Climate project methodology № 0005

ENERGY EFFICIENCY AND FUEL SWITCHING MEASURES FOR BUILDINGS (SMALL-SCALE)

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Contents

1. Terms and Definitions

1. The following definitions apply for the purpose of this methodology[1]:

(a) **B-settings (Building settings)**[2] refer to physical base properties of a building as below:

(i) Building envelope (e.g. dimensions and building geometry, location of building surfaces such as windows, doors and skylights, orientation of external surfaces, building shades and shading from nearby objects, relative position of the building thermal zones);

(ii) Thermal properties (layer-by-layer description of the building materials with their conductivity, specific heat and density).

(b) **Building** - a three-dimensional building system that has above-ground and (or) underground parts, including premises, engineering and technical support networks and systems and is intended for living and (or) activities of people, locating production, storage of products or keeping animals[3];

(c) **Buildings, constructions and premises for public purposes** - buildings and constructions for facilities serving the country population, buildings for public facilities, as well as multifunctional buildings (premises), see Appendix 1[4];

(d) **Building Energy Management Systems (BEMS)** – a building energy management system includes the collection, recording, alarming, reporting and analysis of energy consumption data, etc. The system is designed to reduce energy consumption, increase its usefulness, reliability and predict the performance of technical building systems, as well as optimize energy consumption and reduce their cost**Ошибка! Закладка не определена.**;

(e) **Chilled water**[5] - water or water mixture that circulates through an evaporator unit, where it is cooled by a refrigerant as the latter evaporates. The chilled water in turn circulates to the applications that need to be cooled (e.g. space in buildings), where it exchanges heat, and is re-circulated back to the evaporation unit;

[1] When using the regulations and sets of rules referenced in this methodology, it is recommended to check the validity of reference documents in the public information system - on the official website of the federal executive body in the field of standardization on the Internet or according to the annual information index "National Standards".

[2] National standard of the Russian Federation GOST R 54862-2011 “Energy efficiency of buildings. Methods for determining the impact of automation, management and operation of a building ”(approved by order of the Federal Agency for Technical Regulation and Metrology of 15.12.2011 № 1567-st)

[3] Federal Law of December 30.12.2009 № 384-FZ "Technical Regulations on the Safety of Buildings and constructions " article 2, paragraph 2, subparagraph 6 and 24

[4] See: Code of Rules SP 118.13330.2022 Public buildings and constructions SNiP 31-06-2009

[5] It is important for project developer not to confuse chilled water and cold water from the cold water supply system. These emission sources are not accounted for this methodology.

(f) **Cohort of existing buildings** – buildings that have finalized the construction more than five years before the end of the data coverage period;

(g) **Cohort of new buildings** – buildings that have finalized the construction within the five years before the end the data coverage period;

(h) **Construction** - a three-dimensional, planar or linear building system, which has ground, above-ground and (or) underground parts, consisting of load-bearing, and in some cases, enclosing building constructions and designed to perform production processes of various types, store products, temporary stay of people, movement of people and goods;

(i) **Cooling Degree Days (Cooling period degrees-days, CDD)** - A characteristic of the duration of energy use to achieve comfortable conditions during the cooling period[6]. The term is commonly used in calculations related to the energy consumption required to cool buildings;

(j) **Crediting period** – the period in which verified and certified GHG emission reductions or increases in net anthropogenic GHG removals by sinks attributable to a climate project activity, as applicable, can result in the issuance of carbon units. The time period that applies to a crediting period for a climate project activity, and whether the crediting period is renewable or fixed, is determined in accordance with Section 4. Project crediting period of this methodology.

(k) **Data coverage period** – the period for which activity data on the operation of the buildings (i.e. electricity consumed, heat energy consumed, fuel consumed and hot/chilled water consumed) is collected for the establishment or update of a baseline.

(l) **Data currentness** – the time gap between the end of the data coverage period and the complete submission of the estimated baseline (applicable to the conservative baseline estimation approach);

(m) **Gross building floor area** (GFA) - the area occupied by internal walls and partitions of the premises and calculated in accordance with the construction codes[7];

(n) **Heating and hot water supply systems** - the heating and hot water systems (can be both centralized and individual for an individual building) include all the components necessary to supply thermal energy for heating and hot water. They consist of heat sources, heating

[6] SP 370.1325800.2017 Solar Shading Devices in Buildings. Design rules (with Amendments № 1).

[7] SP 55.13330.2011 Code of rules Residential single-apartment houses. Updated edition of SNiP 31-02-2001; SP 54.13330.2016 Code of rules Residential multi-apartment buildings. Updated edition of SNiP 31-01-2003; Code of rules SP 118.13330.2022 Public buildings and constructions SNiP 31-06-2009

devices, water treatment, water heaters, pipelines for transporting thermal energy, hot water and devices for regulating and controlling the temperature of water and heating system[8];

(o) **Heating Degree days (Heating period degrees-days, HDD**) - indicator[9] equal to the product of the difference between the indoor air temperature and the average outdoor air temperature for the heating period[10] by the duration of the heating period. The term is commonly used in calculations related to the consumption of energy required to heat buildings;

(p) **Hot water** - water prepared by heating drinking or process water using thermal energy, and, if necessary, also by cleaning, chemical treatment and other technological operations carried out with water[11].

(q) **Multi-apartment residential building** - a building consisting of two or more apartments, which includes common property, consisting of two or more apartments, including the property specified in paragraphs 1-3 of part 1 of article 36 of the Housing Code, see Appendix 1[12];

(r) **Occupancy** – the average number of residents/users of the building (premises) in a defined period of time (weekdays, weekends and holidays)[13];

(s) **PDD** – Project Design Document that describes project activity;

(t) **Premises** - part of a building or a construction, which has a specific purpose and is limited by building constructions and allocated to a specific user, which can be either a tenant or an owner. If a building (construction) has more than one tenant/owner[14], then the premises is defined as the part of the building leased to one tenant or used by the owner[15]. If the building is used by one tenant/owner, then for the purposes of this Methodology, the premises are equal to the entire building[16];

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[8] GOST 34059-2017. Interstate standard. Engineering networks of buildings and structures internal. Installation of heating, hot and cold water supply systems. General technical requirements; SP 60.13330.2020 Code of Practice for Heating, Ventilation and Air Conditioning

[9] SP 50.13330.2012 Code of Practice for Thermal Protection of Buildings. Revised edition of SNiP 23-02-2003 (as amended №1). It should be borne in mind that the methods of determining the HDD in Russia and other countries are not the same.

[10] SP 124.13330.2012 "Heat networks. Revised edition of SNiP 41-02-2003".

[11] Federal Law № 416-FZ of 07.12.2011 "On Water Supply and Sanitation", Art. 2.

[12] Housing Code of the Russian Federation dated December 29, 2004 No. 188-FZ. (with amendments and additions), Article 15

[13] Building occupancy conditions: (a) year-round use (applicable only to residential buildings of any storey); (b) average use of at least 30 hours per week (applicable only to buildings, structures, and public facilities of any storey)

[14] A tenant/owner can be either an individual, or a group of individuals sharing the same building unit.

[15] Residential building unit is an example. The term residential building unit refers to a single housing unit. Namely, a single family home is one residential building unit while a building with ten apartments has ten residential building units.

[16] Schools are a typical example. As a school is normally occupied by an owner (e.g. municipality), the entire school building, not each classroom, is considered as a building unit in this methodology.

(u) **Residential premises** - isolated premises, which is a real property and is suitable for permanent residence of people (meets the established sanitary and technical rules and regulations, other legal requirements)[17], see Appendix 1[18];

(v) **Single - family house** (residential building) - a separate building, which consists of rooms, as well as auxiliary premises, designed to meet peoples' domestic and other needs related to living in such a building, see Appendix 1;

(w) **T-settings (Building Performance)** refers to the characteristics of the building related to ownership and tenancy, including the internal loads:

(i) Occupancy or average number of people per time period (such as population counts in weekdays, weekends and holidays, assignments to thermal zones);

(ii) Lighting and equipment power density. Data collected may include fixture counts, fixture types, nameplate data from lamps, 24-hour weekday, weekend and holiday schedule of lighting use, characteristics of fixtures for estimating radiative and connective heat flows, thermal zone assignments and diversity of operations;

(iii) Internal load schedules and plug loads, including their counts, nameplate data, usage schedules and diversity of operations;

(iv) Building operations reflecting occupant behaviour:

a. Control temperatures;

b. Window opening;

c. Other related schedules;

d. Actual weather data;

e. Energy consumption (by fuel type) in the first 12 months of building operation;

(v) Building operation associated with the use of a district heating system (heating and hot water supply, if any):

a. Heat supply system (at building inputs)[19];

[17] Housing Code of the Russian Federation dated December 29, 2004 No. 188-FZ. (with amendments and additions), article 16, part 1, paragraph 3

[18] See: SP 55.13330.2011 Code of rules Residential single-apartment houses. Updated version of SNiP 31-02-2001 and SP 54.13330.2016 Code of rules Residential multi-apartment buildings. Updated version of SNiP 31-01-2003 (Multicompartment residential buildings)

[19] The heating system (at the building inlets) can be 2-pipe (supply and return); 3-pipe (heating supply and return, hot water supply) or 4-pipe (heating supply and return, hot water supply and return)

b. Heating system (in the building)[20];

c. Hot water supply system (in building)[21];

d. Temperature schedules specified in the heating contract or in the technical conditions (i.e. maximum temperature in supply and return pipes)[22];

e. Temperature schedule for hot water supply system[23];

f. Circulating pumps in the heating system[24];

g. Start and end dates of the heating season;

h. Interruptions in hot water supply.

(x) **Water Cooled Building Air Conditioning System (chilled water system) -** includes all components needed to provide chilled water-cooling services for buildings. It includes one or more chillers plus auxiliary equipment such as pumps to circulate chilled and condensing water, fans to circulate cooling air in the condenser, associated piping and fans used for cooling in the cooling tower.

2. Scope and applicability

2. The following table describes the key elements of the methodology:

Table 1. Methodology key elements

Typical project(s)	Installation of, or replacement or retrofit of, existing equipment with energy efficiency (e.g. efficient appliances, better insulation) and optional fuel switching (e.g. switch from oil to gas) measures in residential, commercial or institutional buildings
Type of GHG emissions mitigation action	Energy efficiency: Electricity, heat energy and/or fuel savings through energy efficiency improvement. Optionally, use of less-carbon-intensive fuel

[20] Heating system (in the building) may be direct (i.e. without mixing devices), dependent (i.e. mixing through elevator unit or pump) or independent (i.e. through heat exchanger); presence of automatic weather control - yes / no; risers - one-pipe / two-pipe; flow - top / bottom; radiators in the apartments may be equipped with thermostats, valves or with no regulation

[21] Hot water supply system (in the building) may be open (i.e., taking mains water) or closed (i.e., heating of cold water in a heat exchanger: boiler house, central heat exchanger) or in the house itself; availability of temperature control automatics in the hot tap water system - yes / no; with or without circulation pipelines in the basement, risers and apartments; risers - insulated or not; with towel dryers in bathrooms or not

[22] The temperature settings specified in the heating contract or in the technical conditions may be for the heating system (i.e. inlets to the building); for the heating system (i.e. outlets from individual heating substation)

[23] The temperature schedule for the hot water supply system can be, for instance, for the temperature in the flow pipe or the temperature at the outlet of the taps

[24] This parameter can include the number of circulation pumps in the heating system (pcs) and their total capacity (kW); DHW circulation pumps: number (pcs) and total capacity (kW); cold water booster pumps: number (pcs) and total capacity (kW); other energy equipment and its total capacity (kW)

Given methodology is unaffected by applying to GHG programs[25]. If a GHG program is applied[26], then the requirements of this program supplement the requirements of the methodology. This methodology is prepared based on the existing methodology developed under the Clean Development Mechanism of the Kyoto Protocol (AMS.II.E.) and includes its adaptation to the current Russian regulations and standards.

The methodology "Energy efficiency and fuel switching measures for buildings (small-scale)" covers small-scale energy efficiency projects in buildings (premises) and is developed in close cooperation with the methodology "Energy efficiency technologies and fuel switching in new and existing buildings", which in turn covers large-scale projects, providing emissions calculating approaches on a deeper level. Algorithms for calculating greenhouse gas emissions are generally interchangeable. The developer of the project should take into account that despite the similarity of approaches of methodologies, the algorithms of heat accounting in the methodologies are different.

2.1. Scope

3. The scope of this methodology includes project activities that implement energy efficiency measures (including savings of electricity, heat energy and fuel) and/or fuel switching in new or existing residential, commercial or institutional buildings (premises) or group of buildings (premises) – a non-binding detailed list of building categories is presented in Appendix 1.

4. This methodology covers project activities aimed primarily at energy efficiency. Examples include technical energy efficiency measures (such as efficient appliances, better insulation and optimal arrangement of equipment, BEMS – Building Energy Management Systems), electricity, heat energy and/or fuel savings and fuel switching measures (such as switching from oil to gas).

5. The technologies may replace existing equipment or be installed in new facilities and shall not transferred from another project activity.

6. The aggregate energy savings of a single project may not exceed the equivalent of 60 GWh per year.

[25] Greenhouse gas program; GHG program: A voluntary or binding international, national, or subnational system or scheme that inventories, accounts for, and manages GHG emissions, GHG uptake, emission reductions, or increases GHG uptake outside the boundaries of a GHG organization or project (GOST R ISO 14064-2021. National Standard of the Russian Federation. Greenhouse gases. Part 1-3)

[26] An example of GHG programs in Russia - GOST R ISO 14064-1-2021 (accounting and management of GHG emissions at the organization level), GOST R ISO 14064-2-2021 (accounting and management of GHG emissions at the project level), GOST R ISO 14067-2021 (carbon footprint of products); at the international level - the European Emissions Trading System (EU ETS), the Clean Development Mechanism (CDM), GHG reporting standard at the level of the organization / project / product lifecycle and corporate value chain (GHG Protocol), Carbon Verification Standard (Verified Carbon Standard, VCS), Gold Standard (Gold Standard), etc.

2.2. Applicability

7. This methodology is applicable to project activities where it is possible to directly measure and record the energy use within the project boundary (e.g. electricity, heat energy and/or fossil fuel consumption).

8. This methodology is applicable to project activities where the impact of the measures implemented (improvements in energy efficiency) by the project activity can be clearly distinguished from changes in energy use due to other variables not influenced by the project activity (signal to noise ratio).

9. Project activities that involve fuel switching and/or the installation of renewable energy technologies to generate electricity for self-consumption (e.g. rooftop solar PV panels) are eligible under this methodology, if the following requirements are met:

    (a) For fuel switching measures:

        (i) Fuel switching is implemented as part of a package of energy efficiency measures at a single building (premises);

        (ii) To address potential cross-effects between the energy efficiency and fuel switching measures, the baseline for the fuel switching component is set after considering the effects of the implementation of the energy efficiency measures (i.e. the fuels consumed by building in the project activity shall be adjusted taking into account the energy efficient building scenario);

    (b) For renewable energy technologies:

        (i) Emission reductions from installation of renewable energy technologies shall be determined as per an applicable methodology (e.g. Renewable electricity generation for captive use and mini-grid);

        (ii) The electricity consumed from renewable energy technologies and the electricity consumed from the grid or from captive power plant are measured through appropriate and reliable measurement procedures;

        (iii) To address potential cross-effects between the energy efficiency and fuel switching measures, the baseline for the renewable energy technology component is set after considering the effects of the implementation of the energy efficiency measures.

10. The approaches proposed in this methodology are consistent with the conservative approach applied at the international level[27]. In case of changes in legal framework of the Russian Federation, this methodology is subject to revision in order to take into account the relevant changes[28].

2.3. Project boundary

11. The spatial extent of the project boundary encompasses the area covering all the project and baseline buildings (premises). In addition, the spatial extent of the energy supply systems that supply energy to the project and baseline buildings (premises) is included in the project boundary.

12. The spatial extent of an electricity system refers to the group of existing power plants which current electricity generation would be affected by the proposed project activity, and also to the group of prospective power plants which construction and future operation would be affected by the proposed project activity.

13. If the facilities within the project boundary as specified in this methodology are owned by different legal entities (or are under the operational management of different legal entities), then the project documentation should include a description of procedures for eliminating the possibility of double counting in GHG emission reductions potentially achieved as a result of project activities, enshrined in contractual agreements.

3. Baseline methodology

14. The baseline[29] is set conservatively[30] for a business-as-usual activity, taking into account all existing policies and measures, but not considering additional project activities (Business-as-usual model).

15. The project developer may use one of the following approaches to determine the baseline with justification for the appropriateness of the choices[31]:

    (a) best available technologies[32] that represent an economically feasible and environmentally sound course of action;

[27] Methodology AM0091: Energy efficiency technologies and fuel switching in new and existing buildings. Version 4.0.

[28] The project developer should keep in mind that the normative documents given in the text can be changed or canceled

[29] Greenhouse gas baseline, GHG baseline - quantitative reference(s) of GHGemissions and/or GHGremovals that would have occurred in the absence of a GHG project and provides the baseline scenario for comparison with project GHG emissions and/or GHG removals (ISO 14064-2:2019 Greenhouse gases - Part 2)

[30] Calculation of the baseline is considered conservative if the final estimate of emission reductions resulting from project activities will not be overestimated. If there is any doubt, the project developer should better understate the baseline projection.

[31] Approaches to determining baselines are given in Action taken by the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement at its third session (FCCC/PA/CMA/2021/10/Add.1, Article 6, paragraph 4, p. 34, para. 36). URL: https://unfccc.int/sites/default/files/resource/cma2021_10a01E.pdf.

[32] If there are reference documents of the best available technologies (BAT) applicable to the conditions of the planned project, the relevant information and technical BAT reference documents are used.

(b) an ambitious benchmark approach where the baseline is set at least at the average emission level of the 20% best performing comparable activities providing similar outputs and services in a defined scope in similar social, economic, environmental and technological circumstances;

(c) an approach based on existing actual or historical emissions, adjusted downwards by at least 5%, unless otherwise specified in the project methodology.

16. The approaches above provide a framework for general understanding of the ways in which baselines can be defined. A detailed approach to determining the baseline for this type of project is provided in Section 3 and Appendix 3.

17. The level of buildings' (premises') energy consumption should not exceed the legislative requirements for the energy efficiency of buildings of the corresponding categories according to the current legislation.

18. For buildings (premises) of different categories (both new buildings and/or for existing buildings), different specific consumption requirements are established, which are mandatory for all types of buildings, except for individual building. The standards[33] are set and updated by the Ministry of Construction (Minstroy) of the Russian Federation, general requirements are regulated by national regulations.

19. Project developer has the right to use methodologies and CO_2 emissions factors legislatively approved within the territory of the Russian Federation[34]. In this case, the Project Developer must independently determine the most relevant approach and the level at which the methods will be applied, document and justify the applied algorithms for the validation and verification body.

20. The minimum requirements for determining the baseline for climate projects that are implemented and used for issuing carbon units within the territory of the Russian Federation are established in Order of the Ministry of Economic Development of Russia (11.05.2022 № 248) "On approval of the criteria and procedure for classifying projects implemented by legal entities, individual entrepreneurs or individuals as climate projects, the form and procedure for submitting a report on the implementation of a climate project". In other cases, while determining the baseline and

[33] For example, Order of the Ministry of Construction and Housing and Communal Services of the Russian Federation dated 17.11.2017 № 1550/pr "On approval of energy efficiency requirements of buildings, structures, structures", Federal Law No. 384-FZ of 30.12.2009 (as amended on 02.07.2013) "Technical Regulations on the Safety of Buildings and Structures", Federal Law No. 261-FZ of 23.11.2009 (as amended on 14.07.2022) "On Energy Conservation and on Improving Energy Efficiency and on Amendments to Certain Legislative Acts of the Russian Federation" etc.

[34] See the Order of the Ministry of Natural Resources of the Russian Federation (27.05.2022 № 371) "On approval of methodologies for quantifying greenhouse gas emissions and removals of greenhouse gases", Order of the Ministry of Natural Resources of the Russian Federation (16.04.2015 № 15-r) "On approval of guidelines for conducting a voluntary inventory of greenhouse gas emissions in the constituent entities of the Russian Federation", the IPCC Guidelines (2006), the Order of the Ministry of Natural Resources and Ecology of the Russian Federation (29.06.2017 № 330) "On approval of guidelines for quantifying the volume of indirect energy emissions of greenhouse gases"

evaluating emissions, it is recommended to follow the CDM methodologies or other approved programs for the implementation of climate projects at the international level.

21. The approaches proposed in this methodology are consistent with the standardized approach applied at the international level (CDM methodologies).

22. Further steps and algorithms to calculate emissions in a baseline scenario[35] are defined in Section 7 (Project scenario) and Appendix 3.

4. Project crediting period

23. The starting date of project activities is not regulated.

24. A crediting period for emission reduction projects is a maximum of 5 years renewable a maximum of twice, or a maximum of 10 years with no option of renewal.

25. The crediting period begins no earlier than 5 years prior to applying for validation for projects validated until December 31, 2025, and no earlier than 2 years prior to applying for validation for projects validated after January 1, 2026.

26. The additionality and baseline shall be evaluated at the beginning of the crediting period and confirmed or reevaluated at the beginning of the next 5-year phase if the project is conducted 3 times 5 years each.

5. Additionality

27. Additionality shall be demonstrated using Guidelines №001 Demonstration of the additionality of the project activity[36], taking into account the specifics outlined in this section.

28. Implemented climate projects that are used for issuing carbon units within the territory of the Russian Federation must comply with Article 9 of the Federal Law (02.07.2021 №296-FZ) “On Limiting Greenhouse Gas Emissions”, as well as the criteria established in accordance with the Order of the Ministry of Economic Development of Russia (11.05.2022 № 248) "On approval of the criteria and procedure for classifying projects implemented by legal entities, individual entrepreneurs or individuals as climate projects, the form and procedure for submitting a report on the implementation of a climate project". In other cases, it is recommended to follow the CDM

[35] Baseline scenario - hypothetical reference case that best represents the conditions most likely to occur in the absence of a proposed GHG project (ISO 14064-2:2019 Greenhouse gases - Part 2)

[36] The climate project implemented in the Russian Federation shall comply with Article 9 of the Federal Law (02.07.2021 №296-FZ) “On Limiting Greenhouse Gas Emissions”, as well as the criteria established in accordance with the Order of the Ministry of Economic Development of Russia (11.05.2022 № 248) "On approval of the criteria and procedure for classifying projects implemented by legal entities, individual entrepreneurs or individuals as climate projects, the form and procedure for submitting a report on the implementation of a climate project". Tool №1 has a framework character, giving a general understanding for ways and approaches to demonstrate the additionality of project activities. Methodology (sections 5.1 and 5.2) gives a more specific approach to the Tool's statements in relation to this type of project activity.

methodologies or other approved programs for the implementation of climate projects at the international level.

29. If the project activity is comprised of one or more technologies below, it is automatically additional.

30. Criteria for automatic additionality of small-scale projects:

(a) The following grid-connected renewable electricity generation technologies are included:

(i) Solar thermal electricity generation including concentrating solar power;

(ii) Off-shore wind technologies;

(iii) Marine wave technologies;

(iv) Marine tidal technologies;

(v) Building-integrated wind turbines or household rooftop wind turbines of a size up to 100 kW;

(vi) Biomass internal gasification combined cycle.

(b) The following off-grid electricity generation technologies are included, where the individual units do not exceed the thresholds indicated in parentheses with the aggregate project installed capacity not exceeding the 15 MW threshold[37]:

(i) Micro/pico-hydro (with power plant size up to 100 kW);

(ii) Micro/pico-wind turbine (up to 100 kW);

(iii) PV-wind hybrid (up to 100 kW);

(iv) Geothermal (up to 200 kW);

(i) Biomass gasification/biogas (up to 100 kW).

(c) For Multi-apartment residential buildings:

(i) Installation of control and regulation of heat energy consumption in the heating and hot water supply system, including one of the 2 options:

[37] The 15 MW limit has been retained by the methodology for this project type in order for matching the project activities implemented in the Russian Federation with the project activities under the CDM. The project activity is included in the block of small-scale project activities with a maximum output capacity equivalent to up to 15 megawatts (or an appropriate equivalent) (decision 17/CP.7, paragraph 6 (c) (i)). In this context: «Output» is the installed/rated capacity as indicated by the manufacturer of the equipment or plant, irrespective of the actual load factor of the plant. The installed/rated capacity of renewable electricity generating units that involve turbine generator systems shall be based on the installed/rated capacity of the generator. Projects may refer to MW(p), MW(e) or MW(th), where (p) stands for peak, (e) stands for electric and (th) stands for thermal. As MW(e) is the most common denomination, and MW(th) only refers to the production of heat which can also be derived from MW(e), MW define as MW(e) and otherwise to apply an appropriate conversion factor (FCCC/KP/CMP/2005/8/Add.1).

a. Installation of an automated heating system control unit with weather-dependent regulation of the heating medium parameters in the heating system;

b. Installation of an automated individual heating substation with automatic regulation of coolant parameters in the heating and hot water supply systems.

6. Monitoring plan requirements

31. 100% of the data should be monitored if not indicated otherwise in the table(s) in Appendix 4. Some parameters either need to be monitored continuously during the crediting period or need to be calculated only once for the crediting period, depending on the data. Detailed information about the monitoring parameters for baseline and project scenario is in Appendix 4.

32. All measurements should be conducted with calibrated measurement equipment according to relevant industry standards.

33. All data collected as part of monitoring should be archived electronically and be kept at least for two years after the end of the last crediting period.

34. The calculation of the parameters and emission factors should be documented electronically that should be attached to the PDD. This should include all data used to calculate the emission factors and other parameters. The data should be presented in a manner that enables reproducing of the calculation.

35. Data and parameters monitored during the project activity are listed in Appendix 4.

7. Project scenario

7.1. Emission Reductions

36. The methodology provides three options to determine emission reductions: based on ex-post monitoring of fuel and electricity consumed (Option 1), based on a conservative tCO_2 emission factor per m^2 (Option 2) and based on a conservative value of tCO_2 emissions per occupant of building (Option 3)[38].

37. The calculation of the CO_2 emission factor from the combustion of fossil fuels (for the project as well as for the leakage emissions) should be based on one of the following two Options, depending on the availability of data on the fossil fuel type:

[38] In Russian regulatory documents, other units of measurement may be used in comparison to the calculation formulas proposed by the methodology. In such cases, the project developer needs to perform the recalculation.

(a) Based on the chemical composition of the fossil fuel type (using the weighted average mass fraction of carbon of the fuel and the weighted average density of the fuel);

(b) Based on net calorific value and CO_2 emission factor of the fuel type (using the weighted average net calorific value of the fuel and the weighted average CO_2 emission factor of the fuel).

38. Option (a) should be the preferred approach, if the necessary data is available.

39. Project participants are also allowed to use methodologies and CO2 emissions factors legislatively approved within the territory of the Russian Federation. The recommended approach to determine the grid emission factor is defined in Appendix 6. The recommended approach to determine the indirect energy emissions factor for captive use and mini-grid is defined in Appendix 7.

40. Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation may be calculated differently according to the source of electricity consumption (from the grid, from an off-grid captive power plant, from the grid and (a) fossil fuel fired captive power plant(s)). For examples and further guidelines, it is recommended to refer to CDM tool 05 “Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation”.

41. Project participants are also allowed to use methodologies legislatively approved within the territory of the Russian Federation (including but not limited to the Order of the Ministry of Natural Resources of the Russian Federation (27.05.2022 № 371) “On approval of methodologies for quantifying greenhouse gas emissions and removals of greenhouse gases”, Order of the Ministry of Natural Resources of the Russian Federation (16.04.2015 № 15-r) "On approval of guidelines for conducting a voluntary inventory of greenhouse gas emissions in the constituent entities of the Russian Federation", the IPCC Guidelines (2006), the Order of the Ministry of Natural Resources and Ecology of the Russian Federation (29.06.2017 № 330) "On approval of guidelines for quantifying the volume of indirect energy emissions of greenhouse gases").

7.1.1. Option 1: emission reductions determined based on ex-post monitoring of fuel and electricity consumption

42. Under this option emission reductions are determined as the sum of the emission reductions associated with the savings of electricity, savings of fuel and fuel switching by the project building *j* during the crediting period.

$$ER_y = \sum_j ER_{Elec\ Savings,j,y} + ER_{Heat\ Savings,j,y} + ER_{Fuel\ Savings,j,y} + ER_{Fuel\ Switching,j,y} \quad \text{Equation (1)}$$

Where:

ER_y	=	Emission reductions in year *y* (tCO_2)
$ER_{Elec\ Savings,j,y}$	=	Emission reductions due to electricity savings from the building (premises) *j* in year *y* (tCO_2)
$ER_{Heat\ Savings,j,y}$	=	Emission reductions due to heat energy savings from the building (premises) *j* in year *y* (tCO_2)
$ER_{Fuel\ Savings,j,y}$	=	Emission reductions due to fuel savings from the building (premises) *j* in year *y* (tCO_2)
$ER_{Fuel\ Switching,j,y}$	=	Emission reductions due to fuel switching from the building (premises) *j* in year *y* (tCO_2)
j	=	Each building (premises) included in the project activity

43. Emission reductions from electricity savings are calculated as the difference between the electricity that would have been consumed by the baseline building (premises) ($EC_{BL,j}$) and the electricity consumed by the building (premises) *j* during the crediting period, multiplied by the CO_2 emission factor of the source supplying electricity to the building (premises) *j*.

$$ER_{Elec\ Savings,j,y} = \frac{EC_{BL,j} - EC_{j,y}}{1 - TDL_{elecAVG-k,y}} \times EF_{EL,k,y} \qquad \text{Equation (2)}$$

Where:

$EC_{BL,j}$	=	Electricity that would have been consumed by the baseline building (premises) *j* (MWh), determined as the average electricity consumed over the 3 years prior to the start date of the project activity
$EC_{j,y}$	=	Electricity consumed by the project building (premises) *j* in year *y* (MWh)
$EF_{EL,k,y}$	=	Weighted average CO_2 emission factor of the sources *k* that supply electricity to the building (premises) *j* in year *y* (tCO_2/MWh), excluding renewable energy technologies[39]. If there is no separate monitoring of electricity consumed from different sources or there are no plausible method of distinguishing between the sources, use the source with the lowest CO_2 emission factor
$TDL_{elecAVG-k,y}$	=	Average technical transmission and distribution losses for consuming electricity from source *k* in year *y*

44. The electricity sources *k* can be either an electric grid, a captive power plant or a combination of both. For $EF_{EL,k,y}$, quantitative evaluation of indirect energy emissions and indirect energy emissions factors is based on the recommendations in Appendix 6.

45. If the project involves the installation of solar PV panels to supply electricity to the building (premises), emission reductions from this source shall be claimed under an applicable methodology (e.g. Renewable electricity generation for captive use and mini-grid"), taking into account any potential cross-effects. If the electricity consumed from the solar PV panels and from the source *k*

[39] The recommended approach to determine the grid emission factor is defined in Appendix 6. The recommended approach to determine the indirect energy emissions factor for captive use and mini-grid is defined in Appendix 7.

cannot be measured separately or be distinguished, project participants may determine the electricity consumed from the solar PV panels:

(a) By multiplying the capacity of the solar panel by a conservative default value of twelve per cent (12%) for the annual average value for availability;

46. Emission reductions from heat energy savings are calculated as the difference between heat energy for heating and hot water supply that would have been consumed by the baseline building (premises) ($EHC_{BL,j}$) and the heat energy consumed by the building (premises) *j* during the crediting period, multiplied by the CO_2 emission factor of the heat energy source consumed by the building (premises) *j*.

$$ER_{Heat\ Savings,j,y} = \frac{EHC_{BL,j} - EHC_{j,y}}{1 - TDL_{heat\ AVG-k,y}} \times EF_{heat,k,y}$$ Equation (3)

где:

$EHC_{BL,j}$	=	Heat energy, that would have been consumed by the baseline building (premises) *j* (GJ), representing the average of the heat energy consumption over the 3 years prior to the start date of the project activity
$EHC_{j,y}$	=	Heat energy consumed by the project building (premises) *j* in year *y* (GJ).
$EF_{heat,k,y}$	=	Average CO_2 emission factor of the different sources k, supplying heat energy to the building (premises) *j* in year *y* (tCO_2/GJ) excluding renewable energy. If the project does not monitor the consumption of heat energy separately, use the source with the lowest CO_2 emission factor.
$TDL_{heat\ AVG-k,y}$	=	Average technical transmission and distribution losses for consuming heat from source *k* in year *y*

47. Heat sources k can be either a centralized system of district heating, own boiler house (modular rooftop, etc.), or a combination of both. For $EF_{heat,k,y}$ quantitative determination of the volume of indirect energy emissions of greenhouse gases, as well as the calculation of the coefficient of indirect energy emissions is based on the Order of the Ministry of Natural Resources and Ecology of the Russian Federation 29.06.2017 № 330.

48. If the project involves installation of heat pumps to supply heat to the building (premises), emission reductions from this source shall be declared in accordance with the applicable methodology.

49. Emission reductions from fuel savings are calculated as the difference between the energy content of the fuel that would have been consumed by the baseline building (premises) ($EFC_{BL,j}$) and the energy content of the fuel(s) consumed by the building (premises) *j* during the crediting period, multiplied by the CO_2 emission factor of the fuel consumed by the building (premises) *j*.

$$ER_{Fuel\ Savings,j,y} = \left(ECF_{BL,j} - \sum_{f} ECF_{f,j,y} \right) \times EF_{CO2,AVG-f,y} \quad \text{Equation (4)}$$

Where:

$ECF_{BL,j}$	=	Energy content of the fuel(s) that would have been consumed by the baseline building (premises) *j* (GJ), representing the average of the product between the mass or volume of fuel consumed by the NCV of the fuel in GJ per mass or volume units over the 3 years prior to the start date of the project activity.
$ECF_{f,j,y}$	=	Energy content of the fuel type *f* consumed by the project building (premises) *j* in year *y* (GJ).
$EF_{CO2,AVG-f,y}$	=	Average CO_2 emission factor of the different fuel types *f* that are consumed by the building (premises) *j* in year *y* (tCO_2/GJ). If the project does not monitor the consumption of different fuels separately, use the source with the lowest CO_2 emission factor for $EF_{CO2,AVG-f,y}$.

50. The energy content of the fuel type *f* consumed by the building (premises) j in year *y* is calculated as the product between the mass or volume of fuel consumed and the net calorific value of the fuel.

$$ECF_{f,j,y} = FC_{f,j,y} \times NCV_f \quad \text{Equation (5)}$$

Where:

$FC_{f,j,y}$	=	Quantity of fossil fuel type *f* consumed by the building (premises) *j* in year *y* (mass or volume units)
$NCV_{f,y}$	=	Net calorific value of the fuel type f in year y

51. Emission reductions from fuel switching are determined based on the amount of fuel type *f* consumed by the building (premises) *j* in during the crediting period, multiplied by the NCV of the fuel type *f* and by the difference between the CO_2 emission factors of the baseline fuel *f,BL* and the project fuel *f*.

$$ER_{Fuel\ Switching,j,y} = EFC_{f,j,y} \times \left(EF_{CO2,f,BL} - EF_{CO2,AVG-f,y} \right) \quad \text{Equation (6)}$$

Where:

$EFC_{f,j,y}$	=	Energy content of the fuel type *f* consumed by the project building (premises) *j* in year *y* (GJ)., determined based on the equation (4) above.
$EF_{CO2,f,BL}$	=	CO_2 emission factor of the fuel type *f* consumed by the building (premises) *j* in the baseline (tCO_2/GJ), determined according to the Order of the Ministry of Natural Resources and Ecology of the Russian Federation (29.06.2017 № 330) "On approval of guidelines for quantifying the volume of indirect energy emissions of greenhouse gases".
$EF_{CO2,AVG-f,y}$	=	Weighted average CO_2 emission factor of the different fuel types *f* that are consumed by the building (premises) *j* in year *y* (tCO_2/GJ).

52. The quantity of electricity, heat energy and fossil fuels that would have been consumed by the baseline building (premises) associated with the building (premises) *j* ($EC_{BL,j,}$ $EHC_{BL,j}$ and $EFC_{BL,j}$, respectivelly) are determined separately for projects involving the construction of new buildings and for the retrofit of existing buildings (premises).

53. $EC_{BL,j}$, $EHC_{BL,j}$ and $EFC_{BL,j}$ shall remain fixed throughout the project lifetime if the requirements listed below are met.

(a) For residential buildings (premises), the building (premises)'s *j* average number of occupants per year ($Occupancy_{j,y}$) during the crediting period is between $\pm$20% of the average baseline building (premises)'s *j* occupancy ($Occupancy_{j,BL}$) over the last 3 years prior to the start date of the project activity;

(b) For commercial and institutional buildings (premises), the average yearly operating hours ($h_{OP,y}$) of the unit *j* is at least 30 hours/week;

(c) The Cooling Degrees Days (CDDs) of the region where the building (premises) *j* is located observed during each year of the crediting period (*CDDy*) are within $\pm$ 20% of the average CDD over the last 3 years prior to the start date of the project activity[40] (CDD_{BL});

(d) The Heating Degrees Days (HDDs) of the region where the building (premises) *j* is located observed during each year of the crediting period are within $\pm$ 20% of the average HDD over the last 3 years prior to the start date of the project activity (HDD_{BL});

7.1.1.1. Retrofit of existing buildings (premises)

54. For project activities involving the retrofit of an existing building (premises) *j*, the baseline electricity, heat energy consumed, and the baseline fuel consumed are, respectively, the average electricity, average heat energy and the average energy content of the fuel consumed by the existing building (premises) over the last 3 years prior to the start date of the project activity.

55. The type of fuel consumed by existing buildings *f,BL* shall be documented in the PDD. If the baseline building consumes more than one type of fuel, the parameter $EF_{CO2,f,BL}$ shall represent the weighted average CO_2 emission factor of the different fuels – if the separate monitoring of the different fuels is not possible, $EF_{CO2,f,BL}$ shall refer to the source with the lowest CO_2 emission factor.

56. Sampling described in Appendix 3 can be used to determine $EC_{BL,j}$ $EHC_{BL,j}$ and $EFC_{BL,j}$ only if similar buildings (premises) are included in the sample, where similar buildings are defined in section 7.1.1.2.1 below.

[40] The base temperatures used to determine HDDs and CDDs shall be the same in the baseline and project scenarios.

7.1.1.2. New buildings

57. The baseline electricity, heat energy and fuel consumed by new buildings shall be determined through a sample-based measurement in similar buildings chosen in accordance with section 7.1.1.2.1. below.

58. To determine the electricity (EC_{BL}), heat energy (EHC_{BL}), the quantity of fuel (EFC_{BL}) and type of fuel (f,BL) consumed by a baseline building, the following requirements apply:

(a) Based on documented energy performance and/or equipment performance standard(s), the construction features and type of fuel that would have been consumed by the baseline building.

(b) If there is no equipment performance standard(s) on energy performance[41], the construction features and type of fuel that would have been consumed by the baseline building to feed the computer simulation tool shall be based on:

(i) An opinion provided by a construction company or expert (e.g. a third-party architect or Chartered Engineer);

(ii) An existing building (premises) that:

a. Has been constructed less than 3 years prior to the start date of the project activity;

b. Is used for the same purpose of the project building (premises);

c. Meets the occupancy, CDD and HDD requirements specified in paragraph 53 of the project building (premises);

d. Has a Gross Floor Area (GFA) of $\pm$20% of the project building (premises).

7.1.1.2.1. Sample of Similar Buildings

59. Under this option, the electricity (EC_{BL}), heat energy (EHC_{BL}), the quantity of fuel (EFC_{BL}) and type of fuel (f,BL) consumed by the baseline building are determined based on records of the highest annual electricity and the fuel with the lowest CO_2 emission factor consumed by a sample of similar buildings (premises) whose construction has been finalizer over the last 5 years and that have been occupied at least over the last 3 years.

[41] For example, Order of the Ministry of Construction and Housing and Communal Services of the Russian Federation (17.11.2017 №1550) / pr "On approval of the requirements for the energy efficiency of buildings, constructions, structures". For buildings of different categories, different specific consumption requirements are established, which are mandatory for all types of buildings, except for individual building. The project developer needs to perform the recalculation the units of measurement.

60. Similar buildings (premises) are defined as buildings (premises) that:

(a) Belong to the same building category and that are used for the same purpose of the project building (premises) *j*;

(b) Are located in an area with similar socio-economic conditions to the one in which the project buildings (premises) are located;

(c) Are located in the same city or metropolitan region. If there are no new similar units in the city or metropolitan region, select a similar building (premises) from a region with average temperature and humidity within ±10% of the average temperature and humidity of the region of the project building (premises);

(d) Have a GFA of ±20% of the project building (premises) *j*;

(e) Meets the occupancy requirements specified in paragraph 53 of the project building (premises).

7.1.2. Option 2: emission reductions determined based on a conservative CO_2 emission factor per m^2

61. For project activities that apply a conservative baseline that standardizes the specific CO_2 emissions per m^2, determined based on the Appendix 3, emission reductions are determined separately for new buildings and for existing buildings[42] based on the equation below:

$$ER_y = BE_y - PE_y \quad \text{Equation (7)}$$

Where:

ER_y	=	Emission reductions in year *y* (tCO_2e)
BE_y	=	Baseline emissions in year *y* (tCO_2e)
PE_y	=	Project emissions in year *y* (tCO_2e)

62. BE_y represents the energy that would have been consumed by buildings from the same category *i* and located in the same geographical scope in the absence of the project, and is determined as:

$$BE_y = \sum_i \sum_j \left(SE_{CO2,Top20\%,i} \times GFA_{j,i,y}\right) \quad \text{Equation (8)}$$

Where:

$SE_{CO2,Top20\%,i}$	=	Average specific CO_2 emissions of the top 20 per cent performing buildings (premises) in building (premises) category *i* included in the sample over the applicable data coverage period ($tCO_2/(m^2$ year)). This parameter is determined following the Appendix 3.

[42] The definitions of cohort of new buildings and cohort of existing buildings from the tool shall apply.

$GFA_{j,i,y}$	=	Gross floor area of the project building (premises) *j* in building (premises) category *i* in year *y* (m^2)
j	=	Buildings (premises) included in the project activity
i	=	Building (premises) categories

63. PE_y represents the emissions associated with the consumption of energy by the project buildings in the project scenario, and is determined as:

$$PE_y = \sum_i \sum_j \left(\frac{EC_{j,i,y} \times EF_{elec,y}}{1 - TDL_y} \right) + \left(\frac{EHC_{j,i,y} \times EF_{heat,y}}{1 - TDL_{heat\,y}} \right) + \left(FC_{k,j,i,y} \times NCV_k \times EF_{CO2,k} \right) \quad \text{Equation (9)}$$

Where:

$FC_{k,j,i,y}$	=	Fossil fuel type *k* consumed by the project building (premises) *j* in building (premises) category *i* in year *y* (mass or volume units)
NCV_k	=	Net calorific value of the fossil fuel type *k* (GJ/mass or volume units)
$EF_{CO2,k}$	=	CO_2 emission factor of the fossil fuel type *k* (tCO_2/GJ)
$EC_{j,i,y}$	=	Electricity consumed by the project building (premises) *j* in building (premises) category *i* in year *y* (MWh)
$EF_{elec,y}$	=	Emission factor of the electric grid supplying electricity to the project building (premises) *j* in building (premises) category *i* (tCO_2e/MWh)
$TDL_{elec\,y}$	=	Average technical transmission and distribution losses for providing electricity to the grid to which the project building (premises) *j* in building (premises) category *i* is connected
$EF_{heat,y}$	=	Emission factor of the heat energy consumption to the project building (premises) *j* in building (premises) category *i* (tCO_2e/MWh)
$TDL_{heat\,y}$	=	Average technical transmission and distribution losses for providing heat energy to the grid to which the project building (premises) *j* in building (premises) category *i* is connected

7.1.3. Option 3 emission reductions determined based on a conservative tCO_2 emission factor per occupant

64. For project activities involving residential buildings (premises) only, baseline emissions can be determined by multiplying a conservative CO_2 emission factor per occupants ($SE_{CO2,Top20\%,occ,i}$) by the number of occupants of a residential building (premises) *j* during the crediting period ($Occ_{j,i,y}$), as indicated by the equation below:

$$BE_y = \sum_i \sum_j \left(SE_{CO2,Top20\%,occ,i} \times Occ_{j,i,y} \right) \quad \text{Equation (10)}$$

Where:

$SE_{CO2,Top20\%,occ,i}$	=	Average specific CO_2 emissions of the top 20 per cent performing buildings (premises) in building (premises) category *i* included in the sample over the applicable data coverage period based on the average number of occupants (tCO_2/(person. year))
$Occ_{j,i,y}$	=	Average number of occupants of the project building (premises) *j* in building (premises) category *i* in year *y* (m^2)
j	=	Buildings (premises) included in the project activity
i	=	Building (premises) categories

65. The average specific CO_2 emissions from the top-20% best performing buildings under the building category *i* over the applicable data coverage period for new and existing buildings is determined following the equation below:

$$SE_{CO2,Top20\%,occ,i} = \frac{\sum_j SE_{CO2,Top20\%,occ,j,i,BL}}{J_{i,BL}} \quad \text{Equation (11)}$$

Where:

$SE_{CO2,Top20\%,occ,i}$	=	Specific CO_2 emissions of building (premises) *j* in the top 20% performing buildings (premises) in building (premises) category *i* included in the sample over the relevant data coverage period based on the number of occupants (tCO_2/(person. year))
$J_{i,BL}$	=	Total number of the top 20 per cent performing buildings (premises) of building (premises) category *i* in each of the years of the applicable data coverage period, calculated as the product of the number of baseline buildings (premises) in building category *i* included in the sample and 20 per cent, rounded up to the next integer if it is decimal

66. The specific emissions of baseline building (premises) *j* in building (premises) category *i* included in the sample over the applicable data coverage period are determined following the equation below:

$$SE_{j,i,occ,BL} = \frac{BE_{electricity,j,i,BL} + BE_{heat,j,i,BL} + BE_{fuel,j,i,BL} + BE_{water,j,i,BL}}{Occ_{j,i,BL}} \quad \text{Equation (12)}$$

Where:

$SE_{j,i,occ,BL}$	=	Specific CO_2 emissions of baseline building (premises) *j* in building (premises) category *i* included in the sample over the applicable data coverage period based on the average number of occupants (tCO_2/(person.·year))
$BE_{electricity,j,i,BL}$	=	Baseline emissions from electricity consumption of baseline building (premises) *j* in building (premises) category *i* included in the sample over the applicable data coverage period (tCO_2/year)
$BE_{heat,j,i,BL}$	=	Baseline emissions from heat energy, hot water consumption of baseline building (premises) *j* in building (premises) category *i* included in the sample over the applicable data coverage period (tCO_2/year)

$BE_{fuel,j,i,BL}$	=	Baseline emissions from fossil fuel consumption of baseline building (premises) *j* in building (premises) category *i* included in the sample over the applicable data coverage period (tCO_2/year)
$BE_{water,j,i,BL}$	=	Baseline emissions from chilled[43] water consumption of baseline building (premises) *j* in building (premises) category *i* included in the sample over the applicable data coverage period (tCO_2/year)
$Occ_{j,i,BL}$	=	Average number of occupants living in the baseline building (premises) *j* in building (premises) category *i* included in the sample over the applicable data coverage period (person)

67. $BE_{electricity,j,i,BL}$, $BE_{heat,j,i,BL,}$ $BE_{fuel,j,i,BL}$ and $BE_{water,j,i,BL}$ are determined based on Appendix 3,

68. Project emissions and emission reductions are determined based on section 7.1.2 above mutatis-mutandis.

7.1.4. Risk management

69. As part of the project implementation, it is recommended to develop a risk assessment system with a description of the most likely risks that may arise at all stages of the climate project. For such an assessment, the project developer should develop a detailed matrix with the following information, as a minimum:

(a) the main stages of the implementation of the climate project;

(b) description of the risks that may arise at each stage of the climate project;

(c) description of the probability of occurrence of risks (for this, the rating options low, medium, high or any other understandable numerical scales can be used);

(d) description of the impact of each risk on the results of the entire project (for this, the rating options low, medium, high or any other understandable numerical scales can be used);

(e) description of the period of influence of each risk on the entire climate project;

(f) description of the developed measures to minimize or avoid each type of risks;

(g) description of the time period required for the implementation of each measure that reduces or prevents the occurrence of risks is indicated.

70. The recommended table for completion, reflecting the result of the risk management measures is given in Appendix 5.

[43] It is important for project developer not to confuse chilled water and cold water from the cold water supply system. These emission sources are not accounted for this methodology. See **Chilled water** in Section 1. The use of chilled water (or coolant), as opposed to cold water, implies the use of refrigerants in special water cooling systems of buildings.

8. Leakage assessment

8.1. Leakage

71. According to the Order of the Ministry of Economic Development of Russia dated May 11, 2022 № 248 project activities should not lead to an aggregate increase in greenhouse gas emissions or reduce their absorption levels outside the scope of such activities. At the same time, it is necessary to consider and fully account for if project leaks[44] exist in accordance with the methodology below.

72. If the project activity involves the replacement of equipment, it is necessary to justify and document the absence of leakage due to the possible reuse of the replaced equipment in another activity. The scrapping of replaced equipment must be documented.

73. In case the project activity involves fossil fuel switching measures, leakage resulting from fuel extraction, processing, liquefaction, transportation, re-gasification and distribution of fossil fuels outside of the project boundary shall be considered.

74. Project developer must independently determine the most relevant methods will be applied to estimate leakage, document and justify the applied algorithms for the validation and verification body, including the approaches applied at the international level.

9. Non-permanence risk analysis

75. The section is not applicable to this methodology.

10. Methods to prevent double counting, negative impacts on the environment and society

76. Climate project should demonstrate its compliance with all legal requirements in the jurisdiction where it is located (including but not limited to the Reference list methodologies). Project proponent should question whether there is a risk that their project might result in negative impacts for local communities, biodiversity and the environment. Such projects should not cause an increase in atmosphere, soil, surface and ground water pollution as well as lead to any community conflicts, land tenure issues, forceful evictions, human rights violations, or worsened health and wellbeing due to restricted access to a forest or nature area.

[44] Leakage for a project activity - the net change of anthropogenic emissions by sources of GHGs which occurs outside the project boundary, and which is measurable and attributable to the climate project activity, as applicable. CDM-EB07-A04-GLOS Glossary CDM terms. Version 08.0

77. Efforts should be made to avoid double counting[45] between project areas (project boundaries), between company reporting and reporting on the project, between the reporting of different companies, between the subjects of the Russian Federation and different countries in the case of international transfer of carbon credits. In the latter case, it is necessary to demonstrate that the carbon credits transferred at the international level are excluded from the accounting of the quantitative goals of the defined at the national level contribution of the Russian Federation.

11. Update of the baseline at the renewal of the crediting period

78. The renewal of a crediting period shall be validated and approved following a technical assessment by a validation and verification body to determine necessary updates to the baseline, the additionality and the quantification of emission reductions.

79. The renewal of the crediting period of a registered project activity shall only be granted if The Project Developer can provide evidence that the original project baseline is still valid or has been updated taking account of new data where applicable.

80. Project developer shall update those sections of the project design document (PDD) relating to the baseline, estimated emission reductions and the monitoring plan using an approved baseline and monitoring methodology: the latest approved version of a baseline and monitoring methodology, applied in the original PDD of the registered project activity, shall be used whenever applicable.

81. The demonstration of the validity of the original baseline or its update does not require a reassessment of the baseline scenario, but rather an assessment of the emissions which would have resulted from that scenario.

82. If a review or update of the baseline of a registered project has been made, the Project developer must justify to the validation and verification body of the need to deviate from the approved methodology in order to extend the crediting period.

83. Assessment the validity of the original/current baseline and to update the baseline at the renewal of a crediting period.

84. A stepwise procedure to assess the continued validity of the baseline and to update the baseline at the renewal of a crediting period consists of two steps. The first step provides an approach to evaluate whether the current baseline is still valid for the next crediting period. The second step provides an approach to update the baseline in case that the current baseline is not valid anymore

[45] Double counting: accounting for GHG emissions or removals more than once. Double counting can occur between organizations, i.e. two or more reporting organizations take ownership of the same GHG emissions or removals. Double counting can also occur inside an organization when GHG emissions or removals are taken into account in different categories (this type of double counting should not occur). (ISO/TR 14069:2013 Greenhouse gases - Quantification and reporting of greenhouse gas emissions for organizations - Guidance for the application of ISO 14064-1). See also GOST R ISO 14080-2021. National Standard of the Russian Federation. Greenhouse gas management and related activities. A system of approaches and methodological support for the implementation of climate projects

for the next crediting period. Further details on procedure to the validity of the original/current baseline at the renewal of the crediting period are in The Appendix 2.

12. Normative references

AMS-II.E. Small-scale Methodology. Energy efficiency and fuel switching measures for buildings. Version 12.0. CDM Methodology.

Order of the Ministry of Economic Development of Russia dated May 11, 2022 № 248 "On approval of the criteria and procedure for classifying projects implemented by legal entities, individual entrepreneurs or individuals, as climate projects, the form and procedure for reporting on the implementation of a climate project" (Registered with the Ministry of Justice of Russia on May 30, 2022 № 68642)

GOST R ISO 14064-1-2021. National Standard of the Russian Federation. Greenhouse gases. Part 1. Requirements and Guidance for Quantification and Reporting of Greenhouse Gas Emissions and Absorption at the Organization Level (approved and enacted by Rosstandart Order No. 1029-st dated 30.09.2021)

GOST R ISO 14064-2-2021. National Standard of the Russian Federation. Greenhouse gases. Part 2. Requirements and Guidelines for Quantification, Monitoring and Reporting Documents for Projects to Reduce Greenhouse Gas Emissions or Increase Their Absorption at the Project Level (approved and enacted by Order No. 1030-st of Rosstandart dated September 30, 2021)

GOST R ISO 14064-3-2021. National Standard of the Russian Federation. Greenhouse gases. Part 3. Requirements and Guidance for Validation and Verification of Greenhouse Gas Statements (approved and enacted by Rosstandart Order No. 1031-st of 30.09.2021)

GOST R ISO 14065-2014 National Standard of the Russian Federation. Greenhouse gases. Requirements for greenhouse gas validation and verification bodies for their application in accreditation or other forms of recognition (approved and enacted by Order of Rosstandart of 26.11.2014 № 1869-st)

GOST R ISO 14080-2021. National Standard of the Russian Federation. Greenhouse Gas Management and Related Activities. System of approaches and methodological support for the implementation of climate projects (approved and enacted by Order of Rosstandart No. 1033-st dated 30.09.2021)

GOST R ISO 14066-2013. National Standard of the Russian Federation. Greenhouse gases. Requirements for competence of greenhouse gas validation and verification groups (approved and enacted by Order of Rosstandart of 17.12.2013 № 2274-st)

Order of the Ministry of Natural Resources of Russia dated May 27, 2022 № 371 "On approval of methods for quantitative determination of greenhouse gas emissions and greenhouse gas removals" (from March 1, 2023, except for certain provisions, coming into force on March 1, 2024)

IPCC 2006. Guidelines for National Greenhouse Gas Inventories of the Intergovernmental Panel on Climate Change, 2006 / Edited by S. Iggleston, L. Buendia, K. Miwa, T. Ngara and K. Tanabe. // T.1-5. - IGES// Hayyam. 2006.

Order of the Ministry of Natural Resources of the Russian Federation (16.04.2015 № 15-r) "On approval of guidelines for conducting a voluntary inventory of greenhouse gas emissions in the constituent entities of the Russian Federation"

ISO 6707-1:2020 Buildings and civil engineering works — Vocabulary — Part 1: General terms. IDT. Publication date: 2020-08;

GOST R ISO 6707-1-2020. National Standard of the Russian Federation. Buildings and constructions. General terms (approved and put into effect by Rosstandart Order No. 1388-st dated 12/24/2020)

TOOL01 Methodological tool. Tool for the demonstration and assessment of additionality. Version 07.0.0. CDM Methodology

TOOL03 Methodological tool. Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion. Version 03.0. CDM Methodology

TOOL05 Methodological tool. Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation. Version 03.0. CDM Methodology

TOOL07 Methodological tool. Tool to calculate the emission factor for an electricity system. Version 07.0. CDM Methodology

TOOL19 Methodological tool. Demonstration of additionality of microscale project activities. Version 10.0. CDM Methodology

TOOL21 Methodological tool. Demonstration of additionality of small-scale project activities. Version 13.1. CDM Methodology

TOOL22 Methodological tool. Leakage in biomass small-scale project activities. Version 04.0. CDM Methodology

TOOL31 Methodological tool. Determination of standardized baselines for energy efficiency measures in residential, commercial and institutional buildings. Version 01.1. CDM Methodology

TOOL32 Methodological tool. Positive lists of technologies. Version 04.0. CDM Methodology

CDM-EB50-A30-STAN Standard Sampling and surveys for CDM project activities and programmes of activities. Version 09.0. CDM Methodology

Order of the Ministry of Construction and Housing and Communal Services of the Russian Federation dated 17.11.2017 No. 1550/pr "On approval of Energy efficiency Requirements of buildings, constructions, structures"

Federal Law No. 261-FZ of 11.23.2009 "On Energy Conservation and Energy Efficiency Improvement and on Amendments to Certain Legislative Acts of the Russian Federation"

GOST R 54862-2011 “Energy efficiency of buildings. Methods for determining the impact of automation, management and operation of a building” (approved by order of the Federal Agency for Technical Regulation and Metrology of December 15, 2011 No. 1567-st)

Housing Code of the Russian Federation dated 29.12.2004 № 188-FZ. (with changes and additions)

Code of rules SP 55.13330.2011 Code of rules Residential single-family houses. Updated edition of SNiP 31-02-2001

Code of rules SP 54.13330.2016 Code of rules Residential multi-apartment buildings. Updated edition of SNiP 31-01-2003

Code of rules SP 118.13330.2022 Public buildings and constructions SNiP 31-06-2009

Appendix 1. List of building (premises) categories

This list provides categories of buildings (premises) eligible under this methodology. The list categorizes buildings (premises) based on two criteria: (i) type of a building (premises); and (ii) height of a whole building that the building (premises) belongs to.

Definitions of buildings (premises) types eligible under this methodology are provided below.

1. Buildings and premises for permanent residence of citizens:

(a) **Single - family house** (Detached single-family house) - residential buildings (hereinafter referred to as houses) with no more than three floors, intended for one family (objects of individual housing construction).

(b) **Row houses -** blocked residential buildings, with the number of floors not more than three, consisting of several blocks, the number of which does not exceed ten and each of which is intended for use by one family, has a common wall (common walls) without openings with the neighboring block or neighboring blocks, is located on a separate land plot and has access to a common plot area (residential buildings of blocked development).

(c) **Multi-apartment residential buildings** of any number of floors, including apartment-type dormitories, as well as residential premises that are part of the premises of buildings of other functional purposes (including an apartment building, an apartment building of a gallery type, corridor type and sectional type).

2. **Buildings and constructions** of any number of floors for **facilities serving the country population**:

(a) **Buildings and premises of educational organizations**: organizations of general and vocational education (preschool, general education, vocational education; educational organizations of higher education), educational organizations of additional education and organizations of specialized vocational education (aero clubs, driving schools, defense

educational institutions, etc.), other organizations providing training under general education programs (sports schools, boarding schools, educational camps for children).

(b) **Buildings and premises of healthcare and social services for the population**:

(i) **Medical organizations**: hospitals, outpatient organizations, pharmacies, medical rehabilitation organizations, including those for children, blood transfusion stations, ambulance stations, etc., resort organizations.

(ii) **Social service organizations for the population**: with a hospital, semi-stationary and without a hospital (including boarding houses for the disabled and the elderly, for disabled children, rehabilitation centers, social adaptation centers, etc.

(c) **Buildings and premises** for enterprises and public **service organizations**:

(i) **Retail and small wholesale enterprises**, as well as shopping and entertainment complexes.

(ii) **Catering establishments**.

(iii) **Objects of communal services to the population**.

a. **Public service enterprises** (repair and sewing workshops; laundries, dry cleaners, organizations providing rental services)

b. **Public utilities organizations** designed to directly serve the country population (housing management companies, etc.).

c. **Sanitary service organizations** (baths, hairdressers, public toilets).

d. **Organizations of civil rights**.

(iv) **Communication facilities** intended for direct public service (post offices).

(v) **Transport organizations** designed to directly serve the population:

a. **Station buildings** of all types of transport (air terminals, sea, river, railway stations).

b. **Transport hubs**.

c. **Agencies and offices** (tourist, real estate, ticket offices, insurance, etc.).

(d) **Constructions, buildings and premises for cultural and leisure activities** of the population and religious rites.

(i) **Sports facilities** and premises for sports and recreation, leisure purposes:

a. **Open flat constructions** (sports facilities, football stadiums)

b. **Indoor sports facilities** (arenas, swimming pools, sport clubs, aquaparks etc.)

(ii) **Buildings and premises for cultural and educational purposes** and religious organizations:

a. Libraries, reading rooms, media libraries, archives

b. **Museums, exhibitions, aquariums**, etc.

c. **Religious organizations** for the population

(iii) Entertainment and entertainment organizations

a. **Entertainment organizations** (theaters, cinemas, concert halls, circuses, etc.)

b. Club and leisure and entertainment organizations

(e) Buildings and premises for temporary residence

(i) **Hotels**, including motels, hostels, etc.

(ii) **Recreation and tourism organizations**:

a. **Boarding houses, tourist bases, year-round and summer camps**, including for children and youth, etc.

b. **Organizations for temporary residence** in non-stationary facilities

(f) **Dormitories and dormitories of educational organizations** and social service organizations

(g) **Facilities for pets and animals** without owners (treatment, maintenance and services for animals)

3. Buildings (facilities) of any number of floors of **for the service of public society and the state**

(a) **Buildings of government bodies**, public service buildings

(i) **Buildings of state organizations for public service** (multifunctional centers, territorial bodies of the Social Fund of Russia, social service bodies, labor exchanges)

(ii) **Management bodies** of firms, organizations, enterprises, as well as divisions of firms, agencies, etc.

(b) **Specialized buildings**: credit organizations, courts and prosecutor's office, notarial and legal organizations, law enforcement organizations (tax services, police, customs, correctional institutions, isolation wards, etc.)

4. **Multifunctional public buildings (premises)** of any number of floors.

Appendix 2. Assessment of the validity of the original/current baseline at the renewal of the crediting period

1. This appendix describes a procedure to the validity of the original/current baseline at the renewal of the crediting period.

2. Assessment of the validity of the original/current baseline at the renewal of the crediting period consists of two steps.

3. Assess the validity of the current baseline for the next crediting period.

(a) Assess compliance of the current baseline with relevant mandatory national and/or sectoral policies. If the current baseline is not in compliance with the relevant mandatory national and/or sectoral policies or if it cannot be shown that the policies are systematically not enforced and that non-compliance with those policies is widespread in the country or region, then the current baseline needs to be updated for the subsequent crediting period.

(b) Assess the impact of circumstances. If the new circumstances make a continued validity of the current baseline not plausible, then the current baseline needs to be updated for the subsequent crediting period.

(c) Assess whether the continuation of use of current baseline equipment(s) or an investment is the most likely scenario for the crediting period for which renewal is requested. If the baseline scenario of the project activity is the continuation of use of the current equipment(s) without any investment and the projects proponents or third party(ies) will undertake an investment later, but before the end of a crediting period, then the current baseline needs to be updated for that crediting period or the crediting of emission reductions should be limited to the period before the baseline equipment would cease its operation.

(d) Assessment of the validity of the data and parameters. If any of the data and parameters that were only determined at the start of the crediting period and not monitored during the crediting period are not valid anymore, the current baseline needs to be updated for the subsequent crediting period.

4. If the application of p.a, b, c and d confirmed that the current baseline as well as data and parameters are still valid for the subsequent crediting period, then this baseline, data and parameters can be used for the renewed crediting period. Otherwise, proceed to Step 5.

5. Update the current baseline and the data and parameters.

6. This step is only applicable if any of the above p. a, b, c and/or d showed that the current baseline needs to be updated.

(a) Update the current baseline. Update the current baseline emissions for the subsequent crediting period, without reassessing the baseline scenario, based on the latest approved version of the methodology applicable to the project activity. The procedure should be applied in the context of the sectoral policies and circumstances that are applicable at the time of request for renewal of the crediting period.

(b) Update the data and parameters. If the application of p.d showed that the data and/or parameter(s) that were only determined at the start of the crediting period and not monitored during the crediting period are not valid anymore, project participants should update all applicable data and parameters.

Appendix 3. Determination of conservative baselines

1. This appendix covers the determination of specific CO_2 emissions of baseline buildings, associated with the consumption of electricity, fuel, heat, chilled/hot water by buildings and based on survey. The appendix does not cover emissions associated with replacement of refrigerants.

2. In Russian regulatory documents, other units of measurement may be used in comparison to the calculation formulas proposed by the methodology. In such cases, the project developer needs to perform the recalculation.

3. The specific emissions shall be determined for new buildings and/or for existing buildings. The buildings shall:

   (a) be classified into different categories, listed in the Appendix 1;

   (b) belong to the same geographical scope, defined by project developer based on their own criterion[46], taking into account:

      (i) the climatic zones;

      (ii) the social-economic conditions of the area where the buildings are located.

Determination of the specific CO_2 emissions in buildings (premises)

4. CO_2 emissions can be determined based on one of the three approaches described in Section 3. Here are the principles for determining emissions in accordance with the comparative approach. The specific CO_2 emissions are determined based on benchmark using the top-20% best performing buildings[47]. Under this approach, a survey is conducted separately for new and for existing buildings through a sample of similar buildings (premises) that:

   (a) belong to the same building category; and

   (b) are located in the same geographical scope.

5. Data coverage period: by default, activity data of three years are required.

6. Data currentness: the data currentness shall be no more than two years, the most recent data available shall be used.

[46] Project developer can expand the definition of geographical scope provided proper justifications and evidences.

[47] A detailed approach to identifying the 20% most energy efficient buildings is described in Appendix 3 of the Methodology "Energy efficiency technologies and fuel switching in new and existing buildings".

7. Data from existing official surveys[48] may be used if the requirements on data currentness, specified above, are met. Data from the buildings is collected either through a census of all the buildings (premises) or through a survey using a sampling approach.

8. The information related to the electricity, fuel, heat, chilled/hot water consumption for new and existing buildings shall be collected following the requirements of data coverage period as specified above.

9. The average specific CO2 emissions from the top-20% best performing buildings under the building category *i* over the applicable data coverage period for new and existing buildings is determined following the equation below:

$$SE_{CO2,Top20\%,i} = \frac{\sum_j SE_{CO2,Top20\%,j,i,BL}}{J_{i,BL}}$$

Where:

$SE_{CO2,Top20\%,i}$	=	Average specific CO2 emissions of the top 20 per cent performing buildings (premises) in building (premises) category *i* over the applicable data coverage period (tCO2/(m2.year))
$SE_{CO2,Top20\%,j,i,BL}$	=	Specific CO2 emissions of building (premises) *j* in the top 20% performing buildings (premises) in building (premises) category *i* over the relevant data coverage period (tCO2/(m2. year))
$J_{i,BL}$	=	Total number of the top 20 per cent performing buildings (premises) of building (premises) category *i* in each of the years of the applicable data coverage period, calculated as the product of the number of baseline buildings (premises) in building category *i* and 20 per cent, rounded up to the next integer if it is decimal [49]

10. The specific emissions of baseline building (premises) j in building (premises) category i included in the sample over the applicable data coverage period are determined following the equation below:

$$SE_{j,i,BL} = \frac{BE_{electricity,j,i,BL} + BE_{heat,j,i,BL} + BE_{fuel,j,i,BL} + BE_{water,j,i,BL}}{GFA_{j,i,BL}}$$

Where:

$SE_{j,i,BL}$	=	Specific CO2 emissions of baseline building (premises) *j* in building (premises) category *i* over the applicable data coverage period (tCO2/(m2·year))
$BE_{electricity,j,i,BL}$	=	Baseline emissions from electricity consumption of baseline building (premises) *j* in building (premises) category *i* over the applicable data coverage period (tCO2/year)

[48] For example, data and collections of Rosstat, industry departments, other official surveys

[49] For example, if the sample size is 22, then the number of buildings (premises) that would make up 20% of the most efficient would be 22 x 20% = 4.4, which is rounded to 5.

$BE_{heat,j,i,BL}$ = Baseline emissions from heat energy, hot water consumption of baseline building (premises) *j* in building (premises) category *i* over the applicable data coverage period (tCO2/year)

$BE_{fuel,j,i,BL}$ = Baseline emissions from fossil fuel consumption of baseline building (premises) *j* in building (premises) category *i* over the applicable data coverage period (tCO2/year)

$BE_{water,j,i,BL}$ = Baseline emissions from chilled water consumption of baseline building (premises) *j* in building (premises) category *i* over the applicable data coverage period (tCO2/year)

$GFA_{j,i,BL}$ = GFA of baseline building (premises) *j* in building (premises) category *i* over the applicable data coverage period (m2)

Average baseline CO_2 emissions from electricity consumption

11. The emissions associated with the consumption of electricity are determined based on the specific electricity consumption from different sources by the building (premises) *j* under the building category *i* (new or existing) included in the sample over the applicable data coverage period, multiplied by the emission factor of the source providing electricity to the building (premises) *j*, as follows:

$$BE_{electricity,j,i,BL} = \left(EC_{grid,j,i,BL} \times EF_{grid,j,i}\right) + \left(EC_{captive,j,i,BL} \times EF_{captive,j,i}\right)$$

Where:

$BE_{electricity,j,i,BL}$ = Baseline emissions from electricity consumption of baseline building (premises) *j* in building (premises) category *i* over the applicable data coverage period (tCO2/year)

$EC_{grid,j,i,BL}$ = Grid electricity consumed by the baseline building (premises) *j* in building (premises) category *i* over the applicable data coverage period (MWh/year)

$EF_{grid,j,i}$ = Emission factor of the electric grid supplying electricity to the baseline building (premises) *j* in building (premises) category *i* (tCO2e/MWh). The recommended approach for determining the grid emission factor is given in Appendix 6.

$EC_{captive,j,i,BL}$ = Captive electricity consumption by the baseline building (premises) *j* in building (premises) category *i* over the applicable data coverage period (MWh/year)

$EF_{captive,j,i}$ = Emission factor of the captive power plant(s) supplying electricity to the baseline building (premises) *j* in building (premises) category *i* (tCO2e/MWh). The recommended approach for determining the captive emission factor is given in Appendix 7.

Average baseline CO_2 emissions from fossil fuel consumption

12. The emissions associated with the consumption of different types of fuel are determined based on the sum of the amounts of fuel type k consumed by the building (premises) *j*, under building category *i* (new or existing) included in the sample over the applicable data coverage period, multiplied by the fuel's net calorific value and CO2 emission factor, as follows:

$$BE_{fuel,j,i,BL} = \sum_{k} FC_{k,j,i,BL} \times NCV_k \times EF_{CO2,k}$$

Where:

$BE_{fuel,j,i,BL}$	=	Baseline emissions from fossil fuel consumption of baseline building (premises) *j* in building (premises) category *i* over the applicable data coverage period (tCO2/year)
$FC_{k,j,i,BL}$	=	Amount of fossil fuel type *k* consumed by the building (premises) *j* in building (premises) category *i* over the applicable data coverage period (mass or volume units/year)
NCV_k	=	Net calorific value of the fossil fuel type *k* (GJ/mass or volume units)
$EF_{CO2,k}$	=	CO2 Emission factor of the fuel type k (tCO2/GJ)

Average baseline CO_2 emissions from chilled water consumption

13. The emissions associated with the consumption of chilled water in a chilled water system are determined based on the energy required to produce the chilled water and on the distribution losses of the water distribution network, as follows:

$$BE_{water,j,i,BL} = \frac{WC_{j,i,BL} \times EF_{WP,j,i,BL}}{1 - \eta_{dist,s,BL}}$$

Where:

$BE_{water,j,i,BL}$	=	Baseline emissions from chilled water consumption of baseline building (premises) *j* in building (premises) category *i* over the applicable data coverage period (tCO2/year)
$WC_{j,i,BL}$	=	Energy content of the chilled water consumption in baseline building (premises) *j* in building (premises) category *i* over the applicable data coverage period (GJ/year)
$EF_{WP,j,i,BL}$	=	Emission factor for production of chilled water that is supplied to baseline building (premises) *j* in building (premises) category *i* over the applicable data coverage period (tCO2/GJ)
$\eta_{dist,s,BL}$	=	Average technical distribution losses of the chilled water in chilled water system *s* network serving baseline building (premises) *j* in building (premises) category *i* over the applicable data coverage period (GJ of technical thermal energy losses in the chilled water distribution network divided by GJ of thermal energy supplied to the buildings (premises))

14. The parameter $WC_{j,i,BL}$ can be calculated using heat meters or using mass flow-meters and temperature sensors as indicated in the equations below:

$$WC_{j,i,BL} = m_{j,i,BL} \times \Delta t_{j,i,BL} \times C_m$$

Where:

$m_{j,i,BL}$	=	Mass of chilled water consumption of baseline building (premises) *j* in building (premises) category *i* over the applicable data coverage period (kg/year)

$\Delta t_{j,i,BL}$ = Average temperature difference between the outlet water and inlet water of the cooling system used for the cooling of building (premises) *j* in building (premises) category *i* over the applicable data coverage period (K)

C_m = Specific heat capacity of the chilled water (GJ/(kg°C))

15. If the amount of water is measured using volumetric flow-meters, the mass of water consumed is determined by multiplying the volumetric readings by the density of the water as indicated in the equation below:

$$m_{j,i,BL} = v_{j,i,BL} \times \rho_{H2O}$$

Where:

$v_{j,i,BL}$ Annual chilled water consumption (in volume) of baseline buildings (premises) *j* in buildings (premises) category *I* included in the sample over the applicable data coverage period (m^3/year)

ρ_{H2O} Density of the chilled water (kg/m^3)

16. The emission factor for chilled water production ($EF_{WP,j,i,BL}$) shall be calculated for each chilled water system *s* that supplies the chilled water to the respective building (premises) *j* in building (premises) category *i* included in the sample over the applicable data coverage period, according to the equation below:

$$EF_{WP,j,i,BL} = \frac{(EC_{WP,s,BL} \times EF_{CO2,s,electricity}) + (\sum_f FC_{WP,k,s,BL} \times NCV_k \times EF_{CO2,k})}{m_{s,BL} \times \Delta t_{s,BL} \times C_m}$$

Where:

$EC_{WP,s,BL}$ = Electricity consumed to produce the chilled water system *s* over the applicable data coverage period (MWh/year)

$EF_{CO2,s,electricity}$ = CO2 emission factor of power source to which the chilled water system *s* is connected to (tCO2e/MWh). The recommended approach for determining the grid emission factor is given in Appendix 6.

$FC_{WP,k,s,BL}$ = Amount of fossil fuel type *k* consumed to produce the chilled water system *s* over the applicable data coverage period (mass or volume unit/year)

NCV_k = Net calorific value of the fossil fuel k (GJ/mass or volume unit)

$EF_{CO2,k}$ = CO2 emission factor of the fossil fuel type k (tCO2/GJ)

$m_{s,BL}$ = Mass of chilled water production by chilled water system *s* over the applicable data coverage period (kg/year)

$\Delta t_{s,BL}$ = Average temperature difference between the outlet and inlet of the heat exchanger used for the chilled water production in chilled water system *s* over the applicable data coverage period (°C)

C_m = Specific heat capacity of the chilled water (GJ/(kg°C))

Average baseline CO_2 emissions from heat energy, hot water consumption

17. The emissions associated with heat and hot water consumption in the heating and hot water system based on the primary energy source (fuel type or electrical energy) needed to produce the corresponding amount of heat, and losses during transportation and distribution of heat and hot water in the heating system, as follow:

$$BE_{heat,j,i,BL} = \frac{HC_{j,i,BL} \times EF_{HP,j,i,BL}}{1 - \eta_{dist,s,BL}}$$

Where:

$BE_{heat,j,i,BL}$	=	Baseline emissions from heat and hot water consumption of baseline building (premises) *j* in building (premises) category *i* over the applicable data coverage period (tCO2/year)
$WC_{j,i,BL}$	=	Energy content of the heat and hot water consumption in baseline building (premises) *j* in building (premises) category *i* over the applicable data coverage period (GJ/year)
$EF_{WP,j,i,BL}$	=	Emission factor for production of heat and hot water that is supplied to baseline building (premises) *j* in building (premises) category *i* over the applicable data coverage period (tCO2/GJ)
$\eta_{dist,s,BL}$	=	Average technical distribution losses of the heat energy and hot water system *s* network serving baseline building (premises) *j* in building (premises) category *i* over the applicable data coverage period (GJ of technical thermal energy/hot water losses divided by GJ of thermal energy supplied to the buildings (premises))

18. The parameter $HC_{j,i,BL}$ can be calculated using heat meters or using mass flow-meters and temperature sensors as indicated in the equations below:

$$WC_{j,i,BL} = m_{j,i,BL} \times \Delta t_{j,i,BL} \times C_m$$

Where:

$m_{j,i,BL}$	=	Mass of heat, hot water consumption of baseline building (premises) *j* in building (premises) category *i* over the applicable data coverage period (kg/year)
$\Delta t_{j,i,BL}$	=	Average temperature difference between the outlet water and inlet water of the heating and hot water system used for the heating/hot water of building (premises) *j* in building (premises) category *i* over the applicable data coverage period (K)
C_m	=	Specific heat capacity of the heat, hot water (GJ/(kg°C))

19. If the amount of water is measured using volumetric flow-meters, the mass of water consumed is determined by multiplying the volumetric readings by the density of the water as indicated in the equation below:

$$m_{j,i,BL} = v_{j,i,BL} \times \rho_{H2O}$$

Where:

$v_{j,i,BL}$	Annual heat, hot water consumption (in volume) of baseline buildings (premises) *j* in buildings (premises) category *I* included in the sample over the applicable data coverage period (m^3/year)
ρ_{H2O}	Density of the heat, hot water (kg/m^3)

20. The emission factor for chilled water production ($EF_{WP,j,i,BL}$) shall be calculated based on the Order of the Ministry of Natural Resources and Ecology of the Russian Federation 29.06.2017 № 330.

Appendix 4. Data and parameters monitored.

№	Data / Parameter	Data unit	Description	Source of data	Measurement procedures	Monitoring frequency	QA/QC procedures	Any comment
1.	$EC_{j,y}$ / $EC_{BL,j}$	MWh	ECj,y: Electricity consumed by the project building (premises) j in year y ECBL,j: Electricity that would have been consumed by the baseline building (premises) j	Baseline emissions from electricity consumption and monitoring of electricity generation may be calculated differently according to the sources of electricity consumption (from the grid, from an off-grid captive power plant, from the grid and (a) fossil fuel fired captive power plant(s)). For examples and further guidelines, it is recommended to refer to CDM TOOL05 “Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation”.	Direct measurement or calculated based on measurements from more than one electricity meters.Use electricity meters installed at the electricity consumption sources.	Continuous measurement and at least monthly recording.		Preferably, the consumption of electricity from different sources shall be monitored separately. The parameter ECBL,j does not need to be monitored ex-post, however it shall be determined and fixed ex-ante by following the measurement procedures.

2.	$EF_{EL,k,y}$	tCO2/MWh	Average CO2 emission factor of the sources k that supply electricity to the building (premises) j in year y	(a) Values provided by the fuel supplier in invoices
				This is the preferred source.
				(b) Measurements by the project participants
				(c) Regional or national default values
				These sources can only be used for liquid fuels and should be based on well documented, reliable sources (such as national energy balances).
				(d) IPCC default values at the upper or lower limit – whatever is more conservative – of the uncertainty at a 95% confidence interval.
					For (a) and (b): Measurements should be undertaken in line with national or international fuel standards.
					For a): If the fuel supplier does provide the NCV value and the CO2 emission factor on the invoice and these two values are based on measurements for this specific fuel, this CO2 factor should be used. If another source for the CO2 emission factor is used or no CO2 emission factor is provided, options (b), (c) or (d) should be used.
						For a) and b): The CO2 emission factor should be obtained for each fuel delivery, from which weighted average values for the period t should be calculated.
						For (c): Review appropriateness of the values annually.
						For (d): Any future revision of the IPCC Guidelines should be taken into account.
								If there is no separate monitoring of electricity consumed from different sources k, the source with the lowest CO2 emission factor shall be used.

3.	$TDL_{AVG-k,y}$	%	Average technical transmission and distribution losses for consuming electricity from source k in year y	1. Use annual average value based on the most recent data available within the country; 2. Use as default values of 20% for: (a) project or leakage electricity consumption sources; (b) baseline electricity consumption sources; 3. Use as default values of 3% for: (a) baseline electricity consumption sources; (b) project and leakage electricity consumption sources.	It should be estimated for the distribution and transmission networks of the electricity grid of the same voltage as the connection where the proposed CDM project activity is connected to. The technical distribution losses should not contain other types of grid losses (e.g. commercial losses/theft). The distribution losses can either be calculated by the project participants or be based on references from utilities,	Annually. In the absence of data from the relevant year, most recent figures should be used, but not older than 5 years.		

№	Data / Parameter	Data unit	Description	Source of data	Measurement procedures	Monitoring frequency	QA/QC procedures	Any comment
					network operators or other official documentation.			

4.	$EF_{CO2,f,BL}$ / $EF_{CO2,AVG-f,y}$	tCO2/GJ	$EF_{CO2,f,BL}$: Average CO_2 emission factor of the different fuel types *f* that are consumed by the baseline building (premises) *j*.
			$EF_{CO2,f,y}$: Average CO_2 emission factor of the different fuel types *f* that are consumed by the building (premises) *j* in year *y*
				(a) Values provided by the fuel supplier in invoices
				This is the preferred source.
				(b) Measurements by the project participants
				(c) Regional or national default values
				These sources can only be used for liquid fuels and should be based on well documented, reliable sources (such as national energy balances).
				(d) IPCC default values at the upper or lower limit – whatever is more conservative – of the uncertainty at a 95% confidence interval.
					For (a) and (b): Measurements should be undertaken in line with national or international fuel standards.	For (a) and (b): The CO2 emission factor should be obtained for each fuel delivery, from which weighted average annual values should be calculated.
						For (c): Review appropriateness of the values annually.
						For (d): Any future revision of the IPCC Guidelines should be taken into account.		

5.	$FC_{f,j,y}$	Mass or volume units	Quantity of fossil fuel type f consumed by the building (premises) j in year y	Onsite measurements.	- Use either mass or volume meters. In cases where fuel is supplied from small daily tanks, rulers can be used to determine mass or volume of the fuel consumed, with the following conditions: The ruler gauge must be part of the daily tank and calibrated at least once a year and have a book of control for recording the measurements (on a daily basis or per shift); - Accessories such as transducers, sonar and piezoelectronic devices are accepted if they are properly calibrated with the ruler gauge and receiving a reasonable maintenance; - In case of daily tanks with pre-heaters for heavy oil, the calibration will be made with the system at typical operational conditions.	Continuously The consistency of metered fuel consumption quantities should be cross-checked by an annual energy balance that is based on purchased quantities and stock changes.		
6.	$NCV_{f,y}$	GJ/mass or volume unit	Net calorific value of the fuel type f in year y	(a) Values provided by the fuel supplier in invoices This is the preferred source. (b) Measurements by the project participants (c) Regional or national default values These sources can only be used for liquid fuels and should be based on	For (a) and (b): Measurements should be undertaken in line with national or international fuel standards.	For (a) and (b): The NCV should be obtained for each fuel delivery, from which weighted average annual values should be calculated.		

№	Data / Parameter	Data unit	Description	Source of data	Measurement procedures	Monitoring frequency	QA/QC procedures	Any comment
				well documented, reliable sources (such as national energy balances). (d) IPCC default values at the upper or lower limit – whatever is more conservative – of the uncertainty at a 95% confidence interval.		For (c): Review appropriateness of the values annually. For (d): Any future revision of the IPCC Guidelines should be taken into account.		
7.	$Occupancy_{j,BL}$	Persons	Average yearly occupancy of the residential baseline building (premises)	Building (premises) owner.	(i) Directly answer (ii) Determined based on baseline surveys	N/A. This parameter will be determined once and will remain fixed through the project lifetime.		The following requirements apply when baseline surveys are used to determine this parameter: - Default number of occupants can be determined for buildings with different ranges of GFA; - The survey shall be conducted following the sampling standard
8.	$Occupancy_{j,y}$	Persons	Average yearly occupancy of the residential baseline building (premises)	Building (premises) owner.	(i) Directly answer (ii) Determined based on baseline surveys	At least once every two years (biennially).		The following requirements apply when baseline surveys are used to determine this parameter: - Default number of occupants can be determined for buildings with different ranges of GFA; - The survey shall be conducted following the sampling standard
9.	$h_{OP,y}$	Hours	Average yearly operating hours of the institutional building (premises) j	Building (premises) owner/building (premises) user.	Directly answer	Yearly.		
10.	CDD_y, CDD_{BL}	Degree-days	CDD_y: Cooling Degrees Days of the region where the building (premises) *j* is located during year *y*. CDD_{BL}: Cooling Degrees Days of the region where the baseline building (premises) is located during year *y*.	Building (premises) owner.		CDD_y: Yearly. CDD_{BL}: Not monitored, the parameter will remain fixed through the project lifetime.		The base temperature used to determine CDD_y and CDD_{BL} shall be the same and shall be documented in the PDD.
11.	HDD_y, HDD_{BL}	Degree-days	HDD_y: Heating Degrees Days of the region where the building (premises) *j* is located during year *y*. HDD_{BL}: Heating Degrees Days of the region where the baseline building (premises) is located during year *y*			HDD_y: Yearly. HDD_{BL}: Not monitored, the parameter will remain fixed through the project lifetime.		The base temperature used to determine HDD_y and HDD_{BL} shall be the same and shall be documented in the PDD.

№	Data / Parameter	Data unit	Description	Source of data	Measurement procedures	Monitoring frequency	QA/QC procedures	Any comment
12.	$GFA_{j,i,y}$	m^2	Gross floor area of the project building (premises) j in building (premises) category i in year y	1. Building plan (Preferred source) 2. On-site measurement (If the building plan is not available)		The parameter shall be determined before the start of the building's construction.	When determined through the building plan, confirm on-site that building geometry represented in the plan is accurate.	When determined using sampling, the requirements of the latest version of the Sampling standard shall be followed. This parameter shall be monitored only when emission reductions are determined through the application of a conservative baseline that standardizes the specific CO2 emissions of buildings.
13.	$EC_{j,i,y}$	MWh/yr	Electricity consumed by the project building (premises) j in building (premises) category i in year y (MWh)	Direct measurement or calculated based on measurements from more than one electricity meters.	Use electricity meters installed at the electricity consumption sources.	Continuous measurement and at least monthly recording.		When determined using sampling, the requirements of the latest version of the Sampling standard shall be followed. Values shall be cross-checked against electricity purchase receipts/invoices.
14.	$EF_{elec,y}$	tCO2e/MWh	Emission factor of the electric grid supplying electricity to the project building (premises) j in building (premises) category i	The Order of the Ministry of Natural Resources and Ecology of the Russian Federation (29.06.2017 № 330) "On approval of guidelines for quantifying the volume of indirect energy emissions of greenhouse gases"				
15.	TDL_y	%	Average technical transmission and distribution losses for providing electricity to the grid to which the project building (premises) j in building (premises) category i is connected	1. Use annual average value based on the most recent data available within the country; 2. Use as default values of 20% for: (a) project or leakage electricity consumption sources; (b) baseline electricity consumption sources; 3. Use as default values of 3% for: (a) baseline electricity consumption sources; (b) project and leakage electricity consumption sources.		Annually. In the absence of data from the relevant year, most recent figures should be used, but not older than 5 years.		
16.	$FC_{k,j,i,y}$	Mass or volume units	Fossil fuel type k consumed by the project building (premises) j in building (premises) category i in year y (mass or volume units)	Onsite measurements.	- Use either mass or volume meters. In cases where fuel is supplied from small daily tanks, rulers can be used to determine mass or volume of the fuel consumed, with the following conditions: The ruler gauge must be part of the daily tank and calibrated at least once a year and have a book of control for recording the measurements (on a daily basis or per shift); - Accessories such as transducers, sonar and piezoelectronic devices	Continuously The consistency of metered fuel consumption quantities should be cross-checked by an annual energy balance that is based on purchased quantities and stock changes.	Values shall be cross-checked against fuel purchase receipts/invoices.	This parameter shall be monitored only when emission reductions are determined through the application of a conservative baseline that standardizes the specific CO2 emissions of buildings.

№	Data / Parameter	Data unit	Description	Source of data	Measurement procedures	Monitoring frequency	QA/QC procedures	Any comment
					are accepted if they are properly calibrated with the ruler gauge and receiving a reasonable maintenance; - In case of daily tanks with pre-heaters for heavy oil, the calibration will be made with the system at typical operational conditions.			

17.	NCV_k	GJ/mass or volume units	Net calorific value of the fossil fuel type k	(a) Values provided by the fuel supplier in invoices
				This is the preferred source.
				(b) Measurements by the project participants
				(c) Regional or national default values
				These sources can only be used for liquid fuels and should be based on well documented, reliable sources (such as national energy balances).
				(d) IPCC default values at the upper or lower limit – whatever is more conservative – of the uncertainty at a 95% confidence interval.
					For (a) and (b): Measurements should be undertaken in line with national or international fuel standards.	For (a) and (b): The NCV should be obtained for each fuel delivery, from which weighted average annual values should be calculated.
						For (c): Review appropriateness of the values annually.
						For (d): Any future revision of the IPCC Guidelines should be taken into account.		

18.	$EF_{CO2,k}$	tCO2/GJ	$EF_{CO2,k}$: CO_2 emission factor of the fossil fuel type k	(a) Values provided by the fuel supplier in invoices
				This is the preferred source.
				(b) Measurements by the project participants
				(c) Regional or national default values
				These sources can only be used for liquid fuels and should be based on well documented, reliable sources (such as national energy balances).
				(d) IPCC default values at the upper or lower limit – whatever is more conservative – of the uncertainty at a 95% confidence interval.
					For (a) and (b): Measurements should be undertaken in line with national or international fuel standards.	For (a) and (b): The CO2 emission factor should be obtained for each fuel delivery, from which weighted average annual values should be calculated.
						For (c): Review appropriateness of the values annually.
						For (d): Any future revision of the IPCC Guidelines should be taken into account.		

19.	$Occ_{j,i,y}$	Person	Average number of occupants of the project building (premises) j in building (premises) category i in year y	Survey with project buildings.		Yearly, based on survey.		When determined using sampling, the requirements of the latest version of the Sampling standard shall be followed. This parameter shall be monitored only when emission reductions are determined through the application of a conservative baseline that standardizes the specific CO2 emissions of buildings.

№	Data / Parameter	Data unit	Description	Source of data	Measurement procedures	Monitoring frequency	QA/QC procedures	Any comment
20.	$EC_{grid,j,i,BL}$ / $EC_{captive,j,i,BL}$ / $EC_{WP,s,BL}$	MWh/year	$EC_{grid,j,i,BL}$: Grid electricity consumption by the baseline building (premises) *j* in building (premises) category *i* included in the sample. $EC_{captive,j,i,BL}$: Captive electricity consumption by the baseline building (premises) *j* in building (premises) category *i* included in the sample. $EC_{WP,s,BL}$: Electricity consumed to produce the chilled water system for the baseline building (premises) *j* in building (premises) category *i* in the sample. Take average of the data from the coverage period	Direct measurement or calculated based on measurements from more than one electricity meters	Use electricity meters installed at the grid interface for electricity export to grid and for supply to captive consumers use electricity meters installed at the entrance of the electricity consuming facility. In case of grid and net electricity generation: This parameter should be either monitored using bi-directional energy meter or calculated as difference between (a) the quantity of electricity supplied by the project plant/unit to the grid; and (b) the quantity of electricity the project plant/unit from the grid. If it is calculated, then the following parameters shall be measured: (a) The quantity of electricity supplied by the project plant/unit to the grid; and (b) The quantity of electricity delivered to the project plant/unit from the grid	Continuous measurement and at least monthly recording	The electricity meter will be subject to regular maintenance and testing in accordance with the stipulation of the meter supplier and/or as per the requirements set by the grid operators or national requirements. The calibration of meters, including the frequency of calibration, accuracy class should be done in accordance with national standards or requirements set by the meter supplier or requirements set by the grid operators. If these standards are not available, calibrate the meters every 3 years and use the meters with at least 0.5 accuracy class. The electricity generation shall be cross-checked with records of electricity sale.	If the electricity consumed is measured for the whole building and not individually for each building (premises), this parameter shall be determined by multiplying the electricity consumed by the whole building by the ratio between the GFA of the building (premises) *i* and the GFA of the total building, as follows: $EC_{grid,j,i,BL}= EC_{Bldg,BL}\times GFA_{j,i}GFA_{Bldg}$, where If the electricity is supplied by a captive power plant, $EC_{grid,j,i,}BL$ is replaced by $EC_{captive,j,i,BL}$; $EC_{Bldg,BL}$ = electricity consumed by the whole building, which baseline building (premises) *j* in building (premises) category *i* belongs to over the applicable data coverage period (MWh/year); GFA_{Bldg} = gross floor area of the whole building which baseline building (premises) *j* in building (premises) category *i* belongs to (m^2)
21.	$m_{j,i,BL}$ / $m_{s,BL}$	kg/year	$m_{j,i,BL}$: mass of chilled water consumption of baseline building (premises) *j* in building (premises) category *i* included in the sample over the applicable data coverage period (kg/year). $m_{s,BL}$: mass of chilled water production by chilled water system *s* over the applicable data coverage period (kg/year). Take average of the data from the coverage period	(a) Utility billing records or (b) On-site measurements.	(a) As per the utility metering; (b) Use mass meters.	(a) As per the utility metering; (b) Continuously, aggregated at least annually.	Check consistency of the monitored records with the records from previous monitoring intervals.	
22.	$\Delta t_{j,i,BL}$ / $\Delta t_{s,BL}$	K or Celsius	$\Delta t_{j,i,BL}$: Average temperature difference between the outlet and inlet of the heat exchanger used for the cooling/heating of building (premises) *j* in building (premises) category *i* included in the sample over	(a) Readings taken from temperature meters installed at pipeline of inlet and outlet of the heat exchanger used for the chilled water supply. This is the preferred source. (b) Specification of the manufacturer of the chilled water system.				The temperature meter readings should be installed at the immediate inlet and outlet point of the heat exchanger of the chilled water system.

№	Data / Parameter	Data unit	Description	Source of data	Measurement procedures	Monitoring frequency	QA/QC procedures	Any comment
			the applicable data coverage period. $\Delta t_{s,BL}$: Average temperature difference between the outlet and inlet of the heat exchanger used for the chilled water production in chilled water system *s* over the applicable data coverage period					
23.	vj,i,BL	m^3/year	Annual average chilled water consumption (in volume) of baseline building (premises) *j* in building (premises) category *i* included in the sample over the applicable data coverage period (m^3/year). Take average of the data from the coverage period	On-site measurements.	Use volume flow-meters			Applicable only if a volume flow meter is installed for monitoring of chilled water production.
24.	$\eta_{dist,s,BL}$	decimal	Average technical distribution losses of the chilled water system network serving baseline building (premises) *j* in building (premises) category *i* included in the sample over the applicable data coverage period i.e. GJ of technical thermal energy losses in the chilled water distribution network divided by GJ of thermal energy supplied to the buildings (premises). Take average of the data from the coverage period	Monitoring records of thermal energy supply and demand or thermal energy loss measurement. A default value of 0 per cent may be used if no recent data are available or the data cannot be regarded accurate and reliable.	(a) Based on monitoring of thermal energy supply and demand; or (b) Measurement and estimation of surface thermal energy losses. Follow authentic engineering handbooks/ publications or national or international standards for calculation of the surface thermal energy losses.			

Appendix 5. Risk management

Table A5.1. Risk management

Stage of climate project implementation	**Description of risk**	**Probability of occurrence**	**Impact on the project**	**Impact period**	**Risk minimization methods**	**Implementation period**
		1. low 2. medium 3. high	1. low 2. medium 3. high	1. preparation period 2. 1-2 years after the implementation 3. the entire period of the climate project	Detailed description of mitigation measures for each risk	Description of the time frame for the implementation of these activities
		Scale from 1 to 5 or others	Scale from 1 to 5 or others			

Appendix 6. Recommended approach for calculation of grid emissions factor (emission factor for an electricity system)

1. Currently, there are no legislatively approved grid emission factors for greenhouse gases (GHG) in the Russian Federation.

2. If the initial data required to calculate the grid emission factor for the baseline and project scenarios is available, the climate project developer has the right to calculate it independently. In this case, it is recommended to use the Guidelines for the quantitative calculation of the volume of indirect energy emissions of greenhouse gases (Order of the Ministry of Natural Resources № 330 (29.06.2017)[50]) and the principles for calculating indirect energy emissions defined in GOST R ISO 14064-1-2021[51].

   To determine the grid emission factor, a regional method for calculation of indirect energy emissions is used, which reflects the average intensity of greenhouse gas emissions at facilities generating electrical and thermal energy consumed by the organization (Order of the Ministry of Natural Resources № 330).

   According to GOST R ISO 14064-1-2021 (Appendix E), emissions from imported electricity must be calculated by the project developer using a location-based approach[52] by applying an emission factor that best characterizes the relevant electric power system, i.e. leased transmission line, local, regional or national grid average emission factor. The grid-averaged emission factors should refer to the emissions of the reporting year, if available, or otherwise the latest available year. Grid-averaged emission factors for imported electricity should be based on the average consumption pattern from the electric power system from which the electricity is consumed.

   Grid emission factors may also include other indirect emissions associated with electricity generation, such as transmission and distribution losses.

   The requirements and guidance described in ISO 14064-1-2021 for electricity also apply to consumed and transferred heat, steam, cooling air and compressed air.

[50] Order of the Ministry of Natural Resources and Ecology of the Russian Federation (29.06.2017 № 330) "On approval of guidelines for quantifying the volume of indirect energy emissions of greenhouse gases"

[51] GOST R ISO 14064-1-2021. National Standard of the Russian Federation. Greenhouse gases. Part 1. Requirements and Guidance for Quantification and Reporting of Greenhouse Gas Emissions and Absorption at the Organization Level (approved and enacted by Rosstandart Order 30.09.2021 №1029-st)

[52] The location-based approach is a method for quantifying indirect energy emissions based on average emission factors from energy production for a given geographic location, including local, regional or national boundaries

In case of energy from cogeneration facilities, it is necessary to use approaches to separate various forms of energy[53].

Association "NP Market Council (Sovet Rynka)" and JSC "ATS" have developed a concept for calculating and publishing greenhouse gas emission factors for the energy system of the Russian Federation[54]. Based on the results of the peer review, independent international auditors issued an assurance certificate, and this concept received a validation report[55]. It is assumed that the implementation of this concept will lead to the more accurate calculation and publication of grid emission factors. The approaches outlined in the concept can also be used by the project developer to calculate the emission factor of the electric power system.

3. If it is impossible to calculate the grid emission factor on its own, the project developer can use grid emission factors from the following sources:

   Source 1. JSC "Administrator of the Trading System" in test mode in 2021 launched an Internet resource that publishes the grid CO2 emission factor for the first synchronous zone of the Russian Federation for various time periods (hour, day, month, year) [56].

   Source 2. Emission factors of the International Energy Agency (IEA). The data is updated annually for the entire energy system of the regions (including the Russian Federation) and reflects the average carbon intensity of electricity and heat generation[57].

   Source 3. Climate Transparency Global Partnership develops G20 climate indicators. The agency publishes annually reports from the G20[58] countries, including the average energy emission factor.

4. Methods and approaches applied to the calculation of the grid emission factor should be documented and specified in the PDD. It is necessary to justify the chosen calculation methodology, disclose information about the source of the initial data used, transparently and accurately document your own procedure for calculating the grid emission factor, or describe the properties of the selected and applied grid emission factor.

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[53] For example, calculation of specific fuel consumption in accordance with the "Guidelines for the distribution of specific fuel consumption in the production of electrical and thermal energy within combined generation of electrical and thermal energy, used for the purpose of tariff regulation in the heat supply", legislatively approved by the Order of the Ministry of Energy of the Russian Federation (12.09.2016 №952)

[54] The concept of calculation and publication of greenhouse gas emission factors for the energy system of the Russian Federation URL: https://www.np-sr.ru/sites/default/files/koncepciya_kev.pdf

[55] As part of the validation procedure, a detailed verification of the Concept was carried out for its compliance with the requirements of the international standards in the field of accounting and reporting on greenhouse gas emissions (TÜV AUSTRIA). Based on the results of the audit, the Concept was recognized by international experts as complying with high international standards and best international practices for calculating energy system emission factors. URL: https://www.np-sr.ru/sites/default/files/zaklyuchenie_o_validacii_koncepcii.pdf

[56] URL: https://www.atsenergo.ru/results/co2

[57] URL: https://www.iea.org/data-and-statistics/data-product/emissions-factors-2021

[58] URL: https://www.climate-transparency.org/g20-climate-performance/g20report2022#1531904804037-423d5c88-a7a7

Appendix 7. Recommended approach for calculation of indirect energy emissions factor for captive use and mini-grid

1. Calculation of the indirect energy emissions factor for captive use and mini-grid electricity consuming is carried out by the market approach (Order of the Ministry of Natural Resources of Russia №330 29.06.2017[59]).

2. The market approach is used when the electricity consumed is received under bilateral contracts for the sale of electricity, signed in accordance with the rules of the wholesale electricity and capacity market and the operation of retail electricity markets[60]. Market factors of indirect energy emissions are indicated in sales contracts, in retail electricity markets contracts; or provided in certificates confirming the volume of electricity production at generating facilities produced from renewable energy sources, information about which is entered in the register[61]; or calculated based on the volumes of electricity received from specific external generating facilities in accordance with the terms of sales contracts, retail market contracts or certificates for the reporting period. Methodological guidelines for the calculation are set out in the Order of the Ministry of Natural Resources of Russia №330 29.06.2017.

3. If the supplier of electricity under sales contracts, retail market contracts or certificates has several generating facilities[62], the market factor is determined only for the generating facility (or generating facilities) from which (or from which) electricity is received by the consumer.

4. If additional electrical energy is consumed under project activity, that was not declared by sales contracts, retail market contracts or certificates (undeclared balance of electricity, i.e. the amount of electricity consumed in excess of the established contract (and) and/or certificate(s)), then the volume of the undeclared balance of electrical energy is determined based on the information of electricity received from external generating facilities located in the regional energy system. Thus, indirect energy emissions from the consumption of electricity received under contracts and/or certificates are calculated based on the market approach, and indirect emissions from the consumption of undeclared balance of electricity - using location-based approach (see Appendix 1).

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[59] Order of the Ministry of Natural Resources and Ecology of the Russian Federation (29.06.2017 № 330) "On approval of guidelines for quantifying the volume of indirect energy emissions of greenhouse gases"

[60] Federal Law "On the Electric Power Industry" with amendments and additions (26.03.2003 №35-FZ)

61 Decree of the Government of the Russian Federation "On some issues related to the certification of volumes of electrical energy produced at generating facilities operating on the use of renewable energy sources" with amendments and additions (№117 17.02.2014)

[62] For example, hydropower stations or thermal power stations

5. In the Russian Federation there are generating facilities that do not connected with the Unified Energy System of Russia - Technologically isolated territorial electric power system (TITEPS[63]). In such cases, calculation of indirect energy emissions should be based on the individual emission factors of all generating facilities included in mini-grid (the Order of the Ministry of Natural Resources of Russia №330 29.06.2017).

6. Market approach is not used to calculate indirect energy emissions from heat consumption. Thermal energy received from external generating facilities is evaluated by the location-based approach (the Order of the Ministry of Natural Resources of Russia №330 29.06.2017).

7. The project developer needs to ensure that the used approaches and data comply with the general requirements and guidance for considering imported electricity consumed for project activity set out in GOST R ISO 14064-1-2021[64] (Appendix E).

8. Used input data sources, applied methods and approaches should be documented and specified in the PDD. It is necessary to justify the chosen calculation methodology, disclose information about the source of the initial data used, transparently and accurately document procedure for calculating indirect energy emission factor based on market approach.

[63] Technologically isolated territorial electric power system (TITEPS) - an electric power system located on the territory determined by the Government of the Russian Federation, which has no technological connection with the Unified Energy System of Russia (GOST R 57114-2016 Unified energy system and isolated operating energy systems. Electric power systems. Operational and dispatching management in the electric power industry and operational-technological management. Terms and definitions.)

[64] GOST R ISO 14064-1-2021. National Standard of the Russian Federation. Greenhouse gases. Part 1. Requirements and Guidance for Quantification and Reporting of Greenhouse Gas Emissions and Absorption at the Organization Level (approved and enacted by Rosstandart Order 30.09.2021 №1029-st)