Agenda item 4.1
Paragraph 22(d) of the annotated agenda

Request for revision
AM_REV_0259 Amendment of equations 1-5 and unit changes throughout methodology

CDM EB 103
Bonn, Germany, 12 to 14 June 2019

Background and purpose

- Background:
  - The revision was submitted by Dubai Carbon Center, on 03/04/2019;

- Purpose: to correct errors and inconsistencies observed in equations 1, 2, 3, 4 and 5 of version 1.0 of AM0117.

Key issues and proposed solutions

- **Equation 1**

BEFORE	AFTER
$SEER_{B,i} = \frac{OPC_i}{(IPE_i \times 0.000278_i + IPT_i)}$	$SEER_{B,i} = \frac{OPC_{B,i}}{IPE_{B,i} + IPT_{B,i}}$

- **Issue:** Units of IPE_i and IPT_i were in kWh and kJ, respectively
- **Revision:** Parameters are referred in MWh.
- **Minor revisions:** changes the nomenclatures of parameters, by including the index *B* for “baseline”

- **Equation 2**

BEFORE	AFTER
$IPT_i = FF_i \times NCV_i \times 10^6$	$IPT_{B,i} = FF_{B,i} \times NCV_{B,i} \times 0.2778$

- **Issue:** Units of IPT_i was in kJ.
- **Revision:** Factor 0.2778 MWh/GJ is included to convert the unit of the parameter to MWh.
- **Minor revisions:** changes the nomenclatures of parameters, by including the index *B* for “baseline”

- **Equation 3**

BEFORE	AFTER
$BE_y = \frac{Q_{B,y}}{3{,}600} \times EF_{FF,y}$	$BE_y = Q_{B,y} \times EF_{B,y} \times 3.6$

- **Issue:** the factor 1/3,600 was incorrectly being used to convert the energy units from GJ to MWh.
- **Revision:** In the proposed revision, the correct factor of 3.6 GJ/MWh is applied to convert the energy unit.
- **Minor revisions:** change the index of the parameters EF, from FF to *B*.

- **Equation 4**

BEFORE	AFTER
$Q_{B,y} = \sum C_{P,r,y} \times SEER_B$	$Q_{B,y} = \sum \frac{OPC_{r,y} \times 10^{-6}}{SEER_{B,i}}$

- **Issue:** the equation was incorrectly multiplying the colling output ($C_{p,r}$) by the seasonal energy efficiency ration ($SEER_B$).
- **Revision:** the energy consumed in the baseline is now determined by dividing the cooling output by the seasonal energy efficiency ration ($SEER_B$).
- **Minor revisions:** change the nomenclature of the parameter $C_{P,r,y}$ to $OPC_{r,y}$.

- **Equation 5**

BEFORE	AFTER
$C_{P,r,y} = c_P \times F_{r,y} \times \Delta T_{r,y} \times h_{r,y} \times 3.6 \times 10^9$	$OPC_{r,y} = c_P \times F_{r,y} \times \Delta T_{r,y} \times h_{r,y} \times 2.77 \times 10^{-10}$

- **Issue:** factor 3.6 x 10^9 was incorrectly being used to convert the units of $OPC_{r,y}$ from GJ to MWh.
- **Revision: :** In the proposed revision, the correct factor of 2.77 x 10^{-10} is applied.
- **Minor revisions:** change the nomenclature of the parameter $C_{P,r,y}$ to $OPC_{r,y}$.

Impacts

The revision will allow for the accurate calculation of emission reductions.

Subsequent work and timelines

The methodology is recommended by the MP for consideration by the Board at its 103rd meeting. No further work is envisaged.

Recommendations to the Board

The MP recommends that the Board adopt this draft revised methodology, to be made effective at the time of the Board's approval.