Assessment Report for CDM proposed standardized baseline (Version 01.0)

*(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:	Calculation of Grid emission factor for the Electricity System of the Republic of Armenia
Reference of proposed standardized baseline:	PSB0011
Sector:	Electricity generation/consumption sector
Name of DNA:	Republic of Armenia
Dates Reviewed:	First submission was received on March 10, 2014 Initial assessment was finalized on April 03, 2014 First QA/QC assessment was finalized on May 23, 2014 Second submission was received on June 25, 2014. Second QA/QC assessment was done and the final assessment report was prepared on 24 July 2014.

Summary of Proposed Standardized Baseline:

Scope and application of the proposed standardized baseline (SB):

The proposed SB is submitted for a single Host Country, Republic of Armenia, and is developed for the purpose of:

- Baseline emission estimation[1].

The sector to which this proposed standardized baseline applies is the energy generation/consumption sector.

Description of the proposed standardized baseline:

The key data parameters related to this proposed standardized baselines are:

- Total annual electricity generation;
- Net calorific Values (NCV) of fuels;
- Number of hours low cost/must run sources are on the margin;
- Fuel emission factors; and
- Total annual fuel consumption.

The grid emission factor for the Republic of Armenia is determined using the "Tool to calculate the emission factor for an electricity system" (version 04.0.0).

The relevant electricity system is the Armenian power grid which maintains power exchange with the national electricity grid of Republic of Iran and Georgia.

As low cost/must run plants constitute 70.89 per cent of total electricity generation, which is more than 50 per cent of the Armenian grid generation in the average of the five most recent years (2008 – 2012), the Simple Adjusted OM method is selected.

The build margin is calculated using the data for a set of plants whose cumulative share of power generation is equal or more than 20% of the system generation with energy generation in 2012 totaled 2 750 711,7 MWh.

[1] Although Grid Emission Factor is developed for the purpose of estimation of baseline emissions, it is allowed to be used for the estimation of project emissions and leakage emissions by CDM methodologies

Data vintage required is three successive years of plant data (2010 – 2012) for each power plant.

Assessment methodology:

The assessment consisted of the following:

- Initial desk review and findings – first and second rounds of submissions;
- Review of the second round of submission based on initial findings;
- Issue of further findings seeking clarifications;
- Resolution of clarifications;
- Issue of the final assessment report.

Review of documents:

A desk review was performed on the below data/information submitted as part of the proposed standardized baseline.

First submission dated 10 March 2014:

- Proposed standardized baseline (F-CDM-PSB) (version 01);
- Calculation of Grid Emission Factor for the Electricity System of the Republic of Armenia for 2012 dated January 2014;
- Grid emission factor for Armenia (Version 01.0) 12 March 2014;
- Armenia – calculation of grid emission factor.

Second submission dated 25 June 2014:

- Calculation of Grid Emission Factor for the Electricity System of the Republic of Armenia for 2012 dated 25 June 2014;
- Feedback from Public Services Regulatory Commission (PSRC);
- Responses to assessment findings.

All the issues related to QA/QC assessment were resolved in the second submission.

Summary of Assessment:	
Findings related to data collection, process and compilation to establish the proposed standardized baselines are identified in Appendix-1.	
Requirements	**Explanation**
The data quality was checked before/during/or after data collection:	Data quality has been checked during the data collection, aggregation and processing.
(a) QC system (resource/procedure) was implemented.	The QA/QC system applied for data used for the grid emission factor calculations are similar to the system applied for GHG inventory preparation process under the Ministry of Nature Protection of Republic of Armenia. All data are sourced from the national authorized agencies and sectoral ministries. For the calculation of carbon dioxide emissions in power plants data on net calorific values and fuel consumption were provided by the Public Services Regulatory Commission of Republic of Armenia, whereas data on net electricity generation of fuels and number of hours low cost/must run sources are on margin were provided by Settlement Center Close Joint-Stock Company. Since data has been sourced from official sources, it can be concluded that a QA/AC system was available in accordance with 'Guidelines for quality assurance and quality control of data used in the establishment of standardized baselines'.
(b) QC activities was clearly documented (e.g. QC report).	No QC report has been produced/ submitted with this SB, however the QC system used for preparation of national inventory has been applied for deriving the grid emission factor.
Were all required documents and data available for assessment?	All the data were easily available and accessible for assessment.
The proposed standardized baselines were established through consultation processes:	The primary data used for the SB were established through consultation process as explained below.
(a) The sector or data providers were engaged and communicated enough to provide valid inputs/data.	The data used for calculation of the grid emission factor were received from national agencies and sectoral ministries through official requests. The DNA of Republic of Armenia coordinated the process of data gathering.
(b) Stakeholders were invited to provide inputs and comments where applicable.	Since the electricity generation data were made publicly available stakeholders had free access and the opportunity to provide inputs.
(c) The public consultation report was clearly documented if applicable.	Documentation of public consultation report is not required because the data were made publicly available.
The data quality objectives of the QA/QC Guidelines were met. If the QC report is available, this session can be skipped unless further explanation is needed (when conservative approaches were taken, further explanation is required):	The data quality objectives and the requirements of QA/QC guidelines were met as explained below:
(a) Relevant data were used to the establishment of sector-specific standardized baselines.	The key data collected are electricity generation, fuel consumption per type of fuel, NCV of each fuel which were documented in an aggregated manner.

	(1)Electricity generation was measured using calibrated and certified meters located at each sub-stations where the electricity from power plants is delivered to the national electricity grid. Cross-checking of the data obtained from the Settlement Center Close Joint-Stock Company against the data of the electricity purchaser Armenian Electric Network was conducted. (2) Fuel consumption was measured using meters certified as per relevant national standards. The data for fuel consumption were cross-checked with energy bills and cross-verified using the fuel efficiency of power plants. (3) The NCV for the fuel used in each power plant were measured by specialized certified laboratories and provided by Public Service Regulatory Commission of Republic of Armenia. Based on the above justification from SB developers it can be concluded that the relevant data is used in SB.

(b) The data scope was comprehensive enough to produce “true and fair” representative standardized baselines in the particular sector.	The comprehensiveness of the data scope to produce “true and fair” representative standardized baseline by applying a clear procedure (explained in steps below) with the aim of only capturing data and information which would be representative and credible with regard to emissions associated with the electricity generation. **Step 1: Selection of the scope of data to be collected** The data for all existing grid-connected plants in Republic of Armenia were collected by the DNA from authoritative sources. Data included electricity generation, types of fuels used and quantity of fuels and net calorific factors of fuels for the period 2010 - 2012. **Step 2: Collection of data** The data were collected in a centralized manner by DNA by sourcing the data from Public Service Regulatory Commission of Republic of Armenia for the net calorific values and fuel consumption and from Settlement Center Close Joint Stock Company for the net electricity generation of fuels and number of hours low cost/must run sources are on margin. **Step 3: Review of data** The aggregated data received from Public Service Regulatory Commission of Republic of Armenia and from Settlement Center Close Joint Stock Company Central Electricity Board were counter checked and verified by the DNA. QA/QC procedure was conducted by the DNA in accordance with existing procedures for National Inventory of greenhouse gases. **Step 4: Handling of missing data** Nationally applicable emission factors were not available so lower bound default emission factors as per Table 2.2, Chapter 2, Stationary Combustion, IPCC Guidelines for National Greenhouse Gas Inventories (2006) were used in the calculations. Considering the above explanations from SB developers it can be concluded that the data used in SB is complete.
(c) The key data and information are consistently presented.	All data were collected and aggregated into the same format to make the datasets compatible with other related data and to allow comparison. Data derived from all sources have same coverage and currentness and were processed and presented in a consistent way. Based on the explanation from SB developers it can be concluded that the procedure is followed to check the consistency of the data used in SB.
(d) The credibility of the data sources was ensured.	The data collected through measurement were also cross-checked through other means. Data gathering and aggregation was conducted by the DNA from authoritative sources. The data were checked and verified by DNA, which is a

	national entity responsible for collection, compilation, analysis and dissemination of official statistical data in the country. The metered data for electricity generation was cross-checked against invoices for payment of electricity delivered to the grid. The data for fuel consumption which was measured by flow meters or scales was compared with quantities as per the fuel purchase. The data for NCV established through laboratory analyses are comparable with the IPCC default values for the same fuels. Based on the above explanation from SB developers it can be concluded that the data used in SB is credible.
(e) The most recent available data were utilized. If applicable, the pre-determined data vintage was met.	Data vintage covers the period of 2010 – 2012 which can be considered current and therefore the dataset meets the quality objective of currentness as per the requirements of the "Tool to calculate the emission factor for an electricity system". The standardized baseline is to be updated every three years based on recent data available which will ensure data currentness for the future updates. Based on the above justification from SB developers this can be concluded that the most recent available data is used in SB.
(f) Duplications and errors were avoided or corrected.	The DNA collected and processed raw data in accordance with internal QC/QA procedures which addresses the treatment of duplication and errors. With the above explanation from SB developers it can be concluded that the accuracy of the data is justified.
(g) If any, assumptions or interpretations for data processing/ calculations were justifiable.	Based on the information and justification provided by SB developers it can be concluded that the assumptions or interpretations for data processing/ calculations used in SB are justifiable.

(h) The security of datasets including confidentiality was well maintained in accordance with pre-established procedures if requested.	The sources of the data used for the calculations were arrived from publicly available reports and country statistics. Data are presented in an aggregated manner which safeguards the confidentiality of individual power plants. Based on this information submitted by SB developers it can be concluded that the security of data is maintained.
The assessment is concluded successfully, based on the overall evaluation.	The data used for development of SB is meeting the data quality objectives of 'Guidelines for quality assurance and quality control of data used in the establishment of standardized baselines'.

Appendix-1: Findings and resolution

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)
1	On page 6 of the document titled "Calculation of Grid Emission Factor for the Electricity System of the Republic of Armenia for 2012" the respective shares of nuclear, thermal, large and small hydro power plants as well as small power plants (biogas, wind power, cogeneration units) provided 28.76%, 22.56%, 6.33% and 0.36% of total electricity generation in 2012, but the related data source for the establishment of these shares is not included in the submission dated 10/03/2014. The related data source should be made transparent for reference and cross-checks.	Traceability and transparency	Indication to the data source for the establishment of the respective shares of power plants in total generation mix for 2012 has been added on page 6 of the documents. The data source is the Report on Analysis of Technical and Economic Indices of the Armenian Power Energy System for 2012 developed by the "Settlement Center" CJSC. (Table 5 and 7A)	CLOSED – The tables have been scanned and submitted.
2	Data source [2] referenced as "Reports on Analysis of Technical and Economic Indices of the Armenian Power Energy System for 2010, 2011 and 2012. Reports are developed by Settlement Center CJSC under the Ministry of Energy and Natural Resources of RA in 2011-2013" relates to the source of data in many of the tables of the submission dated 10/03/2014, but could not be located from any web search and within the submitted documents for this proposed standardized baseline. In order to trace the data included in the submission data source [2] needs to be submitted.	Traceability and Transparency	Reports on Analysis of Technical and Economic Indices of the Armenian Power Energy System for 2010, 2011 and 2012 are not open for general public. Hard copies of the mentioned reports have been provided to the DNA by the "Settlement Center" for the purpose of calculation of GEF. Scans of the relevant pages of the Reports can be provided (in Russian and Armenian) to the CDM Team.	CLOSED – Scans of the relevant pages were provided
3	Data sources for the parameters in Tables 17 and 18 of the document titled "Calculation of Grid Emission Factor for the Electricity System of the Republic of Armenia for 2012" such as fuel consumption, emission factors and delivery of electricity should be provided.	Traceability and Transparency	Respective changes have been made in the Report and indications of data source have been added. Additional explanatory comments	CLOSED

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)
			were added. Data on delivery of electricity were taken from the Report on Analysis of Technical and Economic Indices of the Armenian Power Energy System for 2012 (Table 5 and 14) and was clarified during a number of interviews with Director and Deputy Director of the "Settlement Centre" CJSC. The letter from the Public Services Regulatory Commission with data on fuel consumption and caloric values of the fuel was received upon the request of DNA. The non-official translation can be provided.	
4	It should be justified why facilities EC at YSMU, ArmRoscogeneration, Erferez OJSC, Lus Astgh Sugar that are using natural gas are listed as low cost/must run power plants for 2012	Traceability and Transparency	Clear explanation on why 5 CHP units (including facilities EC at YSMU, ArmRoscogeneration, Erferez OJSC, Lus Astgh Sugar operated on natural gas) have been listed as low-cost/must run power plant is given in the Report (page 25). Please also see the footnote N10.	CLOSED
5	The basis for the calculation of lambda factor for 2010 – 2012 needs to be elaborated including sources of the hours for which low cost /must run sources are on the margin.	Traceability and Transparency	The basis for the calculation of lambda factor for 2010 – 2012 is given in MS Excel model (see "Data EP" sheet).	CLOSED

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)
6	As per paragraph 12 of the "Guidelines for QA/QC of data used in the establishment of standardized baseline", the DNAs should develop a QA/QC system that outlines QA/QC activities, processes, schedule and responsibilities. Whereas, it is not expected to keep documented QA/QC system, the principles established to implement the general provisions and data quality objectives of "Guidelines for QA/QC of data used in the establishment of standardized baseline" should be known and followed. Therefore the DNA should provide information on the QA/QC system that was implemented to assure itself of the quality of data and information included in the proposed standardized baseline with respect to this submission.	Quality assurance/ quality control	The QA/QC system applied for reference data, emission factors applied are similar to the one applied for GHG Inventory preparation process under the Ministry of Nature Protection of RA. The reference data are received from the national authorized agencies, sectoral ministries through official requests and are signed and sealed. All received letters as reference documents are archived and are available from the DNA contact person. In case the explanation is not sufficient please advise if other details are needed.	CLOSED
7	Delineation of the grid should be provided as required by the paragraph 16 of the"Tool to calculate the emission factor for an electricity system"	Completeness	According to reports of the "Settlement Centre" CJSC for 2011, 2012, 2013 the criteria set in point (b) of the paragraph 16 of the "Tool to calculate the emission factor for an electricity system" is fully met and therefore there are no transmission constraints. In particular, from the last three years the transmission line operated at 89 per cent of its rated capacity (the maximum rate for three years)	CLOSED - Scans of the relevant pages of the report

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			only one month which makes 8.3 per cent of the hours of the year. In addition, there are no legal restrictions for international electricity exchange through the transmission lines between neighboring countries. There is Agreement on electricity exchange between Armenia and Iran and Armenia Georgia.	

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Document information

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