GUIDANCE FOR CALCULATING ENERGY METRICS

1. **Jobs Created/Retained:** Jobs created means new positions created and filled or existing unfilled positions that are filled as a result of Recovery Act funding. Jobs retained means existing filled positions that would not have been retained if not for Recovery Act funding. Jobs created and retained must be reported in full-time equivalents, or FTE. The U.S. Office of Management and Budget provides guidance (OMB M-09-21 Section 5 http://www.whitehouse.gov/omb/assets/memoranda_fy2009/m09-21.pdf) for estimating the FTE jobs based on the following equation:

$$\text{Jobs created (FTE)} = \frac{\text{Cumulative Recovery Act Funded Hours Worked (hrs)}}{\text{Cumulative Hours in a Full} - \text{Time Schedule (hrs)}}$$

> **Example**: if 100 hours will be spent converting CNG fleet for a period of 2 months, the total number of hours in a full-time schedule would be: 2 months x 4 weeks/month x 40 hours per week = 320 hours
>
> Jobs created/retained = 100 hrs / 320 hours = 0.31 FTE.

2. **Annual Electricity Savings (kWh)*:** For Transportation Efficiency Projects involving retrofitting of street lighting and/or traffic signals, Annual Electricity Savings represents the difference between the current energy use of equipment, and the estimated future energy use of that equipment:

$$\text{Annual Electricity Savings (kWh)} = \text{Current Energy Use (kWh)} - \text{Estimated Future Energy Use (kWh)}$$

**This metric does not apply for projects involving vehicle purchases/conversions and construction of CNG stations.*

3. **Annual Gas/Diesel Savings (gallons):** for projects that involve purchasing and conversion of vehicles to CNG or the construction of CNG stations, it can be assumed that for every Gasoline Gallon Equivalent (GGE) of CNG dispensed, one gallon of gasoline is displaced and approximately 0.88 gallons of diesel are displaced. To convert from cubic feet of CNG to GGE, the following conversion factors must be used:

Fuel	Gallon Gas Equivalent (GGE)
Gasoline	1 gallon
CNG	126.67 cu ft
Diesel	0.88 gallons

Example: if a station dispenses 1,000,000 cu ft of CNG per month, the amount of fuel displaced in a year equals:

$$\text{CNG dispensed in a year (GGE)} = \frac{1{,}000{,}000\ (\text{cu ft})}{126.67\ (\text{cu ft/GGE})} \text{x} \frac{12\ \text{months}}{\text{year}} = 94{,}734.35 \left(\frac{\text{GGE}}{\text{year}}\right)$$

94,734.35 GGE of CNG/year = 94,734.35 gallons of Gasoline or 83,366.23 gallons of Diesel

4. **Emissions Reduced (Metric Tons CO2):**

A) **Transportation Efficiency:** For projects involving the retrofitting of street lighting and/or traffic signals, Greenhouse gas (GHG) emission reductions are tied to electric energy savings. A simple calculation is to assume that all energy savings are reductions in electricity usage. This electricity reduction then is converted into emission reductions based upon the electricity emission profile for subregion SERC Mississippi Valley using Environmental Protection Agency (EPA) eGrid data (http://cfpub.epa.gov/egridweb/view.cfm):

$$\text{GHG Emissions Reduced (MT CO2e)} = \text{Annual Energy Savings (kWh)x} \frac{0.46433}{1000} \left(\frac{\text{MT CO2}}{\text{kWh}}\right)$$

B) Alternative Fuels and Refueling Infrastructure: for projects that involve purchasing and conversion of vehicles to CNG, Greenhouse Gas (GHG) emissions reductions are tied to displacement of traditional fuels such as gasoline or diesel and replacing with CNG fuels. To estimate the GHG emissions reductions for proposed projects, multiply the annual Gas/Diesel Savings by an emission factor, less the amount of CNG consumed times another emission factor**, as shown in the formula below:

Using annual gasoline savings:

$$\text{GHG Emissions Reduced (MT CO2e)} = \left[\text{Annual Gasoline Savings (gallons) x} \frac{0.00939\ \text{MT CO2e}}{\text{gallons}}\right] - \left[\text{Annual CNG Dispensed (GGE of CNG) x} \frac{0.00722\ \text{MT CO2e}}{\text{GGE}}\right]$$

Using annual diesel savings:

$$\text{GHG Emissions Reduced (MT CO2e)} = \left[\text{Annual Diesel Savings (gallons)} \times \frac{0.00950 \text{ MT CO2e}}{\text{gallons}}\right] - \left[\text{Annual CNG Dispensed (GGE of CNG)} \times \frac{0.00722 \text{ MT CO2e}}{\text{GGE}}\right]$$

***Emission factors were obtained from the 1605 Voluntary GHG Emissions Reporting Guidelines produced by DOE http://www.eia.doe.gov/oiaf/1605/ggrpt/, 2001.*

Example: if a station dispenses 1,000,000 cu ft of CNG per month, the GHG emissions reduced equal:

$$\text{CNG dispensed in a year (GGE)} = \frac{1{,}000{,}000 \text{ (cu ft)}}{126.67 \text{ (cu ft/GGE)}} \times \frac{12 \text{ months}}{\text{year}} = 94{,}734.35 \left(\frac{\text{GGE}}{\text{year}}\right)$$

Annual Gasoline Savings = 94,734.35 gallons of gasoline

$$\text{GHG Emissions Reduced (MT CO2e)} = \left[94{,}734.35 \text{ (gallons of gasoline)} \times \frac{0.00939 \text{ MT CO2e}}{\text{gallon}}\right] - \left[94{,}734.35 \text{ (GGE of CNG)} \times \frac{0.00722 \text{ MT CO2e}}{\text{GGE}}\right] = 205.57 \text{ MT CO2e}$$