Assessment Report for CDM proposed standardized baseline (Version 02.0)

*(To be **used** by the **UNFCCC secretariat** in assessing the quality of a proposed standardized baseline only when requested by eligible DNAs.)*

Title of proposed standardized baseline:	**Grid Emission Factor for the Electricity System of the Republic of Armenia for 2016**
Reference of proposed standardized baseline:	PSB0042
Name(s) of the Party or Parties to which the proposed standardized baseline applies:	Republic of Armenia
Name(s) of the proponent(s) of the proposed standardized baseline:	The Designated National Authority (DNA) of the Republic of Armenia
History of the submission & assessment:	1) 17/07/2017: first submission was received • 03/08/2017: initial assessment was finalized and the proposed standardized baseline (PSB) was uploaded on the UNFCCC website. • 22/08/2017: findings were raised in accordance with the requirements of "Guidelines for quality assurance and quality control of data used in the establishment of standardized baselines" (version 2.0) (QA/QC guideline). 2) 19/09/2017: second submission was received • Additional submission was considered to be compliant with the approach used to develop the PSB ("Tool to calculate the emission factor for an electricity system" (version 05.0)). The submission was sufficient to prepare a final recommendation. • 12/10/2017: The draft standardized baseline (DSB) was sent to the DNA, which agreed to recommend the DSB to the Board for approval.

Conclusion:	
(a) The quality assurance and quality control system complied with the provisions and data quality objectives of the valid "Guidelines for quality assurance and quality control of data in the establishment of standardized baselines"	☒ Yes ☐ No ☐ N/A
(b) The approach used by this proposed standardized baseline complied with one of the approaches referred to in the valid "Procedure for development, revision, clarification and update of standardized baselines":	☒ Yes ☐ No One of the four approved approaches: ☐ The "Guidelines for the establishment of sector specific standardized baselines"; ☐ A methodological approach contained in an approved baseline and monitoring methodology; ☒ A methodological approach contained in an approved methodological tool "Tool to calculate the emission factor for an electricity system" (version 05.0); ☐ The "Guideline: Establishment of standardized baselines for afforestation and reforestation project activities under the CDM".
Date when the assessment report is completed:	19/01/2018

SECTION A. Summary of Proposed Standardized Baseline

A.1. Scope and application of the proposed standardized baseline

1. The proposed standardized baseline (PSB) is developed for

   (a) ☐ Additionality demonstration;

   (b) ☐ Baseline identification;

   (c) ☒ Baseline emission estimation

2. This PSB applies to the energy industries sector, which includes electricity generation/ consumption in the Republic of Armenia.

3. Projects shall use the standardized baseline together with the approved methodologies where the "Tool to calculate the emission factor for an electricity system" (version 05.0) (hereinafter referred to as "the tool") is referred.

A.2. Description of the proposed standardized baseline

4. Key data parameters and data sources:

Key data parameters	Data sources
Fuel properties (NCV, emission factor)	For NCV: The "Settlement Center" of the RA Ministry of Energy Infrastructures and Natural Resources (the Center) For EF (lower limit of 95% C.I.): IPCC 2006 Guidelines, Vol. 2, Table 1.4
Fuel consumption	the Center
Electricity generation in the national grid	the Center
Electricity imports/exports	the Center

5. The scope and coverage of the data:

   (a) The PSB identifies, as part of the relevant electricity system:

      (i) 1 nuclear power plant

      (ii) 170 hydropower plants, including two cascades and 168 small HPP

      (iii) 4 thermal power plants

      (iv) 2 cogeneration plants

      (v) 2 wind power plants

      (vi) imports from Iran and Georgia;

   (b) The data include key information of each power plant (name, technology, electricity generation, fuel type/consumption and commissioning data)

   (c) The data represent all regions in the country

   (d) The data represent three years (2014, 2015 and 2016).

6. The DNA uses a data template in accordance with the approved tool.

7. The development of the PSB includes only grid-connected power plants.

8. As the total low-cost/must-run (LCMR) average from 2010 to 2014 is above 50 per cent, Simple Adjusted OM method is applied.

9. The data for 2016 is used for BM calculation.

SECTION B. Summary of Assessment

B.1. Assessment process

10. The purpose of assessment conducted by the secretariat is: i) to ensure that the QA/QC system implemented by the DNA complies with the provisions and data quality objectives of the "Guidelines for quality assurance and quality control of data used in the establishment of standardized baselines" (hereinafter referred to as QA/QC guidelines); and ii) to ensure that the PSB complies with the requirements of the tool.

11. The assessment consisted of the following:

    (a) Review of the documents submitted;

    (b) Identification of issues (assessment findings) and draft of the assessment "findings and resolution" note;

    (c) Communication of assessment findings with DNA and request for their resolution and response;

    (d) Direct communication with DNA*;*

    (e) Review of the additional documents and/or responses provided by DNA;

    (f) Closing the findings;

    (g) Conclusion of the assessment report.

12. A desk review was performed on the following data/information submitted as part of the PSB:

    (a) First submission dated 17/07/2017 included:

        (i) 'Grid Emission Factor for Armenia 2014-2016' standardized baseline report;

        (ii) Proposed standardized baseline form (F-CDM-PSB v1.0);

        (iii) Calculation sheets (confidential);

    (b) Assessment findings were communicated to the DNA on 20/08/2015, in response to which the DNA submitted 19/09/2017 the revised form and additional relevant to findings documents;

    (c) The additional submission was sufficient to prepare a final recommendation.

B.2. Assessment opinion:

13. In accordance with the QA/QC guidelines, the secretariat concluded that the all the following requirements were met by this PSB:

    (a) QC system was implemented to check the data quality before/during/or after data collection. All primary data come directly from the Center. The information regarding plants performance (electricity generation, fuel consumption) is monitored continuously by the Center. The data is archived and maintained in such a way that allow for the reproduction of the calculation of the emission factor of the grid;

    (b) QC activities were clearly documented in the QC report. Data templates were presented to the power sector through which the required data for the GEF calculation and renewal may be maintained and submitted to DNA to facilitate further transparency and quality control;

    (c) All relevant documents and data were available for assessment. The data used in the calculation are available at the Center;

    (d) The data scope was comprehensive enough to produce a "true and fair" representative standardized baseline in the particular sector;

    (e) The key data and information are consistently presented;

(f) The data vintage (three years) was met as per the provisions of the “Tool to calculate the emission factor for an electricity system” (version 05.0);

(g) The assumptions and conservative approaches for data processing and calculations were justified;

14. The details of issues (assessment findings) identified by the secretariat and the responses provided by the DNA are provided in Appendix 1 to this document.

15. The secretariat concluded that the PSB complied with the approach of the tool.

Appendix 1. Findings and resolutions

<table>
<tr><th>CL No.</th><th>Request for Clarification (CL)</th><th>Reference to general provisions of guidelines on quality assurance and quality control of data used for sector-specific standardized baselines</th><th>Responses and corrective actions of DNA</th><th>Conclusion (open/closed)</th></tr>
<tr><td>1</td><td>Power plants' name convention
The names of power plants are not consistent across the documents submitted. For example:
<table><tr><th>Power plants listed in 'Proposed standardized baseline submission form'</th><th>Power plants listed in Excel sheets</th></tr><tr><td>CCGT Unit at Yerevan TPP'</td><td>Yerevan Heat and Power Plant CJSC</td></tr><tr><td>Energy Center at YSMU – CHP Unit</td><td>Yerevan Medical Institute TPP</td></tr><tr><td>Wind Power Plant</td><td>Qajaran Wind Power Plant (Arats LLC)</td></tr></table>
It is requested to revise documents accordingly.</td><td>Consistency (Para 15c) of the QA/QC Guidelines version 2.0.</td><td>Respective revision of the documents is made to ensure consistency of power plants' names across all documents. The following names are used:
1. CCGT Unit at Yerevan TPP
2. Energy Center at YSMU – CHP Unit
3. Qajaran Wind Power Plant (Arats LLC)</td><td>CLOSED</td></tr>
<tr><td>2</td><td>Low cost/Must run (LCMR) power plants
The power plants selected for Operating Margin EF determination are grouped into LCMR power plants and others in accordance with the definition provided in the tool. The justification of the selection is not provided. For example, 'ArmRoscogeneration CJSC' and 'Yerevan Heat and Power Plant CJSC' appear to be cogeneration plants.</td><td>Transparency (Para 15j) of the QA/QC Guidelines version 2.0.
Para 4(g) of the 'Tool to calculate the emission factor for an electricity system'</td><td>Justification of classification of the mentioned power plants into LCMR and no LCMR cohorts is provided in "GEF 2016 Armenia (final)" file.</td><td>CLOSED</td></tr>
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CL No.	Request for Clarification (CL)	Reference to general provisions of guidelines on quality assurance and quality control of data used for sector-specific standardized baselines	Responses and corrective actions of DNA	Conclusion (open/closed)
	However, former is set as a LCMR unit, whereas latter is not without proper explanation. It is requested to justify transparently the assignment of power plants to the LCMR cohort.			
3	**Hydro power plants** According to the Excel sheets, the power system of Armenia includes 168 hydro power plans (HPP). In the 'Proposed standardized baseline submission form' and report 'GEF 2016 Armenia (final).pdf' all hydro power plants are aggregated into three groups: 1. Sevan-Hrazdan CHPPs 2. CountourGlobal Hydro Cascade 3. Small Hydro Power Plants It is requested to provide an exhaustive list of HPP in a transparent manner, by indicating belonging of each HPP to one of the three groups.	Traceability (Para 15k) of the QA/QC Guidelines version 2.0.	An exhaustive list of small HPPs classified as Small Hydro Power Plants is added to 'Proposed standardized baseline submission form' and report 'GEF 2016 Armenia (final). pdf' (see Annex VIII).	Sevan-Hrazdan HPP cascade and CountourGlobal cascade are reported in the submission as one power plant each with 562MW and 404MW installed capacity correspondingly. The rest of HPP, i.e. 168 plants, belong to small HPP group. Therefore, the issue is CLOSED.
4	**Units consistency** 1. Electricity Generated The unit of measurement for electricity generated by power plants is MWh in Excel sheet, whereas 'mln kWh' is used in Step 4 of the 'Proposed standardized baseline submission form'.	Consistency (Para 15c) of the QA/QC Guidelines version 2.0.	1. Respective changes are made to use only MWh as the unit of measurement for electricity.	CLOSED

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	It is requested to use common units of measurements (e.g. MWh) through the documents. 2. <u>Fuel consumed</u> Natural gas consumed at power plants is reported using 'nm^3' as a unit of measurement. It is requested to: • Align units of measurements with the International system of Units (SI), i.e. m^3; • Clarify conditions (i.e. pressure, temperature) the measurements of the fuel consumption were corrected to (e.g. 0 ^{o}C and 1 atm).		2. Cubic meter (m^3) is used as the unit of measurement for natural gas consumption. Also conditions (pressure, temperature) of the measurements of the fuel consumption are added.	
5	**The Build Margin Emission Factor (BM EF)** According to the calculations the 2015 value of the BM EF is 0.3591 tCO2/MWh, whereas table in the Step 6 of the 'Proposed standardized baseline submission form' uses the value of 0.3456 tCO2/MWh. It is requested to correct the inconsistency.	Consistency (Para 15c) of the QA/QC Guidelines version 2.0.	Respective amendment is made in 'Proposed standardized baseline submission form'.	CLOSED
6	**Treatment of the cogeneration units** Emission factors for units that co-generate heat and electricity may not be conservative for baseline emissions estimation, if all fuel used is being allocated to the electricity generation.	Conservativeness (Para 15h) of the QA/QC Guidelines version 2.0.	Information on fuel consumption of cogeneration units is attributable only for electricity generation because produced heat is	Justification provided may not be correct in some cases and can lead to the emission factor overestimation. For

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	It is requested to clarify how fuel consumption has been allocated for cogeneration plants.		considered as a by-product. Commercial contracts of cogeneration units with the national grid consider electricity as the only commercial commodity produced by the units.	this particular case, the conservative approach (option A.2 under Step 4 of the tool) to estimate an emission factor was applied and cross-checked with that provided by the DNA. Application of this conservative option resulted in **no change** in OM EF, BM EF, and CM EF. This is due to the marginal installed capacity of the two cogeneration plants. Therefore, the issue is considered as CLOSED. For the future update of the proposed standardized baseline the DNA is requested to apply option A.2 of the

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				tool to estimate the emission factor of cogeneration plants.

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Document information

Version	*Date*	*Description*
01.0	27 May 2013	Initial publication
02.0	01 June 2015	Modified in order to take into account the Board's decision and improve clarity and consistency

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