

Upgrading Refuse Fleets to CNG: Three Considerations Beyond Economics



Refuse fleets are one of the fastest growing markets for compressed natural gas (CNG), primarily due to the significant fuel costs they can save. In a fleet where the cost difference between diesel and natural gas ranges from \$2 to \$3 per diesel gallon equivalent (DGE), vehicles that use approximately 10,000 gallons of fuel per year will save the refuse operator \$20,000 to \$30,000 annually. Multiply those savings by the number of vehicles in the fleet, and again by the average life of a refuse vehicle (which is 12 years), and the dollars start to really add up. Even when you consider the incremental cost of a natural gas-powered refuse truck at \$30,000 to \$45,000 per vehicle, the economics play out nicely.

However, the analysis for potentially upgrading a refuse fleet to CNG shouldn't simply be about the economics. Here's what else is in play.

Modifications for Maintenance and Repair Facilities

Virtually all existing maintenance and repair facilities for refuse fleets were originally designed for diesel- or gasoline-powered vehicles. These fuels are heavier than air, and pool on the ground when leaked. If these facilities are now expected to accommodate natural gas vehicle repair, they must be evaluated and modified to meet the fire, electrical, mechanical, building and other safety codes for natural gas. Natural gas is a lighter-than-air fuel which rises and dissipates when leaked, and facilities where natural gas vehicles will be repaired must be capable of functioning in a safe manner.

In each facility, the building envelope, as well as the ventilation, lighting, heating, and electrical systems must be evaluated along with any below-grade surfaces. In addition, functions must be evaluated such as welding and hot work. Maintenance and repair facility evaluations should be performed by a qualified and experienced company. Otherwise, the refuse fleet may wind up making modifications that are either inadequate and result in disapproval by the authority having jurisdiction (AHJ), or significantly overdesigned and cost more than they should.

As an example, a large heavy-duty vehicle dealer received an initial evaluation and cost estimate from an inexperienced provider that came to the tune of \$800,000. After consulting an [industry-recognized firm](#) experienced with NGV maintenance facility modifications, the actual cost was \$490,000.

An effective maintenance facility evaluation should include not only a report of the recommended modifications to bring the building up to code for natural gas vehicles, but a cost estimate of the modifications to be performed. Armed with this information, the refuse fleet will have a fuller understanding of total upgrade costs for both vehicles *and* facilities, and will be able to plan and even analyze costs and payback more accurately.

Choosing the Best Fueling Option

Believe it or not, some fleets try to make the decision to upgrade to CNG without a clear understanding of what type of fueling they need and what will be most beneficial for them, both from an operational standpoint as well as an economic one. Partnering with an [unbiased expert](#) helps refuse fleets review all fueling options, accurately project both current and future needs, and arrive at the fueling solution that works best for the fleet.

While some opt for public CNG stations, many decide to operate their own time-fill fueling stations because the nature of their operations is ideal for it — i.e., parking vehicles overnight at a central facility. The capital expense for time-fill fueling is significantly less expensive than fast-fill because the fuel is provided to the vehicles directly from the compressors, which usually operate overnight. This means there's no need for more costly CNG storage, and it's easier to plan for and accommodate fleet expansion.

That said, refuse fleets can still use fast-fill fueling stations that they also own and operate, and many fleets have a combination of both.

Employee Development and Training

Perhaps the most frequently overlooked component of deciding to upgrade to CNG is assessing the employee [development and training](#) needs BEFORE the upgrade begins. Many companies recognize the need for technician training, but don't immediately grasp the necessity to train supervisors, operations personnel, safety managers, risk managers, and others who will be involved in the process of CNG integration. Here are some general recommendations:

- Every technician — regardless of whether or not they will be repairing natural gas vehicles — should take basic [NGV safety training](#). It covers the properties and characteristics of the fuel, the components of the CNG fuel system and its serviceability, how to fuel and defuel a vehicle, and the principles for safely working on natural gas vehicles inside a maintenance facility.
- More advanced technicians — those who will be conducting the federally mandated CNG fuel system inspections every three years or 36,000 miles, or after any fire or accident — should receive [CNG Fuel System Inspector training](#). For a second layer of safety and liability protection, it is strongly encouraged that these same technicians receive [Fuel System Inspector Certification](#).
- Finally, it is essential that all technicians who will be diagnosing and repairing heavy-duty natural gas vehicles receive training that explains the procedures for [diagnosing both the components of the CNG fuel system and the engine systems](#), as well as how to perform basic repair procedures.

While economics is probably viewed as the most important factor when considering the upgrade to CNG, those fleets that are on the front end of the decision will have a more complete picture by factoring in maintenance facility modifications, fueling options, and employee development and training needs. The result will be a more thorough analysis, and ultimately a smoother transition to the premium fuel — natural gas.