Greenhouse Gas Potential

"Greenhouse Gas Potential", or "*GHGp*" means:

$$GHGp = \Sigma(Charge \times GWP)$$

Where:

$\sum$ is the sum of the products of charge multiplied by the GWP for each separate type of refrigerant.

Weighted Average Global Warming Potential

"Weighted-average GWP" means $\sum$ (charge x GWP)/ $\sum$ charge

Where:

Charge equals the pounds of each separate type of refrigerant, refrigerant blend, or heat transfer fluid used in refrigeration equipment and systems.

$\sum$ in the numerator is the sum of the products of charge multiplied by the GWP for each separate type of refrigerant.

$\sum$ in the denominator is the sum of all pounds of refrigerant charge in all refrigeration equipment with more than 50 pounds of refrigerant.

Example

Company "Cool" has two retail food facilities each with two systems. The company had the following refrigerant systems for calendar year 2019:

Facility	System	Refrigerant	GWP	Charge
Cool 1	Cheese	R-407A	2107	200
Cool 1	Dairy	R-421A	2631	125
Cool 2	Meat	R-407A	2107	175
Cool 2	Beverages	R-413A	2053	250

Since the company has only two retail food facilities, they shall attain a company-wide weighted-average GWP of less than 1,400 or a 55% or greater reduction in GHGp below 2019 levels by January 1, 2030.

To calculate GHGp for 2019:

GHGp = Σ(Charge × GWP)

GHGp = (200 x 2107) + (2631 x 125) + (2107 x 175) + (250 x 2053)

GHGp = 1632250 lbs. CO_2e

Convert to Metric Tons 1 metric ton = 2204.62 lbs.

GHGp = 1632250 lbs. CO_2e/2204.62

GHGp = 740.38 $MTCO_2e$ - This is the baseline GHGp from which compliance will be determined if the facility does not have a weighted-average GWP of less than 1,400 by January 1, 2030.

To calculate weighted-average GWP for 2019:

Weighted-Average GWP = ∑ (charge x GWP)/ ∑ charge

Weighted-Average GWP = ((200 x 2107) + (2631 x 125) + (2107 x 175) + (250 x 2053))/(200 + 125 + 175 +250)

Weighted-Average GWP = 2176.33 Weighted Average GWP for 2019

In this example, let's suppose that Company Cool made the following modifications to their refrigerant systems in 2020:

Facility	System	Refrigerant	GWP	Charge
Cool 1	Cheese	R-32	675	200
Cool 1	Dairy	R-22	1810	250
Cool 2	Meat	R-32	675	125
Cool 2	Beverages	R-413A	2053	200

To calculate GHGp for 2020:

GHGp= Σ(Charge × GWP)

GHGp= (200 x 675) + (250 x 1810) + (125 x 675) + (200 x 2053)

GHGp = 1082475 lbs. CO_2e

Convert to Metric Tons 1 metric ton = 2204.62 lbs.

GHGp = 1082475 lbs. CO_2e/2204.62

GHGp = 491 $MTCO_2e$ - This is the company's GHGp for 2020.

The baseline GHGp from 2019 was 740.38 $MTCO_2e$. To determine if the company is in compliance with the 55% or greater reduction:

Reduction % = 100% - ((Current GHGp/Baseline GHGp 2019) x 100%)

Reduction % = 100% - ((491/740.38) x 100%)

Reduction % = 33.68 %

This is not a 55% reduction from the 2019 baseline, so the company is not in compliance based on their GHGp.

To calculate the weighted-average GWP for 2020:

Weighted-Average GWP = ∑ (charge x GWP)/ ∑ charge

Weighted-Average GWP = ((200 x 675) + (250 x 1810) + (125 x 675) + (200 x 2053))/(200 + 250 + 125 + 200)

Weighted-Average GWP = 1396.74

The weighted average GWP for 2020 is below 1400, meaning the company is in compliance with the 2030 target.

Please note that compliance can be achieved by either the GHGp or the weighted-average GWP.