



# Enhanced refrigerant management

Possible 1 point

## Intent

To reduce ozone depletion and support early compliance with the Montreal Protocol while minimizing direct contributions to climate change.

## Requirements

### Option 1. No refrigerants or low-impact refrigerants (1 point)

Do not use refrigerants, or use only refrigerants (naturally occurring or synthetic) that have an ozone depletion potential (ODP) of zero and a global warming potential (GWP) of less than 50.

OR

### Option 2. Calculation of refrigerant impact (1 point)

Select refrigerants that are used in heating, ventilating, air-conditioning, and refrigeration (HVAC&R) equipment to minimize or eliminate the emission of compounds that contribute to ozone depletion and climate change. The combination of all new and existing base building and tenant HVAC&R equipment that serve the project must comply with the following formula:

| IP units |   |       |   |                 |   | SI units |       |   |       |   |                 |   |    |
|----------|---|-------|---|-----------------|---|----------|-------|---|-------|---|-----------------|---|----|
| LCGWP    | + | LCODP | x | 10 <sup>5</sup> | ≤ | 100      | LCGWP | + | LCODP | x | 10 <sup>5</sup> | ≤ | 13 |

| Calculation definitions for LCGWP + LCODP x 10 <sup>5</sup> ≤ 100 (IP units)                        | Calculation definitions for LCGWP + LCODP x 10 <sup>5</sup> ≤ 13 (SI units)  |
|---|--|
| LCODP = [ODPr x (Lr x Life +Mr) x Rc]/Life  | LCODP = [ODPr x (Lr x Life +Mr) x Rc]/Life   |
| LCGWP = [GWPr x (Lr x Life +Mr) x Rc]/Life  | LCGWP = [GWPr x (Lr x Life +Mr) x Rc]/Life   |
| LCODP: Lifecycle Ozone Depletion Potential (lb CFC 11/Ton-Year)                                     | LCODP: Lifecycle Ozone Depletion Potential (kg CFC 11/(kW/year))   |
| LCGWP: Lifecycle Direct Global Warming Potential (lb CO2/Ton-Year)                                  | LCGWP: Lifecycle Direct Global Warming Potential (kg CO2/kW-year)  |
| GWPr: Global Warming Potential of Refrigerant (0 to 12,000 lb CO2/lbr)                              | GWPr: Global Warming Potential of Refrigerant (0 to 12,000 kg CO2/kg r)  |
| ODPr: Ozone Depletion Potential of Refrigerant (0 to 0.2 lb CFC 11/lbr)                             | ODPr: Ozone Depletion Potential of Refrigerant (0 to 0.2 kg CFC 11/kg r)   |
| Lr: Refrigerant Leakage Rate (2.0%)   | Lr: Refrigerant Leakage Rate (2.0%)  |
| Mr: End-of-life Refrigerant Loss (10%)  | Mr: End-of-life Refrigerant Loss (10%)   |
| Rc: Refrigerant Charge (0.5 to 5.0 lbs of refrigerant per ton of gross AHRI rated cooling capacity) | Rc: Refrigerant Charge (0.065 to 0.65 kg of refrigerant per kW of AHRI rated or Eurovent Certified cooling capacity) |
| Life: Equipment Life (10 years; default based on equipment type, unless otherwise demonstrated)     | Life: Equipment Life (10 years; default based on equipment type, unless otherwise demonstrated)                      |

For multiple types of equipment, calculate a weighted average of all base building HVAC&R equipment, using the following formula:

| IP units   |       | SI units   |      |
|--|-------|--|------|
| $\sum (LCGWP + LCODP \times 10^5) \times Q_{unit}$ | ≤ 100 | $\sum (LCGWP + LCODP \times 10^5) \times Q_{unit}$ | ≤ 13 |
| Qtotal   |       | Qtotal   |      |

| Calculation definitions for $[\sum (LCGWP + LCODP \times 10^5) \times Q_{unit}] / Q_{total} \leq 100$ (IP units) | Calculation definitions for $[\sum (LCGWP + LCODP \times 10^5) \times Q_{unit}] / Q_{total} \leq 13$ (SI units) |
|--|---|
|--|---|

Qunit = Gross AHRI rated cooling capacity of an individual HVAC or refrigeration unit (Tons)

Qunit = Eurovent Certified cooling capacity of an individual HVAC or refrigeration unit (kW)

$Q_{total}$  = Total gross AHRI rated cooling capacity of all HVAC or refrigeration

$Q_{total}$  = Total Eurovent Certified cooling capacity of all HVAC or refrigeration (kW)