South Coast AQMD Staff Responses to So Cal Gas Comments dated 1/7/2021

1. Outdated input data
   RASS 2019: The California Energy Commission indicated that the survey from 2019 has been completed, but data is still under review and the specific data used in the NEAT, such as UEC values and appliance penetration records, are still under review and not available as of January 15, 2021. Staff will continue communicate with CEC to stay informed with the progress of the 2019 RASS data processing

   EMFAC: Staff recalculated the emissions factors for gasoline and diesel passenger vehicles. The default values were calculated using EMFAC2014 because it was the official model approved by EPA at the time. New values using EMFAC2017 have been calculated (see table 1). Also, EMFAC2017 provides estimates of CH4 and N2O emissions, so full CO2-equivalent emissions from vehicle operation can be calculated. However, the contribution of non-CO2 pollutants to total CO2 equivalent emissions is small (~1% for gasoline vehicles and ~4% for diesel vehicles).

   GREET: the GREET 2.0 model was used to calculate well-to-tank emissions for gasoline and diesel. There have been new versions of GREET since then, and new emission factors have been calculated using the most current version of the model, GREET 2020 (see table 1).

2. Upstream vehicle GHG emissions with 20-year vs 100-year time horizon
   Well-to-tank emissions from fuel production are calculated using the GREET model. Greenhouse gases emissions include CO2, N2O and CH4, and are expressed as CO2-equivalent. GREET assumes a 100-year time horizon as default, therefore, NEAT default was originally 100-year for this category. Emission factors for a 20-year time horizon have now been also included in NEAT (see table 1), and users have now the option to select the time horizon that is used to calculate total GHG emissions from both NG leaks and upstream fuel production for vehicles.

Table 1: Emission factors (lb/gal) for vehicle emissions considered in NEAT

Model Year 2017 EMFAC14 & GREET2.0 (original default in NEAT)				
	Gasoline		Diesel	
	GHG	NOX	GHG	NOX
Well-to-tank	6.30	0.0117	7.22	0.0152
Vehicle Operation	18.66	0.0060	22.22	0.0130

Model Year 2018 EMFAC17 & GREET2020 100-year horizon				
	Gasoline		Diesel	
	GHG	NOX	GHG	NOX
Well-to-tank	5.42	0.0115	5.84	0.0124
Vehicle Operation	19.13	0.0061	23.38	0.0148

Model Year 2018 EMFAC17 & GREET2020 20-year horizon				
	Gasoline		Diesel	
	GHG	NOX	GHG	NOX
Well-to-tank	6.94	0.0115	7.59	0.0124
Vehicle Operation	19.18	0.0061	23.38	0.0148

3. The default appliance costs in the tool aren't accurate. They need to be changed before using the tool for policy.

   The default appliance parameters in the tool were heavily vetted by the workgroup over two meetings. However, staff stress throughout the tool itself and in the documentation that the default parameters should not be used directly. It is strongly recommended that users (including South Coast AQMD staff) do research on the current state of the market to determine these costs and efficiencies when they run a scenario.

4. You don't consider all greenhouse gases when calculating CO2equivalent emissions

   Staff decided to only include CO2 when calculating the CO2eqivalent emissions from combustion but methane from non-combustion sources such as leaks is included. This was vetted through the workgroup. There is a small amount of methane that does not get burned and N2O, which is a potent greenhouse gas, can also be produced during combustion.

   Based on emission factors in the AP-42 database, contribution of non-CO2 emissions to total CO2-equivalent emissions is less than 1% for residential furnaces, representing NG appliances (see Table 2) and ~1% for natural gas-fired gas turbines, representative of fossil-based electricity generation (see Table 3).

Table 2: GHG emissions from NG combustion from residential furnaces

Pollutant	Emission Factor (lb/10^6 scf)
CO2	120,000
N2O	2.2
CH4	2.3
GHGeq 20-year	120,774
GHGeq 100-year	120,647

Table 3: GHG emissions from NG gas turbines

Pollutant	Emission Factor (lb/MMBtu)
CO2	110
N2O	0.003
CH4	0.0086
GHGeq 20-year	111.5
GHGeq 100-year	111.0