Proposed standardized baseline recommendation form (Version 02.1)

INFORMATION TO BE COMPLETED BY THE TWO SELECTED MEMBERS OF THE PANEL/WORKING GROUP OR THE WHOLE PANEL/WORKING GROUP	
Title of the proposed standardized baseline:	Specific CO_2 emissions in Residential Buildings in Republic of Korea
Reference number of the proposed standardized baseline:	PSB0054
Name(s) of the Party or Parties to which the proposed standardized baseline applies:	Republic of Korea
DNA submitting the proposed standardized baseline:	Ministry of Land, Infrastructure and Transport
Name(s) of the proponent(s) of the proposed standardized baseline: *(Parties, project participants, international industry organizations or admitted observer organizations)*	• ECOEYE (Sang-jueon An – Executive Officer) • KAB – Korea Appraisal Board (Ji Changyoon – Research Fellow)
History of the submission:	18/11/2019: Initial submission received 20/01/2020: Initial assessment successfully concluded 06/03/2020: Clarifications requested 14/05/2020: Second submission received 19/06/2020: Additional clarifications requested 22/06/2020: Third submission received
Date (DD/MM/YYYY) when the recommendation is completed:	26/06/2020

Approach(es) for the development of the proposed standardized baseline:

☐ The approach contained in the "Guidelines for the establishment of sector specific standardized baselines"

☐ A methodological approach contained in an approved, proposed new or revised baseline and monitoring methodology (please specify below the exact reference (number, title and version) of the relevant methodology _____)

☒ A methodological approach contained in an approved, proposed new or revised methodological tool *"TOOL31 : Determination of standardized baselines for energy efficiency measures in residential, commercial and institutional buildings", version 01.0*

☐ The approach contained in the "Guideline: Establishment of standardized baselines for afforestation and reforestation project activities under the CDM"

Important conditions under which the proposed standardized baseline is applicable:

The scope of this standardized baseline covers the specific CO_2 emission factor per m^2 for new and existing residential buildings located in the Republic of Korea. It was derived using the "TOOL31: Determination of

standardized baselines for energy efficiency measures in residential, commercial and institutional buildings", version 01.0 (hereinafter referred as "TOOL31"). It is based on data vintage from 2016-2018 which is in compliance with the provisions from the standard "Determining coverage of data and validity of standardized baselines", version 2.0.

Clean development mechanism (CDM) project activities and programmes of activities (hereinafter referred as project activities) can apply this standardized baseline under the following conditions:

(a) The project activity is located in any one or more of the following climatic regions from the Republic of Korea: (a) the Central; (b) Southern; (c) Jeju

(b) The project activity is implemented only in new or existing residential building units where:

  (i) Existing residential building units are those that have finalized construction prior to 31 December 2013;

  (ii) New residential building units are those that have finalized construction from 01 January 2014 onwards.

(c) Commercial and institutional building units are not covered in this standardized baseline;

(d) The building units included in the project activity can be classified into three different categories of gross floor area (GFA): A60 (GFA $\leq$ 60m^2), B85 (60 m^2 < GFA $\leq$ 85 m^2) and C85 (GFA > 85m^2);

(e) The building units included in the project activity shall not be supplied with heat from a district heating system or from a building central heating system[1];

(f) The CDM approved methodology that is applied to the project activity allows the determination of the specific CO_2 emission factor(s) per m^2 through the application of TOOL31;

Project participants who do not wish to use this standardized baseline may alternatively estimate their own values for specific CO_2 emission per m^2, by applying the latest applicable version of the TOOL31.

Summary description of the proposed standardized baseline:

This standardized baseline provides values for the specific CO_2 emissions per m^2 for **existing building units** in table 1 and **new building units** in Table 2.

Table 1. Specific CO_2 emission factor per m^2 for the EXISTING residential building units in the Republic of Korea

Parameter	Climatic Region	Residential building unit GFA category	Specific CO2 emission factor (tCO_2/m^2.year)
$SE_{CO2, Top20\%, i}$	Central	A60	**0.0378**
		B85	**0.0329**
		C85	**0.0271**
	Southern	A60	**0.0336**
		B85	**0.0294**
		C85	**0.0243**
	Jeju	A60	**0.0346**
		B85	**0.0292**
		C85	**0.0264**

[1] The heat supplied to residential building units in Republic of Korea can come from district heating, central heating systems or individual heating systems. As the underlying data of this SB includes only building units with individual heating systems the application is limited to that area.

Table 2. Specific CO_2 emission factor per m^2 for NEW residential building units in the Republic of Korea[2]

Parameter	Climatic Region	Residential building unit GFA category	Specific CO2 emission factor (tCO_2/m^2.year)
$SE_{CO2, Top20\%, i}$	Central	A60	**0.0378**
		B85	**0.0314**
		C85	**0.0271**
	Southern	A60	**0.0336**
		B85	**0.0294**
		C85	**0.0243**
	Jeju	A60	**0.0346**
		B85	**0.0285**
		C85	**0.0264**

Recommendation to the Board:

☒ To approve the proposed standardized baseline

☐ Not to approve the proposed standardized baseline

Reasons for not approving the proposed standardized baseline (if any):

-

Any other issues arising from the review of the proposed standardized baseline:

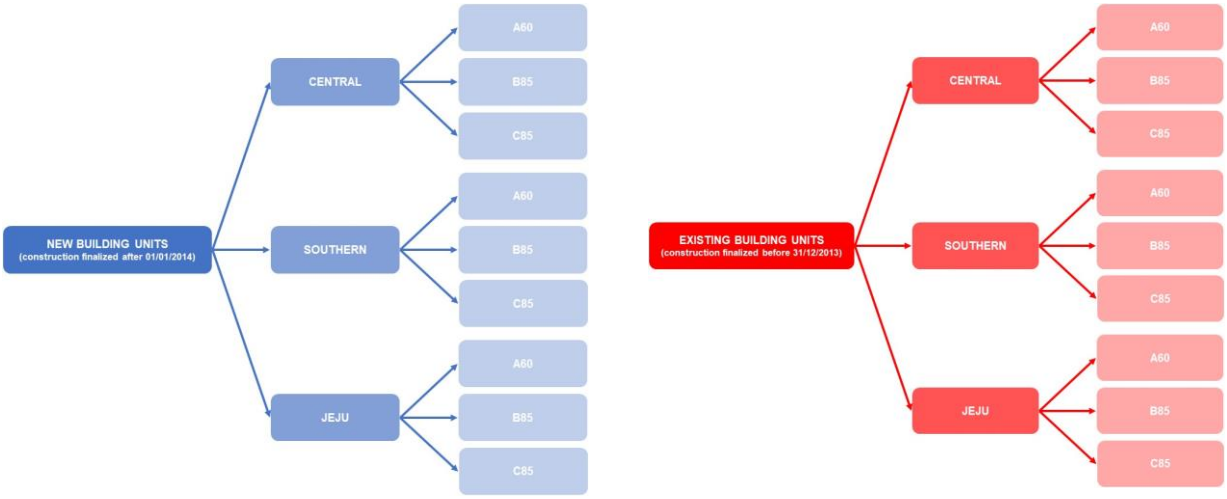
The building categories involved are residential building units with different ranges of GFA (gross floor area) that are determined based on the "Building Act of the Republic of Korea" – A60 (GFA $\leq$ 60m^2), B85 (60 m^2 < GFA $\leq$ 85 m^2) and C85 (GFA > 85 m^2).

The geographical scopes are determined based on the "Energy-saving Design Criteria for Buildings", an official document published by the MOLIT – Ministry of Land, Infrastructure and Transport, that divides the Republic of Korea into three different climatic regions (based on cooling and heating loads) and based on the GFA of the building units that reflect the social-economic condition of residents.

The specific CO_2 emissions of the top-20% best performing buildings was calculated separately for new and existing building units as required by TOOL31. While the TOOL31 allows a sample based approach to data collection, the proponent used a superior approach to data collection by including the whole population of residential building units in the country Republic of Korea, which included over 7 million building units, 5.7 million metering equipment and over 4 billion data points sourced from the 'National Building Energy Database' (NBED). The requirements for data currentness (as per the definition contained in paragraph 10(g) of the TOOL31) is also met as the data vintage used is 2016-2018.

In the initial submission, dated 18 November 2019, the SB values were determined considering the parameters of climatic regions, the provinces and the building unit GFA which lead to a total of 120 values. In the second submission, dated 14 May 2020, the proponent, taking into account inputs from the MP during the workshop "CDM standards and tools for GHG Emissions in the building sector", conducted during MP 81, excluded the parameter "province" since the number of households in some provinces were low (e.g. 6 households in the top-20% for new C85 building units in Chungcheongnam-do, Southern climate) and a pattern or homogeneity was not observed within the provinces unlike the parameter "climatic region". Thus, the aggregation for determining the SB values was based on (i) climatic region and (ii) building GFA range. Eighteen values for specific CO_2 emissions are proposed as illustrated below:

[2] The specific CO_2 emissions of the following existing building categories were conservatively applied to their respective new building categories: Central – A60, Central – C85, Southern – A60, Southern – B85, Southern – C85, Jeju – A60 and Jeju – C85.



Clarifications requested by the Meth Panel to the DNA (06 March 2020 and 19 June 2020) and resolution of the issues raised

The MP reviewed the SB in consultation with the DNA including via an in-meeting workshop ("CDM standards and tools for GHG Emissions in the building sector", conducted during MP 81). Some key issues considered are included below.

1. Clarify the reasons why the specific CO_2 emissions of new C85 building units are higher than the emissions of existing C85 building units.

Response from the proponent on 22/06/2020: This issue was also identified while assessing the data collected and data collection system was reviewed and found to be robust.

In part this is due to behaviour changes of occupants and the affordability for energy services. As evident from Figure 1 below, average GHG emission intensity (GEI) varies differently for electricity and gas consumption for new and existing buildings. The specific heating energy (i.e., specific gas energy usage) of the new building is generally smaller than that of the existing building due to better insulation etc. On the other hand, electricity consumption is mostly due to appliances (84.2%, refer to Table 3 below). New apartments are more expensive than older ones and tend to use more appliances. For this reason, even if an efficient appliance is used, specific electricity consumption increases due to an increase in the number of appliances units.

Additionally, in the case of SB calculation it is important to take into account that there are more existing building units than new building units and the average number of apartment residents in Korea is 2.8, but about 16% of all apartments are occupied by one person (source: data collected from KOSIS – Korean Statistical Information Service, available at http://kosis.kr/statHtml/statHtml.do?orgId=101&tblId=DT_1JU1503&conn_path=I3). Since a single-person apartment uses a relatively small amount of energy, some of these units could fall under the top-20% - as shown in Figure 2 below. For C85 building units in the Central climatic region, the existing building category contains more units with lower $kgCO_2/m^2$ than the new building category, meaning that the result of the SBL is lower despite the high average $kgCO_2/m^2$.

For the specific case of Jeju climatic region, the number of new building units included in the top-20% are significantly small (e.g. there are only 14 new C85 building units).

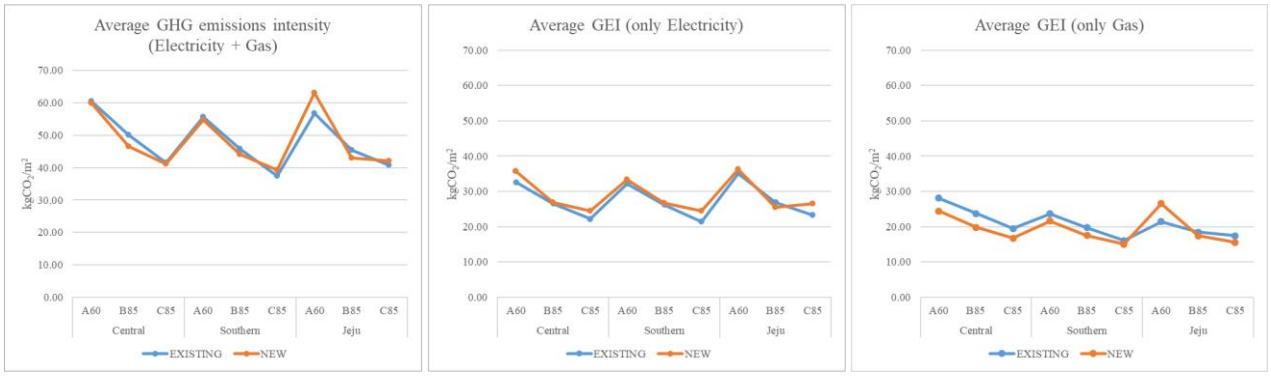


Figure 1. Average GHG Emissions Intensity (GEI) associated with electricity and gas consumed

Table 3. Typical energy usage of residential building units in the Republic of Korea

ENERGY	Use	Consumption (GJ)	Composition (%)	Composition by energy (%)
Electricity	Cooling	1.4	1.9	8.5
	Lighting	1.2	1.7	7.3
	Appliance	13.9	19.2	84.2
	Sum	16.5		100.0
Gas	Heating	32.0	44.3	57.5
	Hot water	17.2	23.8	30.9
	Cooking	6.5	9.0	11.7
	Sum	55.7		100.0
Total		**72.3**	**100.0**	

* Source: Lee and Lee (2011), Practical Application of System for the Minimization of Energy Use: Building Sector, Daejeon Development Institute

Assessment by the Meth Panel:

The MP assessed if the above seen counter intuitive observation, i.e. average specific emission factor for existing building of 0.0306 (STD is 0.0044) slightly lower than that of new buildings calculated as 0.0316 (STD is 0.0048) could be attributed to data collection or parameters for aggregation (see also table 4 to table 6 and figure 2 to figure 4 below for details). Neither of the factors appear to hold and the MP considered that the proponent established the reliability of the data collection method.

Table 4. Analysis of the difference between the specific emissions of new and existing building units in Central climatic region

Climatic Region	Building GFA	SE New (tCO_2/m^2)	SE Existing (tCO_2/m^2)	Difference New - Existing	% difference	Units new	Units existing
Central	**A60**	0.0382	0.0378	0.0004	1.05%	3,760	121,010
	B85	0.0314	0.0329	- 0.0015	- 4.78%	6,984	169,097
	C85	0.0282	0.0271	0.0011	3.90%	1,398	47,739

Table 5. Analysis of the difference between the specific emissions of new and existing building units in Southern climatic region

Climatic Region	Building GFA	SE New (tCO_2/m^2)	SE Existing (tCO_2/m^2)	Difference New - Existing	% difference	Units new	Units existing
Southern	**A60**	0.0346	0.0336	0.0010	2.89%	5,591	129,964
	B85	0.0296	0.0294	0.0002	0.68%	15,471	172,771
	C85	0.0267	0.0243	0.0024	8.99%	1,566	50,216

Table 6. Analysis of the difference between the specific emissions of new and existing building units in Jeju climatic region

Climatic Region	Building GFA	SE New (tCO_2/m^2)	SE Existing (tCO_2/m^2)	Difference New - Existing	% difference	Units new	Units existing
Jeju	**A60**	0.0398	0.0346	0.0052	13.07%	113	471
	B85	0.0285	0.0292	- 0.0007	- 2.46%	192	866
	C85	0.0278	0.0264	0.0014	5.04%	14	238

Table 7. Average and standard deviation of the specific emissions of new and existing buildings in the Republic of Korea

	New building units	Existing building units
AVG	0.03059	0.03164
STDEV	0.00415	0.00451

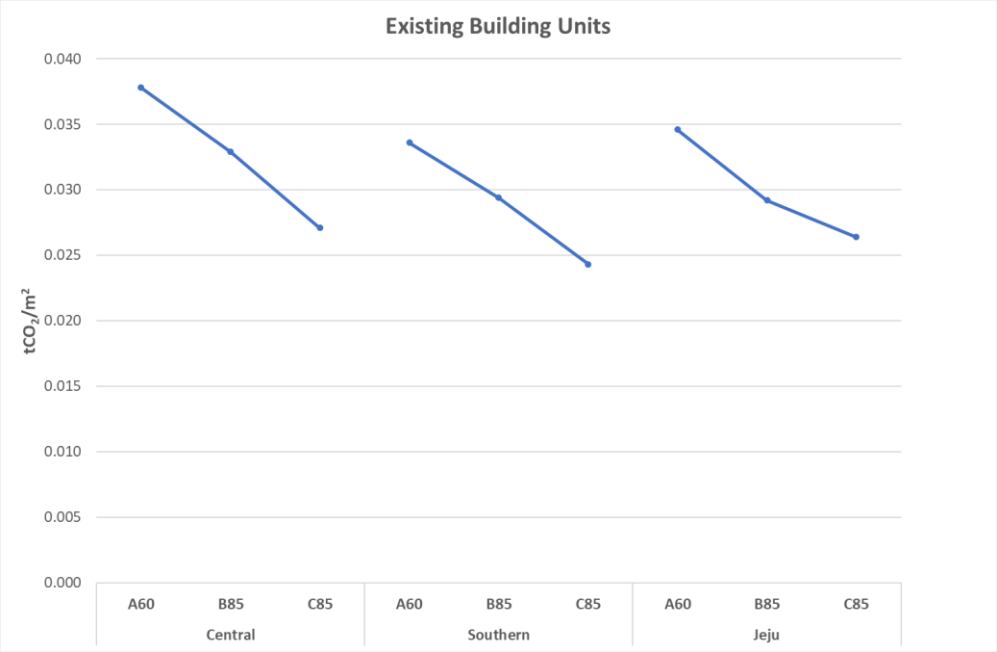


Figure 2. Specific CO_2 emissions of the top-20% best performing existing buildings per climatic region and building GFA category

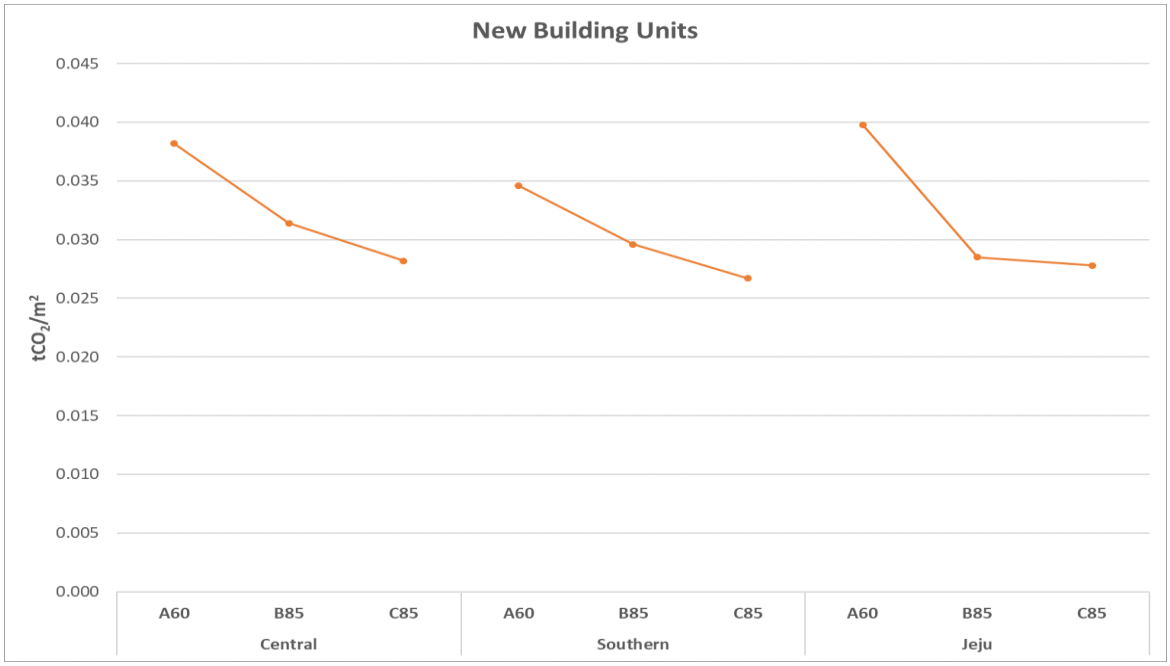


Figure 3. Specific CO_2 emissions of the top-20% best performing new buildings per climatic region and building GFA category

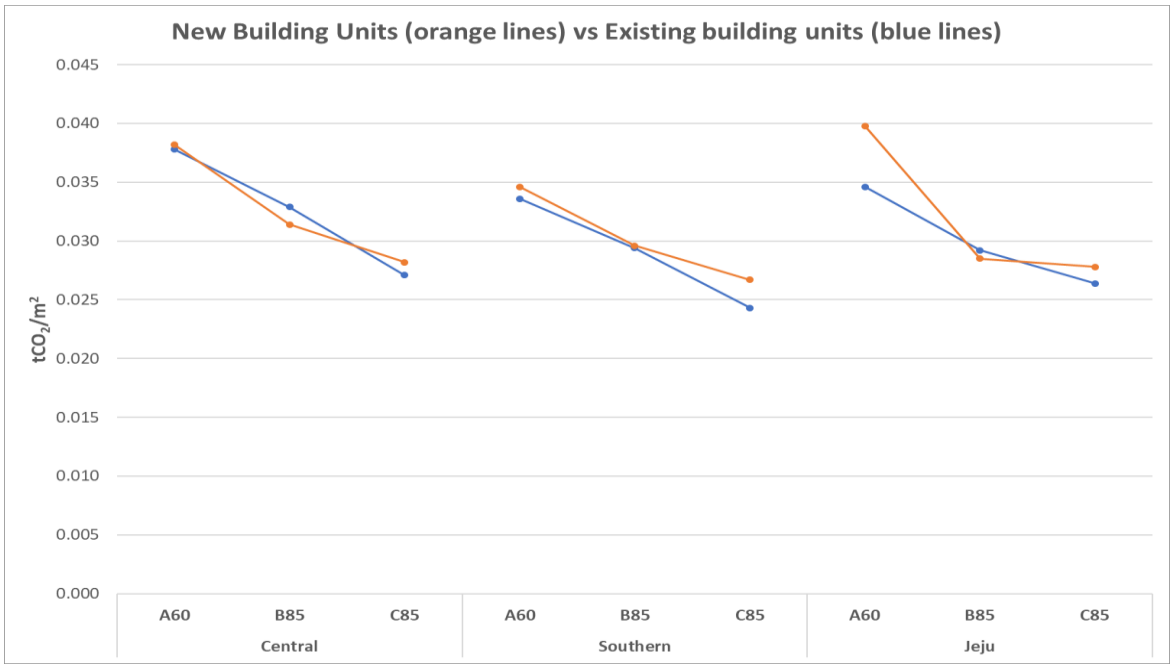


Figure 4. Specific CO2 emissions of the top-20% best performing new and existing buildings per climatic region and building GFA category

In order to assess whether this observation is due to incorrect calculations when following the steps from the TOOL31, the Meth Panel requested the whole set of data (4.4 billion data units) for the population of building units. By applying the filtering process to remove outliers (as explained in the PSB form) and the steps from the TOOL31 to determine the average emissions from the top-20% best performing buildings, the Meth Panel successfully replicated the calculation.

Further the Meth Panel considered the explanation from the proponent for the difference between specific CO_2 emissions of new and existing buildings i.e.:

- The data shows that specific emissions from gas consumption are lower for new buildings compared to existing buildings because new buildings have better insulation performance;

- The data shows that specific emissions from electricity consumption is higher for new buildings

compared to existing buildings because new buildings use more appliances (even if the new appliances have higher efficiency). As observed in Figure 5 below with regard to global buildings sector final energy intensity (final energy used per unit of floor area) changes during 2010-18, specific electricity consumed by appliances decreased less than 5% whereas the specific energy consumed for heating decreased by almost 20%. Moreover, energy intensity of space cooling has increased and many of the cooling equipment may be using electricity.

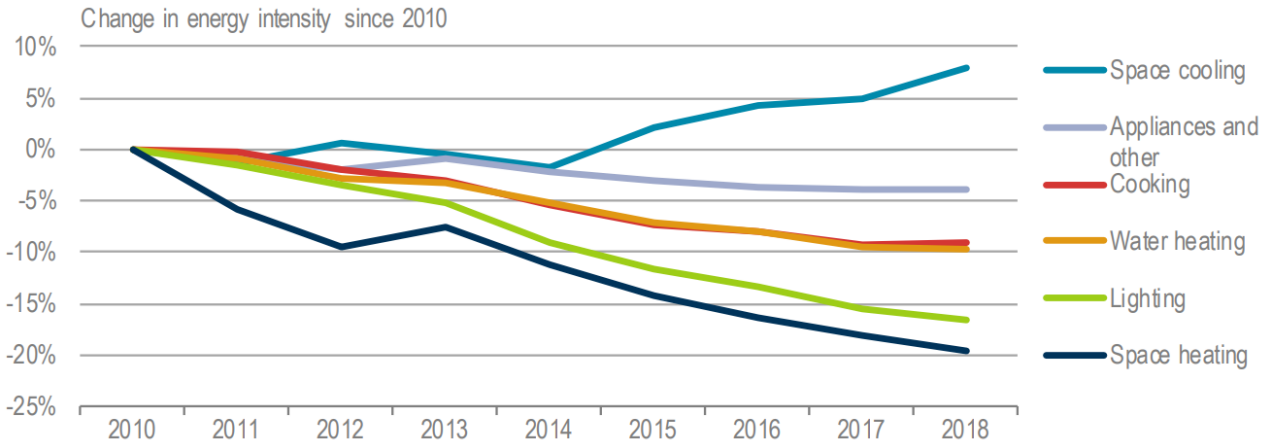


Figure 5. Global buildings sector final energy intensity (final energy used per unit of floor area) changes by end use, 2010-18

* Source: Adapted from IEA (2019a), World Energy Statistics and Balances (database), www.iea.org/statistics and IEA (2019b), Energy Technology Perspectives, buildings model, www.iea.org/buildings

The Meth Panel acknowledged the efforts of the proponent to provide the explanation. While further data such as the average number of occupants of the different building categories, average income of occupants, the number and types of appliances installed, etc. could throw more light on the issue, it would be practically difficult to obtain and assess such data. In that context and to err on the conservative side, the MP recommended that wherever the values of the new buildings are higher than those of existing the former is applied to both new and existing buildings.

In any case the proposed SB values are rigorous and conservative. For example, the building efficiency levels of building units as per the Korean "Building Energy Efficiency Certification" (BEEC) that are included in the SBL are compared. Table 8 provides the specific energy consumption associated with the different energy efficiency levels for residential buildings (in **kWh/m^2 year**) under the BEEC. Table 9 shows minimum BEEC level among all the building units included in this SBL. It is seen that only 1+ and above level buildings comprise the SB and oftentimes it is 1++ and 1+++ level buildings that determine the values of the SB in some provinces.

Table 8. Building Energy Efficiency Certification (BEEC) levels associated with the specific energy consumption ranges

BEEC Level	kWh/m^2.year
1+++	< 60
1++	60 ~ 90
1+	90 ~ 120
1	120 ~ 150
2	150 ~ 190
3	190 ~ 230
4	230 ~ 270
5	270 ~ 320
6	320 ~ 370
7	370 ~ 420

Table 9. Minimum BEEC level of different building units comprising the standardized baseline

			Total Energy Consumed (kWh/m^2)	Building Energy Efficiency Certification (BEEC) Level
Existing	Central	A60	119.23	1+
		B85	103.43	1+
		C85	85.00	1++
	Southern	A60	98.54	1+
		B85	85.90	1++
		C85	71.64	1++
	Jeju	A60	40.53	1+++
		B85	33.28	1+++
		C85	29.33	1+++
New	Central	A60	119.23	1+
		B85	96.24	1+
		C85	85.00	1++
	Southern	A60	98.54	1+
		B85	85.90	1++
		C85	71.64	1++
	Jeju	A60	40.53	1+++
		B85	31.90	1+++
		C85	29.33	1+++

Irrespective, to be on the conservative side, the Meth Panel agreed to recommend that the specific CO_2 emissions of the following existing building categories are also applied to their respective new building categories:

- Central – A60;
- Central – C85;
- Southern – A60;
- Southern – B85;
- Southern – C85;
- Jeju – A60;
- Jeju – C85.

2. Kindly submit the "Enforcement rules of the Energy Act" (Annex 1. Energy calorific value). This document was missing in the resubmission package of documents.

Response from the proponent of the standardized baseline: This document was submitted on 16/03/2020.

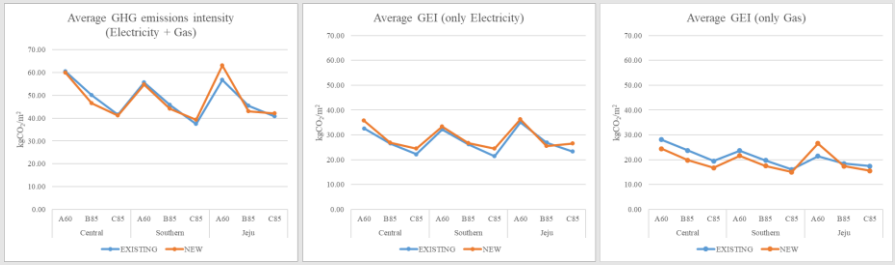
Assessment by the Meth Panel: The document was submitted as requested. Therefore, this issue can be closed.

Table 10. Assessment of the compliance of the proposed SB with the requirements of the TOOL31

Item No.	Requirements of the TOOL31Request for Clarification (CL)	MP/Secretariat assessment	Conclusion (open/closed)
1	**Paragraph 3:** This tool covers the determination of specific CO_2 emissions of baseline buildings, associated with the consumption of electricity, fuel and chilled/hot water by buildings. The tool does not cover emissions associated with replacement of refrigerants.	OK. The proposed SBL determines the specific CO2 emissions of baseline buildings, associated with the consumption of electricity and fuel only (emissions associated with consumption of chilled/hot water are not covered).	Closed
2	**Paragraph 4:** This tool is only applicable to determine the specific CO_2 emissions of baseline buildings based on survey.	OK. The proposed SBL is determined based on the census of residential building units in the Republic of Korea.	Closed
3	**Paragraph 7:** The specific emissions shall be determined for new buildings and/or for existing buildings. The buildings shall: (a) Be classified into different categories. Proponents of the standardized baseline can define their own categories or use some or all of the categories listed in the Appendix; (b) Belong to the same geographical scope, defined by the proponents of the standardized baseline based on their own criterion, taking into account: (i) The climatic zones; and (ii) The social-economic conditions of the area where the buildings are located.	OK. The building categories involved are residential building units with different ranges of GFA (gross floor area) that are determined based on the "Building Act of the Republic of Korea" – A60 (GFA < 60m^2), B85 (60 m^2 < GFA < 85 m^2) and C85 (GFA > 85 m^2). The geographical scopes are determined based on the "Energy-saving Design Criteria for Buildings", an official document published by the MOLIT – Ministry of Land, Infrastructure and Transport, that divides the Republic of Korea into three different climatic regions (based on cooling and heating loads) and based on the GFA of the building units that can reflect the social-economic condition of residents.	Closed
4	**Paragraph 11:** The specific CO_2 emissions are determined based on benchmark using the top-20% best performing buildings. Under this approach, a survey is conducted separately for new and for existing buildings through a sample of similar building units that: (a) Belong to the same building category; and	OK. The specific CO_2 emissions of the top-20% best performing buildings was conducted for separately for new and existing building units, where new buildings are those whose construction was finalized until 31/12/2013 and new building units are those that have finalized construction from 01/01/2014 onwards. In the initial submission, dated 18 November 2019, the different geographical scopes were determined considering the climatic regions, the provinces and	Closed

Item No.	Requirements of the TOOL31Request for Clarification (CL)	MP/Secretariat assessment	Conclusion (open/closed)
	(b) Are located in the same geographical scope.	the building unit GFA which lead to a total of 120 values. In the latest submission, dated 14 May 2020, the proponent of the standardized baseline decided to remove the parameter "province" as one of the criteria to define the geographical scopes since the number of households included in some scopes were low and could not be representative (e.g. 6 households included in the top-20% for new C85 building units in Chungcheongnam-do, Southern climate) and the influence of the factor "province" could be captured by the "climatic region" factor. Therefore, as explained above, the geographical scopes are now determined based on the (i) climatic region and (ii) building GFA range according to the "Energy-saving Design Criteria for Buildings". Therefore, this SBL determines 18 different values for specific CO_2 emissions.	
5	**Paragraph 12:** Data from existing official surveys may be used if the requirements on data currentness, specified in Section 3 above, are met. Data from the buildings is collected either through a census of all the building units or through a survey using a sampling approach. If sampling is used the requirements from the "Stanadrd: Sampling and surveys for CDM project activities and programme of activities" shall be complied with.	OK. The requirements of data currentness are met since the end of the data coverage period (2018) and census of all buildings is conducted.	Closed
6	**Paragraph 13:** The information related to the electricity, fuel and chilled/hot water consumption for new and existing buildings shall be collected following the requirements of data coverage period as specified in Section 3 above	OK. Data of electricity and fuel consumed used to determine this proposed standardized baseline is form 2016, 2017 and 2018.	Closed

Table 11. Findings and resolutions

CL No.	Request for Clarification (CL)	Response by the proponent (RP) MP/Secretariat assessment of the response (Assessment)	Conclusion (open/closed)
1	Clarify the reasons why the specific CO_2 emissions of new C85 building units are higher than the emissions of existing C85 building units.	**RP:** This issue was also identified while assessing the data collected and data collection system was reviewed and found to be robust. In part this is due to behaviour changes of occupants and the affordability for energy services. As evident from Figure 1 below, average GHG emission intensity (GEI) varies differently for electricity and gas consumption for new and existing buildings. The specific heating energy (i.e., specific gas energy usage) of the new building is generally smaller than that of the existing building due to better insulation etc. On the other hand, electricity consumption is mostly due to appliances (84.2%, refer to Table 1 below). New apartments are more expensive than older ones and tend to use more appliances. For this reason, even if an efficient appliance is used, specific electricity consumption increases due to an increase in the number of appliances units. Additionally, in the case of SB calculation it is important to take into account that there are more existing building units than new building units and the average number of apartment residents in Korea is 2.8, but about 16% of all apartments are occupied by one person (source: data collected from KOSIS – Korean Statistical Information Service, available at http://kosis.kr/statHtml/statHtml.do?orgId=101&tblId=DT_1JU1503&conn_path=I3). Since a single-person apartment uses a relatively small amount of energy, some of these units could fall under the top-20%. For C85 building units in the Central climatic region, the existing building category contains more units with lower $kgCO_2/m^2$ than the new building category, meaning that the result of the SBL is lower despite the high average $kgCO_2/m^2$. For the specific case of Jeju climatic region, the number of new building units included in the top-20% are significantly small (e.g. there are only 14 new C85 building units).  **Figure 1. Average GHG Emissions Intensity (GEI) associated with electricity and gas consumed**	Closed

CL No.	Request for Clarification (CL)	Response by the proponent (RP) MP/Secretariat assessment of the response (Assessment)	Conclusion (open/closed)

Table 1. Typical energy usage of residential building units in the Republic of Korea

ENERGY	Use	Consumption (GJ)	Composition (%)	Composition by energy (%)
Electricity	Cooling	1.4	1.9	8.5
	Lighting	1.2	1.7	7.3
	Appliance	13.9	19.2	84.2
	Sum	16.5		100.0
Gas	Heating	32.0	44.3	57.5
	Hot water	17.2	23.8	30.9
	Cooking	6.5	9.0	11.7
	Sum	55.7		100.0
Total		**72.3**	**100.0**	

* Source: Lee and Lee (2011), Practical Application of System for the Minimization of Energy Use : Building Sector, Daejeon Development Institute

Assessment: The MP assessed if the above observed counter intuitive observation, i.e. average specific emission factor for existing building of 0.0306 (STD is 0.0044) slightly lower than that of new buildings calculated as 0.0316 (STD is 0.0048) could be attributed to data collection or parameters for aggregation (see also table 2 to table 4 below for details). Neither of the factors appear to hold and the MP considered that the proponent established the reliability of the data collection method.

Table 2. Analysis of the difference between the specific emissions of new and existing building units in Central climatic region

Climatic Region	Building GFA	SE New (tCO_2/m^2)	SE Existing (tCO_2/m^2)	Difference New - Existing	% diffe-rence	Units new	Units existing
Central	**A60**	0.0382	0.0378	0.0004	1.05%	3,760	121,010
	B85	0.0314	0.0329	- 0.0015	- 4.78%	6,984	169,097
	C85	0.0282	0.0271	0.0011	3.90%	1,398	47,739

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<tr><th>CL No.</th><th>Request for Clarification (CL)</th><th>Response by the proponent (RP)
MP/Secretariat assessment of the response (Assessment)</th><th>Conclusion (open/closed)</th></tr>
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Table 3. Analysis of the difference between the specific emissions of new and existing building units in Southern climatic region

Climatic Region	Building GFA	SE New (tCO_2/m^2)	SE Existing (tCO_2/m^2)	Difference New - Existing	% difference	Units new	Units existing
Southern	A60	0.0346	0.0336	0.0010	2.89%	5,591	129,964
	B85	0.0296	0.0294	0.0002	0.68%	15,471	172,771
	C85	0.0267	0.0243	0.0024	8.99%	1,566	50,216

Table 4. Analysis of the difference between the specific emissions of new and existing building units in Jeju climatic region

Climatic Region	Building GFA	SE New (tCO_2/m^2)	SE Existing (tCO_2/m^2)	Difference New - Existing	% difference	Units new	Units existing
Jeju	A60	0.0398	0.0346	0.0052	13.07%	113	471
	B85	0.0285	0.0292	- 0.0007	- 2.46%	192	866
	C85	0.0278	0.0264	0.0014	5.04%	14	238

Table 5. Average and standard deviation of the specific emissions of new and existing buildings in the Republic of Korea

	New building units	Existing building units
AVG	0.03059	0.03164
STDEV	0.00415	0.00451

In order to assess whether this observation is due to incorrect calculations when following the steps from the TOOL31, the Meth Panel requested the whole set of data (4.4 billion data units) for the population of building units. By applying the filtering process to remove outliers (as explained in the PSB form) and the steps from the TOOL31 to determine the average emissions from the top-20% best performing buildings, the Meth Panel replicated the calculation.

Further the Meth Panel considered the explanation from the proponent for the difference between specific CO_2 emissions of new and existing buildings i.e.:

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</table>

CL No.	Request for Clarification (CL)	Response by the proponent (RP) MP/Secretariat assessment of the response (Assessment)	Conclusion (open/closed)

- The data shows that specific emissions from gas consumption are lower for new buildings compared to existing buildings because new buildings have better insulation performance;

- The data shows that specific emissions from electricity consumption is higher for new buildings compared to existing buildings because new buildings use more appliances (even if the new appliances have higher efficiency). As observed in Figure 52 below with regard to global buildings sector final energy intensity (final energy used per unit of floor area) changes during 2010-18, specific electricity consumed by appliances decreased less than 5% whereas the specific energy consumed for heating decreased by almost 20%. Moreover, energy intensity of space cooling has increased and many of the cooling equipment may be using electricity.

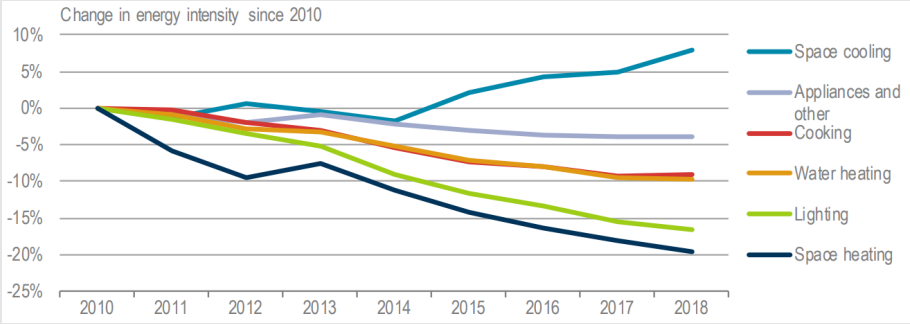

Figure 2. Global buildings sector final energy intensity (final energy used per unit of floor area) changes by end use, 2010-18

* Source: Adapted from IEA (2019a), World Energy Statistics and Balances (database), www.iea.org/statistics and IEA (2019b), Energy Technology Perspectives, buildings model, www.iea.org/buildings

The Meth Panel acknowledged the efforts of the proponent to provide the explanation. While further data such as the average number of occupants of the different building categories, average income of occupants, the number and types of appliances installed, etc. could throw more light on the issue, it would be practically difficult to obtain and assess such data. In that context and to err on the conservative side, the MP recommended that wherever the values of the new buildings are higher than those of existing the former is applied to both new and existing buildings.

Thus, the Meth Panel recommends close this issue and to approve the proposed SB provided

CL No.	Request for Clarification (CL)	Response by the proponent (RP) MP/Secretariat assessment of the response (Assessment)	Conclusion (open/closed)
		that the specific CO_2 emissions of the following existing building categories are conservatively applied to their respective new building categories: • Central – A60; • Central – C85; • Southern – A60; • Southern – B85; • Southern – C85; • Jeju – A60; • Jeju – C85.	
2	Kindly submit the "Enforcement rules of the Energy Act" (Annex 1. Energy calorific value). This document was missing in the resubmission package of documents.	**RP:** This document was submitted on 16/03/2020. **Assessment:** The document was submitted as requested. Therefore, this issue can be closed.	Closed

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Document information

Version	*Date*	*Description*
02.1	1 September 2015	Revision to include an editorial improvement.
02.0	1 December 2013	The document title has changed from “CDM recommendation form for proposed standardized baselines” (F-CDM-PSB-REC) to “Proposed standardized baseline recommendation submission form” (CDM-PSBR-FORM). Revision to: • Reflect updated requirements in the “Procedure: Development, revision, clarification and update of standardized baselines”; • Include an editorial improvement.
01.0	23 March 2012	Initial publication.

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