
- Jack Hogan – Clean Energy
- Anna Lowe – SANDAG
- Nick Cormier – San Diego County Air Pollution Control District
- Kevin Wood – Center for Sustainable Energy (CSE)
- Jessica Jinn – CSE
- Michelle Martinez – SANDAG