



**AIR QUALITY CONTROL ADVISORY COUNCIL
AGENDA
March 12, 2018**

Maryland Department of the Environment
Aeris Conference Room (1st Floor MDE Lobby)
1800 Washington Boulevard
Baltimore MD 21230

<https://global.gotomeeting.com/join/480449061>

United States: +1 (571) 317-3117

Access Code: 480-449-061

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|-----------|-----------------------------|---|
| 8:15 a.m. | Welcome and Introductions | John Quinn, Advisory Council Chair
Tad Aburn, Air Director |
| 8:25 a.m. | Approval of Meeting Minutes | John Quinn |

Action Items for Discussion/Approval:

- | | | |
|-----------|--|-----------------|
| 8:30 a.m. | Maryland CO2 Budget Trading Program
COMAR 26.09.01, 26.09.02, 26.09.03 and 26.09.04 | Luke Wisniewski |
|-----------|--|-----------------|

Briefings:

- | | | |
|------------|--------------------------------|-----------|
| 10:30 a.m. | 2017 Path Forward presentation | Tad Aburn |
| 11:30 a.m. | Adjourn | |

Next Meeting Dates:

June 11, 2018
September 17, 2018
December 10, 2018

Purpose of These Amendments

The purpose of this action is to revise the Maryland CO₂ Budget Trading Program to incorporate amendments to the Regional Greenhouse Gas Initiative (RGGI) Model Rule.

Submission to EPA as Revision to Maryland's SIP

This action will not be submitted to the U.S. Environmental Protection Agency (EPA) for approval as part of Maryland's State Implementation Plan (SIP).

Background

RGGI is composed of individual CO₂ Budget Trading Programs in each RGGI participating state. Each participating state's CO₂ Budget Trading Program is based on the RGGI Updated Model Rule (2013), which was developed to provide guidance to states as they implemented the RGGI program. RGGI participating states have conducted a Program Review, which is a comprehensive evaluation of program successes, program impacts, the potential for additional reductions, imports and emissions leakage, and offsets.

Amendments to the RGGI Model Rule were developed by the RGGI state staff as part of the Program Review, and a consensus agreement was reached in 2017. This effort was supported by an extensive regional stakeholder process that engaged the regulated community, environmental non-profits, and other organizations with technical expertise in the design of cap-and-invest programs.

Maryland's CO₂ Budget Trading Program is being amended to incorporate changes to the RGGI Model Rule. A summary of the amendments to the RGGI Program, as outlined in the RGGI Model Rule, are discussed below.

Size and Structure of Regional Cap and Allowance Apportionment

The regional emissions cap in 2021 will be equal to 75,147,784 tons and will decline by 2.275 million tons of CO₂ per year thereafter, resulting in a total 30 percent reduction in the regional cap from 2020 to 2030. Maryland's base budget allocation (COMAR 26.09.02.03A) has been updated to reflect the new RGGI cap and decline.

Budget Adjustments

The RGGI Model Rule contains language to address the private bank of allowances through one additional, distinct budget adjustment. The Third Adjustment for Banked Allowances (COMAR 26.09.02.03H), would adjust the base budget for 100 percent of the pre-2021 vintage allowances held by market participants as of the end of 2020, that are in excess of the total quantity of 2018, 2019, and 2020 emissions. The third adjustment timing and algorithm is spelled out in the RGGI Model Rule and would be implemented over the 5-year period, 2021-2025, after the actual size of the 2020 vintage private bank is determined.

Cost Containment Reserve

The RGGI Model Rule contains language for the continued use of a cost containment reserve (CCR)

(COMAR 26.09.02.03C) that will provide flexibility and cost containment for the program. The CCR would consist of a fixed quantity of allowances, in addition to the cap, that would be held in reserve, and only made available for sale if allowance prices exceed predefined price levels. The annual CCR allowance quantity would be 10 percent of the regional cap beginning in 2021 and each succeeding year thereafter. The CCR allowances would be made available immediately in any auction in which demand for allowances at prices above the CCR trigger price (COMAR 26.09.01.02B(34-1)) exceeds the supply of allowances offered for sale in that auction prior to the addition of any CCR allowances. If the CCR is triggered, the CCR allowances would only be sold at or above the CCR trigger price, which will be \$13.00 in 2021 and rise at 7 percent per year, so that the CCR would only trigger if emission reduction costs are higher than projected.

Emissions Containment Reserve

The RGGI Model Rule contains language for the creation and use of an emissions containment reserve (ECR) (COMAR 26.09.02.03D) that will respond to supply and demand in the market if emission reduction costs are lower than projected. States will withhold allowances from circulation to secure additional emissions reductions if prices fall below established trigger prices. Allowances withheld in this way will not be reoffered for sale.

The annual ECR allowance withholding limit would be 10 percent of the budgets of states implementing the ECR. The ECR trigger price (COMAR 26.09.01.02B(34-3)) will be \$6.00 in 2021, and rise at 7 percent per year, so that the ECR will only trigger if emission reduction costs are lower than projected.

Offsets

The RGGI Model Rule contains language that eliminates two offset categories: Reduction in Emissions of Sulfur Hexafluoride (SF₆) (COMAR 26.09.03.04) due to obsolescence, and Reduction in Avoidance of CO₂ Emissions from Natural Gas, Oil, or Propane End-Use Combustion Due to End-Use Energy Efficiency (COMAR 26.09.03.06) due to improvements and availability of energy efficiency technologies. The remaining offset categories were updated and retained and any awarded offset allowances would remain fully fungible across the states.

Miscellaneous

The RGGI Model Rule retains language to increase the minimum reserve price (COMAR 26.09.01.02B(72-2)) by 2.5 percent each year.

Sources Affected and Location

CO₂ budget sources subject to the requirements of the Maryland CO₂ Budget Trading Program will be affected.

Requirements

Compliance requirements for CO₂ budget sources subject to the Maryland CO₂ Budget Trading Program will remain the same.

Expected Emissions Reductions

The changes to the size and structure of the regional cap and allowance apportionments will result in emissions reductions. The regional emissions cap in 2021 will be equal to 75,147,784 tons and will decline by 2.275 million tons of CO₂ per year thereafter, resulting in a total 30 percent reduction in the regional cap from 2020 to 2030.

Economic Impact on Affected Sources, the Department, other State Agencies, Local Government, other Industries or Trade Groups, the Public

The participating RGGI states conducted economic analysis utilizing the REMI model to determine the overall impact on the RGGI region from these changes. The analyses showed that the estimated economic impact across the RGGI region is an increase in gross state product of \$2.79 billion from 2017 to 2031, and \$9.5 billion from 2017 to 2046; and an increase in employment of 34,397 job-years from 2017 to 2031, and 130,119 job-years from 2017 to 2046.

Economic Impact on Small Businesses

The participating RGGI states conducted economic analysis utilizing the REMI model and Bill Impact analyses to determine the effect on electricity prices. These changes will have minimal effect on electricity prices.

Comparison to Federal Standards

There is no corresponding federal standard to this proposed action.

Questions

Please contact Luke Wisniewski, Climate Change Division Chief, at 410-537-4231 or luke.wisniewski@maryland.gov with any questions.

Title 26 DEPARTMENT OF THE ENVIRONMENT

Subtitle 09 MARYLAND CO₂ BUDGET TRADING PROGRAM

Chapter 01 General Administrative Provisions

Authority: Environment Article, §§1-101, 1-404, 2-103, and 2-1002(g), Annotated Code of Maryland

.01 (text unchanged).

.02 Definitions.

A. (text unchanged)

B. Terms Defined.

(1) — (4) (text unchanged)

(4-1) "Alternate CO₂ authorized account representative" means:

(a) For a CO₂ budget source, the alternate individual who is authorized by the owners and operators of the source to represent and legally bind them in matters pertaining to this subtitle; or

(b) For a general account, the alternate individual who is authorized to transfer or otherwise dispose of CO₂ allowances held in the general account.

(4-2) "Anaerobic digester" means a device that promotes the decomposition of organic material to simple organics and gaseous biogas produces, in the absence of elemental oxygen, usually accomplished by means of controlling temperature and volume, and including a methane recovery system.

(5) "Anaerobic digestion" means the [degradation] decomposition of organic material, including manure, brought about through the action of microorganisms in the absence of elemental oxygen.

(6) — (8) (text unchanged)

[(9) "ASHRAE" means the American Society of Heating, Refrigerating and Air-Conditioning Engineers.]

[(10)] (9) — [(17)] (16) (text unchanged)

[(18) "Building envelope" means the elements that separate conditioned space from unconditioned space, or that enclose semi-heated space through which thermal energy may be transferred to or from the exterior including walls, windows, foundation, basement slab, ceiling, roof, and insulation.]

[(18-1)] (17) — [(18-2)] (18) (text unchanged)

[(18-3)] (18-1) Climate Action Plan.

(a) "Climate action plan" means a written plan submitted to the Department by a CO₂ budget source that identifies and analyzes its [CO₂] CO₂e emission reduction or sequestration strategies and plans.

(b) "Climate action plan" includes, but is not limited to, the following components:

(i) Baseline data and forecasts for on-site [CO₂] CO₂e emissions;

(ii) Short and long term goals for reducing or sequestering [CO₂] CO₂e emissions;

(iii) Identification of [CO₂] CO₂e emission reduction or sequestration techniques and strategies that the CO₂ budget source will implement and the timetable for implementation; and

(iv) An estimate of the [CO₂] CO₂e emissions reductions that will result from the implementation of the emission reduction or sequestration techniques and strategies identified pursuant to [§B(18-3)(b)(iii)] §B(18-1)(b)(iii) of this regulation.

(19) — (25) (text unchanged)

(26) "CO₂ allowance tracking system, or COATS" means the system that records allocations, deductions, and transfers of CO₂ allowances which may also be used to track CO₂ emissions offset projects, CO₂ allowance prices, and emissions from affected sources.

(27) — (34) (text unchanged)

(34-1) "CO₂ cost containment reserve trigger price, or CCR trigger price" means the minimum price at which CO₂ CCR allowances are offered for sale by the Department at an auction, and shall be:

(a) \$10.00 per CO₂ allowance for calendar year 2017;

(b) Each calendar year thereafter through 2020, the CCR trigger price shall be 1.025 multiplied by the CCR trigger price from the previous calendar year, rounded to the nearest whole cent as follows:

(i) \$10.25 for 2018;

(ii) \$10.51 for 2019; and

(iii) \$10.77 for 2020.

(c) \$13.00 per CO₂ allowance for calendar year 2021; and

(d) Each calendar year thereafter, the CCR trigger price shall be 1.07 multiplied by the CCR trigger price from the previous calendar year, rounded to the nearest whole cent as follows:

(i) \$13.91 for 2022;

- (ii) \$14.88 for 2023;
- (iii) \$15.93 for 2024;
- (iv) \$17.04 for 2025;
- (v) \$18.23 for 2026;
- (vi) \$19.51 for 2027;
- (vii) \$20.88 for 2028;
- (viii) \$22.34 for 2029; and
- (ix) \$23.90 for 2030.

(34-2) “CO₂ emissions containment reserve allowance, or CO₂ ECR allowance” means a CO₂ allowance that is withheld from sale at an auction by the Department for the purpose of additional emission reduction in the event of lower than anticipated emission reduction costs.

(34-3) “CO₂ emissions containment reserve trigger price, or ECR trigger price” means the price below which CO₂ allowances will be withheld from sale by the Department or its agent at an auction. The ECR trigger price shall be:

(a) \$6.00 for calendar year 2021; and

(b) For each calendar year thereafter, the ECR trigger price shall be 1.07 multiplied by the ECR trigger price from the previous calendar year, rounded to the nearest whole cent as follows:

- (i) \$6.42 for 2022;
- (ii) \$6.87 for 2023;
- (iii) \$7.35 for 2024;
- (iv) \$7.86 for 2025;
- (v) \$8.42 for 2026;
- (vi) \$9.00 for 2027;
- (vii) \$9.63 for 2028;
- (viii) \$10.31 for 2029; and
- (ix) \$11.03 for 2030.

[(34-1)] (34-4) (text unchanged)

(35) — (37) (text unchanged)

(37-1) “Combined heat and power unit, CHP unit, or cogeneration unit” means an electric generating unit that uses a steam-generating unit or stationary combustion turbine to simultaneously produce both electric (or mechanical) and useful thermal output from the same primary energy facility.

(38) — (40) (text unchanged)

[(41)] “Commercial building” means a structure, excluding a low-rise residential building, to which the provisions of ANSI/ASHRAE/IESNA Standard 90.1-2007 apply.]

[(42)] (41) (text unchanged)

(42) “Conflict of interest” means a situation that may arise with respect to an individual in relation to any specific project sponsor, CO₂ emissions offset project or category of offset projects, such that the individual’s other activities or relationships with other persons or organizations render or may render the individual incapable of providing an impartial certification opinion, or otherwise compromise the individual’s objectivity in performing certain functions.

[(43)] “Condensing mode” means the design and operation of fuel-burning equipment in a mode that leads to the production of condensate in flue gases.]

[(44)] (43) — [(45)] (44) (text unchanged)

(45) “Cooperating regulatory agency” means a regulatory agency in a state or other United States jurisdiction that is not a participating state that has entered into a memorandum of understanding with the appropriate regulatory agencies of all participating states to carry out certain obligations relative to CO₂ emissions offset projects in that state or United States jurisdiction, including but not limited to the obligation to perform audits of offset project sites, and report violations of this subtitle.

[(45-1)] “Cost containment reserve trigger price, or CCR trigger price” means the minimum price at which CO₂ CCR allowances are offered for sale by the Department at an auction, and shall be:

- (a) \$4.00 per CO₂ allowance for calendar year 2014;
- (b) \$6.00 per CO₂ allowance for calendar year 2015;
- (c) \$8.00 per CO₂ allowance for calendar year 2016;
- (d) \$10.00 per CO₂ allowance for calendar year 2017; and
- (e) Each calendar year thereafter, the CCR trigger price shall be 1.025 multiplied by the CCR trigger price from the previous

calendar year, rounded to the nearest whole cent.]

(46) — (49) (text unchanged)

(49-1) “Current vintage year” means a CO₂ allowance that was originated in the current calendar year.

(50) — (52) (text unchanged)

(52-1) “Emission containment reserve account” means a general account established by the Department for the purpose of withholding CO₂ allowances from sale at an auction by the Department for the purpose of additional emission reduction in the event of lower than anticipated emission reduction costs.

[(53)] “Energy conservation or efficiency measure” means a set of activities designed to increase the energy efficiency of a building or improve the management of energy demand, involving the following:

(a) Physical changes to facility equipment;
(b) Modifications to a building; or
(c) Revisions to operating and maintenance procedures, software changes, or new means of training or managing users of the building or operations and maintenance staff.

(54) "Energy performance" means a measure of the relative energy efficiency of a building, building equipment, or building components, as measured by the amount of energy required to provide building services.

(55) "Energy services" means provision of useful services to building occupants such as heating and hot water, cooling, and lighting.]

[(56)] (53) — [(56-1)] (54) (text unchanged)

[(57)] (55) "First control period [interim] adjustment for banked allowances" means, for allocation years 2014 through 2020, an adjustment, applied to the Maryland CO₂ Budget Trading Program base budget, to address the surplus allowances from allocation years 2009, 2010, and 2011 held in general and compliance accounts, including compliance accounts established pursuant to the CO₂ Budget Trading Program, that are in addition to the aggregate quantity of first control period CO₂ emissions from all CO₂ budget sources in all of the participating states. Allowances in accounts opened by participating states are not included.

[(58)] (56) (text unchanged)

[(58-1)] (57) "Forest offset project data report" means the report prepared by a project sponsor each year that provides the information and documentation required by COMAR [26.09.03.05] 26.09.03.04 or the forest offset protocol.

[(58-2)] (58) "Forest offset protocol" means the protocol titled "Regional Greenhouse Gas Initiative Offset Protocol U.S. Forest Projects, June 13, 2013"[, published by the participating states on http://www.rggi.org/docs/ProgramReview/_FinalProgramReviewMaterials/Forest_Protocol_FINAL.pdf].

(59) Fossil Fuel-Fired.

(a) (text unchanged)

(b) "Fossil fuel-fired" means, for a unit that commenced *or commences* operation on or after January 1, 2005, the combustion of fossil fuel alone or in combination with any other fuel, where the fossil fuel combusted comprises, or is projected to comprise, more than 5 percent of the annual heat input on a Btu basis during any year.

(60) (text unchanged)

[(61)] "Furnace" means a self-contained, indirect-fired appliance that:

(a) Supplies heated air to a residential building or commercial building through ducts to conditioned spaces; and

(b) Has a heat input rate of less than 225,000 Btu per hour.]

[(61-1)] (61) — [(61-2)] (61-1) (text unchanged)

(62) (text unchanged)

(63) "Global warming potential (GWP)" means a numerical measure of the radiative efficiency or heat-absorbing ability of a particular gas, relative to that of CO₂, after taking into account the decay rate of each gas, relative to that of CO₂, and consistent with the values used in the Intergovernmental Panel on Climate Change, [IPCC Third] *Fifth Assessment Report, Climate Change [2001] 2013: The Physical [Scientific] Science Basis*, Chapter [6] 8 "Anthropogenic and Natural Radiative Forcing", Section [12] 8.7 ["Global Warming Potentials"] "Emission Metrics" (pages 710-720).

(64) (text unchanged)

[(65)] "HVAC system" means the system or systems that provide, either collectively or individually, heating, ventilation, or air conditioning to a building, including the equipment, distribution network, and terminals.

(66) "IESNA" means the Illuminating Engineering Society of North America.]

[(67)] (65) — [(67-2)] (67) (text unchanged)

(68) "Life-of-the-unit contractual arrangement" means a unit participation power sales agreement under which a customer reserves, or is entitled to receive, a specified amount or percentage of nameplate capacity or associated energy from any specified unit pursuant to a contract:

(a) (text unchanged)

(b) For a cumulative term of not less than [25] 30 years, including contracts that permit an election for early termination; or

(c) For a period equal to or greater than [20] 25 years or 70 percent of the economic useful life of the unit determined as of the time the unit is built, with option rights to purchase or release some portion of the nameplate capacity and associated energy generated by the unit at the end of the period.

(68-1) — (71) (text unchanged)

(72) "Maryland CO₂ Budget Trading Program adjusted budget" means the number of CO₂ allowances available for allocation and auction annually, determined in accordance with COMAR [26.09.02.03G] 26.09.02.03I and the CO₂ Budget Trading Program. CO₂ allowances allocated under the Maryland CO₂ Budget Trading Program adjusted budget are separate from:

(a) — (b) (text unchanged)

(72-1) — (73) (text unchanged)

(74) ["Noncensus water" means streams, sloughs, estuaries, and canals more than 120 feet long and less than 1/8 of a mile wide, including lakes, reservoirs, and ponds that are 1—40 acres in size.] *Net-Electric Output*.

(a) "Net-electric output" means the amount of gross generation the generator(s) produce, as measured at the generator terminals, less the electricity used to operate the plant (i.e., auxiliary loads), including but not limited to the following:

(i) Output from steam turbine(s);

(ii) Combustion turbine(s);

(iii) *Gas expander(s); and*

(iv) *Other generator types deemed fit by the Department.*

(b) *Such uses include fuel handling equipment, pumps, fans, pollution control equipment, other electricity needs, and transformer losses as measured at the transmission side of the step up transformer (e.g., the point of sale).*

(75) — (75-1) (text unchanged)

(75-2) *“Off-site” means a location that is not contiguous with the property where the anaerobic digester is located.*

(76) — (78) (text unchanged)

[(79) "Passive solar" means a combination of building design features and building components that utilize solar energy to reduce or eliminate the need for mechanical heating and cooling and daytime artificial lighting.]

[(80)] (79) — [(88)] (87) (text unchanged)

[(89) Residential Building.

(a) "Residential building" means a low-rise residential building to which the provisions of ANSI/ASHRAE/IESNA Standard 90.1-2007 do not apply.

(b) "Residential building" includes single family homes, multifamily structures of three stories or fewer above grade, and modular and mobile homes.

(90) "RESNET" means the Residential Energy Services Network.]

[(90-1)] (88) — [(90-2)] (89) (text unchanged)

[(90-3)] (90) "Second control period [interim] adjustment for banked allowances" means, for allocation years 2015 through 2020, a reduction in the Maryland CO₂ Budget Trading Program base budget by the number of allowances equal to the number of 2012 and 2013 allowances held in general and compliance accounts established pursuant to the CO₂ Budget Trading Programs, that are in excess of the aggregate tons of 2012 and 2013 emissions from all CO₂ Budget sources in all of the participating states. Allowances in accounts opened by participating states are not included.

(91) (text unchanged)

(92) ["SF₆-containing equipment" means any equipment used for the transmission and distribution of electricity that contains sulfur hexafluoride (SF₆).] *“Third adjustment for banked allowances” means, for allocation years 2021 through 2025, an adjustment applied to the Maryland CO₂ Budget Trading Program base budget to address allowances held in general and compliance accounts, including compliance accounts established pursuant to the CO₂ Budget Trading Program, but not including accounts opened by participating states, that are in addition to the aggregate quantity of emissions from all CO₂ budget sources in all of the participating states at the end of the fourth control period in 2020 and as reflected in the CO₂ Allowance Tracking System on March 17, 2021.*

(93) (text unchanged)

(93-1) *“Total solids” means the total of all solids in a sample, including the total suspended solids, total dissolved solids, and volatile suspended solids.*

(94) — (96) (text unchanged)

(96-1) *“Verification” means the verification by an independent verifier that certain parts of a CO₂ emissions offset project consistency application and/or measurement, monitoring or verification report conforms to the requirements of this subtitle.*

(96-2) *“Vintage year” means the calendar year that a CO₂ allowance was originated.*

(97) — (100) (text unchanged)

[(101) "Whole-building energy performance" means the overall energy performance of a building, taking into account the integrated impact on energy usage of all building components and systems.

(102) "Whole-building retrofit" means any building project that involves the replacement of more than one building system, or set of building components, and requires a building permit.

(103) "Zero net energy building" means a building designed to produce as much energy, using renewable energy sources, as the building is projected to use, as measured on an annual basis.]

.03 Incorporation by Reference.

A. (text unchanged)

B. Documents Incorporated.

(1) — (4) (text unchanged)

[(5) Air Conditioning Contractors of America (ACCA), ANSI/ACCA 5 QI-2007, HVAC Quality Installation Specification: Residential and Commercial Heating, Ventilating, and Air Conditioning (HVAC) Applications, 2007.

(6) Air Conditioning Contractors of America (ACCA), Manual J: Residential Load Calculation, Eighth Edition, Version 2.00, Hank Rutkowski, P.E., March 2006.]

[(7)] (5) (text unchanged)

[(7-1) American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc., ANSI/ASHRAE Addenda a, b, e, f, and h, supplement to ANSI/ASHRAE Standard 62.1-2007: Ventilation for Acceptable Indoor Air Quality, 2008.

(8) American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc., ANSI/ASHRAE Standard 62.1-2007: Ventilation for Acceptable Indoor Air Quality, 2007.

(8-1) American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., ANSI/ASHRAE/IESNA Addenda a, b, c, g, h, i, j, k, l, m, n, p, q, s, t, u, w, y, ad, and aw, supplements to ANSI/ASHRAE/IESNA Standard 90.1-2007: Energy Standard for Buildings Except Low-Rise Residential Buildings, 2009.

(9) American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., ANSI/ASHRAE/IESNA Standard 90.1-2007: Energy Standard for Buildings Except Low-Rise Residential Buildings, I-P Edition, 2007.

(10) American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., ASHRAE Guideline 14-2002: Measurement of Energy and Demand Savings, 2002.]

[(11)] (6) (text unchanged)

[(12)] (7) Intergovernmental Panel on Climate Change, [IPCC Third] *Fifth Assessment Report, Climate Change [2001] 2013: The Physical [Scientific] Science Basis*, Chapter [6] 8 “*Anthropogenic and Natural Radiative Forcing*”, Section [12] 8.7 [“Global Warming Potentials”] “*Emission Metrics*” [(pages 385-391)] (pages 710-720).

[(13)] International Code Council, Inc. (ICC), International Energy Conservation Code, 2009.

(14) International Performance Measurement & Verification Protocol (IPMVP) Committee, International Performance Measurement & Verification Protocol, Volume I: Concepts and Options for Determining Energy and Water Savings, DOE/IGO-102002-1554, Chapter 3, "Option B: Retrofit Isolation," "Option C: Whole Building," and "Option D: Calibrated Simulation," March, 2002.

(15) International Performance Measurements & Verification Protocol (IPMVP) New Construction Subcommittee, International Performance Measurement & Verification Protocol: Concepts and Practices for Determining Energy Savings in New Construction, Volume III, Part I, Chapter 4, "Option D: Whole Building Calibrated Simulation," EVO 30000-1: 2006, January 2006.

(16) International Electrotechnical Commission (CEI/IEC), IEC/TR 62271, High-voltage switchgear and (controlgear-Part 303:) Use and handling of sulfur hexafluoride (SF₆) 2008.

(17) New Buildings Institute, Inc., Benchmark, Advanced Buildings Energy Benchmark for High Performance Buildings, Version 1.1, 2005.]

[(17-1)] (8) (text unchanged)

[(18)] Residential Energy Services Network, Inc. (RESNET) and the National Association of State Energy Officials, 2006 Mortgage Industry National Home Energy Rating Systems Standards, "Chapter Three: National Energy Rating Technical Standards," and "Appendix A: National Home Energy Rating Technical Guidelines, On-Site Inspection Procedures for Minimum Rated Features," 2009.

(19) U.S. Department of Energy, Office of Policy and International Affairs, Technical Guidelines, Voluntary Reporting of Greenhouse Gases (1605(b)) Program, "Section 3, Measurement Protocols for Forest Carbon Sequestration," in Chapter 1 (Emissions Inventories) Part I Appendix (Forestry), March 2006.]

[(20)] (9) U.S. Environmental Protection Agency (EPA), Inventory of U.S. Greenhouse Gas Emissions and Sinks, [1990—2007, EPA (430-R-09-004), Annex 3.10, (A-170): "Waste Characteristics Data," April 09, 2009] 1990-2010, Annex 3, Table A-180, April 15, 2012.

[(21)] (10) — [(22)] (11) (text unchanged)

.04 Selection and Responsibilities of CO₂ Budget Source Compliance Account Authorized Account Representatives.

A. — B. (text unchanged)

C. The CO₂ authorized account representative and alternate CO₂ authorized account representative of the CO₂ budget source shall be selected by an agreement binding on the owners and operators of the source and all CO₂ budget units at the source *and must act in accordance with the certificate of representation under §J of this regulation.*

D. — K. (text unchanged)

L. Delegation by CO₂ Authorized Account Representative or Alternate CO₂ Authorized Account Representative.

(1) — (5) (text unchanged)

(6) *A CO₂ authorized account representative may delegate, to one or more natural persons, his or her authority to review information in the CO₂ allowance tracking system under this regulation.*

(7) *An alternate CO₂ authorized account representative may delegate, to one or more natural persons, his or her authority to review information in the CO₂ allowance tracking system under this regulation.*

(8) *In order to delegate authority to review information in the CO₂ allowance tracking system in accordance with §L6 and §L7 of this regulation, the CO₂ authorized account representative or alternate CO₂ authorized account representative, as appropriate, must submit to the Department a notice of delegation, in a format prescribed by the Department that includes the following:*

(a) *The name, address, e-mail address, telephone number, and facsimile transmission number of such CO₂ authorized account representative or alternate CO₂ authorized account representative;*

(b) *The name, address, e-mail address, telephone number and facsimile transmission number of each such natural person, herein referred to as the “reviewer”;*

(c) *For each such natural person, a list of the type of information under §L6 and §L7 of this regulation for which authority is delegated to him or her; and*

(d) *The following certification statements by such CO₂ authorized account representative or alternate CO₂ authorized account representative:*

(i) *“I agree that any information that is reviewed by a natural person identified in this notice of delegation and of a type listed for such information accessible by the reviewer in this notice of delegation and that is made when I am a CO₂ authorized account representative or alternate CO₂ authorized account representative, as appropriate, and before this notice of delegation is superseded by another notice of delegation under COMAR 26.09.01.04L shall be deemed to be a reviewer by me.”*

(ii) “Until this notice of delegation is superseded by another notice of delegation under COMAR 26.09.01.04L, I agree to maintain an e-mail account and to notify the Department or its agent immediately of any change in my e-mail address unless delegation authority by me under COMAR 26.09.01.04L is terminated.”

(9) A notice of delegation submitted under §L8 of this regulation shall be effective, with regard to the CO₂ authorized account representative or alternate CO₂ authorized account representative identified in such notice, upon receipt of such notice by the Department or its agent and until receipt by the Department or its agent of a superseding notice of delegation by such CO₂ authorized account representative or alternate CO₂ authorized account representative as appropriate. The superseding notice of delegation may replace any previously identified review, add a new review, or eliminate entirely any delegation of authority.

.05 Selection and Responsibilities of General Account Authorized Account Representatives.

A. — K. (text unchanged)

L. Delegation by CO₂ Authorized Account Representative.

(1) — (6) (text unchanged)

(7) A CO₂ authorized account representative may delegate, to one or more natural persons, his or her authority to review information in the CO₂ allowance tracking system under this regulation.

(8) An alternate CO₂ authorized account representative may delegate, to one or more natural persons, his or her authority to review information in the CO₂ allowance tracking system under this regulation.

(9) In order to delegate authority to review information in the CO₂ allowance tracking system in accordance with §L7 and §L8 of this regulation, the CO₂ authorized account representative or alternate CO₂ authorized account representative, as appropriate, must submit to the Department a notice of delegation, in a format prescribed by the Department that includes the following:

(a) The name, address, e-mail address, telephone number, and facsimile transmission number of such CO₂ authorized account representative or alternate CO₂ authorized account representative;

(b) The name, address, e-mail address, telephone number and facsimile transmission number of each such natural person, herein referred to as the “reviewer”;

(c) For each such natural person, a list of the type of information under §L7 and §L8 of this regulation for which authority is delegated to him or her; and

(d) The following certification statements by such CO₂ authorized account representative or alternate CO₂ authorized account representative:

(i) “I agree that any information that is reviewed by a natural person identified in this notice of delegation and of a type listed for such information accessible by the reviewer in this notice of delegation and that is made when I am a CO₂ authorized account representative or alternate CO₂ authorized account representative, as appropriate, and before this notice of delegation is superseded by another notice of delegation under COMAR 26.09.01.05L shall be deemed to be a reviewer by me.”

(ii) “Until this notice of delegation is superseded by another notice of delegation under COMAR 26.09.01.05L, I agree to maintain an e-mail account and to notify the Department or its agent immediately of any change in my e-mail address unless delegation authority by me under COMAR 26.09.01.05L is terminated.”

(10) A notice of delegation submitted under §L9 of this regulation shall be effective, with regard to the CO₂ authorized account representative or alternate CO₂ authorized account representative identified in such notice, upon receipt of such notice by the Department or its agent and until receipt by the Department or its agent of a superseding notice of delegation by such CO₂ authorized account representative or alternate CO₂ authorized account representative as appropriate. The superseding notice of delegation may replace any previously identified review, add a new review, or eliminate entirely any delegation of authority.

[(7)] (11) (text unchanged)

M. (text unchanged)

N. Closing of General Accounts.

(1) (text unchanged)

(2) If a general account shows no activity for a period of [6 years] 1 year or more and does not contain any CO₂ allowances, the Department may notify the CO₂ authorized account representative for the account that the account will be closed [20] 30 business days after the notice is sent.

(3) The general account shall be closed after the [20-day] 30-day period unless, before the end of the [20-day] 30-day period, the Department receives the following:

(a) — (b) (text unchanged)

.06 (text unchanged).

Title 26 DEPARTMENT OF THE ENVIRONMENT
Subtitle 09 MARYLAND CO₂ BUDGET TRADING PROGRAM
Chapter 02 Applicability, Determining Compliance, and Allowance Distribution

Authority: Environment Article, §§1-101, 1-404, 2-103, and 2-1002(g), Annotated Code of Maryland

.01 — .02 (text unchanged).

.03 Distribution of CO₂ Allowances and Compliance.

A. The Maryland CO₂ Budget Trading Program consists of allowances to cover CO₂ emissions for the following:

- (1) [37,503,983] *18,671,045* tons for [2009—2013] *2018*;
- (2) [20,360,944] *17,931,922* tons for [2014] *2019*;
- (3) [19,851,920] *17,483,623* tons for [2015] *2020*;
- (4) [19,355,622] *16,790,271* tons for [2016] *2021*;
- (5) [19,149,790] *16,281,475* tons for [2017] *2022*;
- (6) [18,671,045] *15,772,679* tons for [2018] *2023*;
- (7) [18,204,269] *15,263,882* tons for [2019] *2024*; [and]
- (8) [17,749,162] *14,755,086* tons for [2020] *2025* [and each succeeding calendar year.];
- (9) *14,246,290* tons for *2026*;
- (10) *13,737,494* tons for *2027*;
- (11) *13,228,698* tons for *2028*;
- (12) *12,719,902* tons for *2029*; and
- (13) *12,211,106* tons for *2030* and each succeeding calendar year.

B. CO₂ Allowances Available for Allocation. For allocation years 2014 through [2020] *2031*, the Maryland CO₂ Budget Trading Program adjusted budget shall be the maximum number of allowances available for allocation in a given allocation year, except for CO₂ offset allowances and CO₂ CCR allowances.

C. Cost Containment Reserve Allocation. The Department shall allocate CO₂ CCR allowances, separate from and in addition to the Maryland CO₂ Budget Trading Program base budget set forth in §A of this regulation, to the Consumer Energy Efficiency Account. The CCR allocation is for the purpose of containing the cost of CO₂ allowances. The Department shall allocate CO₂ CCR allowances in the following manner:

- (1) (text unchanged)
- (2) On or before January 1, 2015, and each calendar year thereafter *through 2020*, the Department shall allocate CO₂ CCR allowances sufficient to replenish Maryland's 22.6 percent proportional share of the CCR.
- (3) *On or before January 1, 2021, and each calendar year thereafter, the Department shall allocate current vintage year CCR allowances equal to the following:*
 - (a) *2,236,466 CCR allowances for 2018, 2019, and 2020;*
 - (b) *1,679,027 CCR allowances for 2021;*
 - (c) *1,628,147 CCR allowances for 2022;*
 - (d) *1,577,267 CCR allowances for 2023;*
 - (e) *1,526,388 CCR allowances for 2024;*
 - (f) *1,475,508 CCR allowances for 2025;*
 - (g) *1,424,629 CCR allowances for 2026;*
 - (h) *1,373,749 CCR allowances for 2027;*
 - (i) *1,322,869 CCR allowances for 2028;*
 - (j) *1,271,990 CCR allowances for 2029; and*
 - (k) *1,221,110 CCR allowances for 2030 and each succeeding calendar year.*
- (4) *The Department shall withdraw the number of CO₂ allowances that remain in the Consumer Energy Efficiency Account at the end of the prior calendar year.*

D. *Emissions Containment Reserve Withholding. The Department shall convert or transfer any CO₂ allowances that have been withheld from any auction(s) into the Emissions Containment Reserve Account. The ECR withholding is for the purpose of additional emissions reduction in the event of lower than anticipated emissions reduction costs. The Department shall withhold CO₂ ECR allowances in the following manner.*

(1) If the condition in COMAR 26.09.04.06B(4)(a) is met at an auction, then the maximum number of CO₂ ECR allowances that will be withheld from that auction will be equal to the following, minus the total quantity of CO₂ ECR allowances that have been withheld from any prior auction(s) in that calendar year:

- (i) 1,679,027 for 2021;
- (ii) 1,628,148 for 2022;
- (iii) 1,577,268 for 2023;
- (iv) 1,526,388 for 2024;
- (v) 1,475,509 for 2025;
- (vi) 1,424,629 for 2026;
- (vii) 1,373,749 for 2027;
- (viii) 1,322,870 for 2028;
- (ix) 1,271,990 for 2029; and
- (x) 1,221,111 for 2030 and each succeeding calendar year.

(2) Any CO₂ ECR allowances withheld from an auction will be transferred into the Emission Containment Reserve Account.

(3) Allowances that have been transferred into the Emission Containment Reserve Account shall not be withdrawn.

[D.] E. (text unchanged)

[E.] F. [Interim] Adjustment for First Control Period Banked Allowances. By January 15, 2014, the Department shall [determine] establish the [interim] adjustment for first control period banked allowances as 1,863,361 allowances applicable to allocation years 2014 through 2020 [by use of the following formula:].

[(1) FCPIABA is the first control period interim adjustment for banked allowances in tons;

(2) FCPA is the total quantity of allocation year 2009, 2010, and 2011 CO₂ allowances held in general and compliance accounts, including compliance accounts established pursuant to the Maryland CO₂ Budget Trading Program, but not including accounts opened by participating states, as reflected in the CO₂ Allowance Tracking System (COATS) on January 1, 2014; and

(3) RS% is 0.2237, which is Maryland's 2013 budget divided by the 2013 regional budget.]

[F.] G. [Interim] Adjustment for Second Control Period Banked Allowances. On March 15, 2014, the Department shall [determine] establish the [interim] adjustment for second control period banked allowances as 3,106,578 allowances applicable to allocation years 2015 through 2020 [by use of the following formula:].

[(1) SCPIABA is the second control period interim adjustment for banked allowances in tons;

(2) SCPA is the total quantity of allocation year 2012 and 2013 CO₂ allowances held in general and compliance accounts, including compliance accounts established pursuant to the Maryland CO₂ Budget Trading Program, but not including accounts opened by participating states, as reflected in the CO₂ Allowance Tracking System (COATS) on March 17, 2014; and

(3) SCPE is the total quantity of 2012 and 2013 emissions from all CO₂ budget sources in all participating states, reported pursuant to the Maryland CO₂ Budget Trading Program as reflected in the CO₂ Allowance Tracking System (COATS) on March 17, 2014.

(4) RS% is 0.2237, which is Maryland's 2013 budget divided by the 2013 regional budget.]

H. Third Adjustment for Banked Allowances. On March 15, 2021, the Department shall establish the third adjustment for banked allowances quantity for allocation years 2021 through 2025 through the application of the following formula:

$$TABA = ((TA - TAE)/5) \times RS\%$$

Where:

(1) TABA is the third adjustment for banked allowances quantity in tons;

(2) TA, third adjustment, is the total quantity of allowances of vintage years prior to 2021 held in general and compliance accounts, including compliance accounts established pursuant to the CO₂ Budget Trading Program, but not including accounts opened by participating states, as reflected in the CO₂ Allowance Tracking System (COATS) on March 15, 2021;

(3) TAE, third adjustment emissions, is the total quantity of 2018, 2019, and 2020 emissions from all CO₂ budget sources in all participating states, reported pursuant to the CO₂ Budget Trading Program as reflected in the CO₂ Allowance Tracking System (COATS) on March 15, 2021;

(4) RS% is Maryland's budget divided by the regional budget.

[G.] I. CO₂ Budget Trading Program Adjusted Budgets.

[(1) The Department shall determine the Maryland CO₂ Budget Trading Program adjusted budget for the 2014 allocation year by the following formula:

$$AB = BB - FCPIABA$$

Where:

(a) AB is the Maryland CO₂ Budget Trading Program 2014 adjusted budget;

(b) BB is the Maryland CO₂ Budget Trading Program 2014 base budget; and

(c) FCPIABA is the first control period interim adjustment for banked allowances quantity.]

[(2) (1) On April 15, 2014 the Department shall [determine] establish the Maryland CO₂ Budget Trading Program adjusted budgets for the [2015] 2018 through 2020 allocation years [by the following formula] as follows:

$$[AB = BB - (FCPIABA + SCPIABA)$$

Where:]

(a) [AB is the Maryland CO₂ Budget Trading Program adjusted budget] 13,701,106 allowances in 2018;

(b) [BB is the Maryland CO₂ Budget Trading Program base budget] 12,961,983 allowances in 2019; and

(c) [FCPIABA is the first control period interim adjustment for banked allowances; and] *12,513,684 allowances in 2020.*

[(d) SCPIABA is the second control interim adjustment for banked allowances.]

(2) *On April 15, 2021, the Department shall establish the Maryland CO₂ Budget Trading Program adjusted budgets for the 2021 through 2025 allocation years by the following formula:*

$$AB = BB - TABA$$

Where:

(a) *AB is the Maryland CO₂ Budget Trading Program adjusted budget;*

(b) *BB is the Maryland CO₂ Budget Trading Program base budget; and*

(c) *TABA is the third adjustment for banked allowances quantity in tons.*

(3) After making the determinations required by [§G(1)] §I(1) and (2) of this regulation, the Department will post on the Department website the CO₂ trading program adjusted base budgets for the [2014] 2021 through [2020] 2025 allocation years.

[H.] J. General Distribution of CO₂ Allowances.

(1) The Department shall open and manage a general account for the following:

(a) — (b) (text unchanged)

[(c) The Voluntary Renewable Set-aside Account;]

[(d)] (c) — [(e)] (d) (text unchanged)

(2) On or before January 31 of each calendar year, the Department shall allocate all CO₂ allowances from the CO₂ Budget Trading Program to the Consumer Energy Efficiency Account, except as directed in [§H(3)] §J(3) and (4) of this regulation.

(3) The Department shall allocate CO₂ allowances from the Consumer Energy Efficiency Account to each of the following accounts, *except as directed in COMAR 26.09.02.09*, so that the total number of allowances in each account is:

(a) (text unchanged)

(b) 1,600,000 in the Long Term Contract (LTC) Set-aside Account; *and*

[(c) 350,000 in the Voluntary Renewable Set-aside Account; and]

[(d)] (c) [1,875,199] *The following number of allowances in the Clean Generation Set-aside Account [.] :*

(i) *1,687,679 for 2018;*

(ii) *1,500,159 for 2019;*

(iii) *1,312,639 for 2020;*

(iv) *1,125,119 for 2021; and*

(v) *937,599 for 2022.*

(4) If, on December 31 of each year, allowances have been sold or awarded from a set-aside account such that the number of allowances in the set-aside account falls below the required allocation in [§H(3)(a)—(d)] §J(3)(a)—(c) of this regulation, as applicable, that account shall be replenished from the Consumer Energy Efficiency Account in the following calendar year using allowances from that calendar year.

[I.] K. Demonstrating Compliance.

(1) (text unchanged)

(2) As of the CO₂ allowance transfer deadline for an interim control period, the owners and operators of each CO₂ budget source and each CO₂ budget unit at the source shall hold, in the source's compliance account for deduction under [§I] §K of this regulation, CO₂ allowances for no less than 50 percent of the total CO₂ emissions for the interim control period from all CO₂ budget units at the source.

(3) — (4) (text unchanged)

(5) The identification of available CO₂ allowances for compliance deduction by serial number or by default is as follows:

(a) (text unchanged)

(b) In the absence of an identification or in the case of a partial identification of available CO₂ allowances by serial number, the Department shall deduct CO₂ allowances for a control period or interim control period in the following descending order:

(i) — (ii) (text unchanged)

(iii) Subject to the relevant compliance deduction limitations identified in [§I(3)(c)] §K(3)(c) of this regulation, any CO₂ offset allowances transferred and recorded in the compliance account, in chronological order; and

(iv) Any CO₂ allowances, other than those identified in [§I(5)(b)(i)—(iii)] §K(5)(b)(i)—(iii) of this regulation, that are available for deduction in the order they were recorded.

(6) Deductions for Excess Emissions.

(a) If a CO₂ budget source has excess emissions, the Department shall deduct [,] *CO₂ allowances* from the CO₂ budget source's compliance account [, CO₂ allowances from allocation years that occur after the control period or interim control period in which the excess emissions or excess interim emissions occurred,] equal to three times the excess emissions.

(b) — (d) (text unchanged)

(7) — (9) (text unchanged)

.04 Permits.

A. [General] CO₂ Budget Permit Requirements.

(1) — (3) (text unchanged)

B. — E. (text unchanged)

.05 (text unchanged).

.06 Limited Industrial Exemption Set-aside Account.

A. (text unchanged)

B. A CO₂ budget source is exempt from the requirements of Regulation [.03D] .03E of this chapter if it meets the following criteria:

(1) (text unchanged)

(2) Submits a request for and receives the Department's approval of a climate action plan which requires reduction of [CO₂] CO₂e emissions through reasonably available reduction practices not limited to the following:

(a) — (d) (text unchanged)

(3) (text unchanged)

C. — G. (text unchanged)

.07 — .10 (text unchanged).

.11 Record Keeping and Reporting.

A. — G. (text unchanged)

H. Ongoing Quality Assurance and Quality Control.

(1) — (2) (text unchanged)

(3) Nonbilling Meters.

(a) Certain types of equipment such as potential transformers, current transformers, nozzle and [venture] *venturi* type meters, and the primary element of an orifice plate only require an initial certification of calibration and do not require periodic recalibration unless the equipment is physically changed.

(b) — (e) (text unchanged)

(4) (text unchanged)

I. (text unchanged)

Title 26 DEPARTMENT OF THE ENVIRONMENT

Subtitle 09 MARYLAND CO₂ BUDGET TRADING PROGRAM

Chapter 03 Offset Projects

Authority: Environment Article, §§1-101, 1-404, 2-103, and 2-1002(g), Annotated Code of Maryland

.01 Purpose.

The Department shall provide for the award of CO₂ offset allowances to project sponsors of CO₂ emissions offset projects that have demonstrated a reduction or avoidance of atmospheric loading of CO₂, CO₂ equivalent, or sequestered carbon. These requirements ensure that the awarded CO₂ offset allowances represent real, additional, verifiable, enforceable, and permanent CO₂ equivalent emission reductions or carbon sequestration. Subject to the relevant compliance deduction limitations identified in COMAR [26.09.02.03I] 26.09.02.03K, CO₂ offset allowances may be used by any CO₂ budget source for compliance purposes.

.02 General Requirements for CO₂ Emission Offset Projects.

A. Eligible CO₂ Emissions Offset Projects. In order to qualify for the award of CO₂ offset allowances, the following offset projects shall satisfy all applicable requirements identified in this chapter:

(1) (text unchanged)

[(2) Reduction in emissions of sulfur hexafluoride (SF₆);]

[(3)] (2) Sequestration of carbon due to reforestation, improved forest management, or avoided conversion; *and*

[(4) Reduction or avoidance of CO₂ emissions from natural gas, oil, or propane end-use combustion due to end-use energy efficiency; and]

[(5)] (3) (text unchanged)

B. — E. (text unchanged)

F. Application Process.

(1) (text unchanged)

(2) Consistency Application Deadlines.

(a) (text unchanged)

(b) For offset projects involving reforestation, improved forest management or avoided conversion, the consistency application must be submitted no later than 1 year after the date the offset project is commenced, except as described in Regulation [1.05J] .04J of this chapter.

G. — I. (text unchanged)

.03 Landfill Methane Capture and Destruction Project Standards.

A. — C. (text unchanged)

D. Emissions Baseline Determination. The emissions baseline represents the potential fugitive landfill emissions of methane (CH₄) measured in tons of CO₂e as represented by the CH₄ collected and metered for thermal destruction as part of the offset project and calculated in accordance with the following:

Emissions (tons CO₂e) = (V × M × (1-OX) × GWP)/2000

where:

(1) — (3) (text unchanged)

(4) GWP = [23] 28 for the CO₂e global warming potential of CH₄.

E. Calculating Emissions Reductions. Emissions reductions shall be determined based on potential fugitive CH₄ emissions that would have occurred at the landfill if metered CH₄ collected from the landfill for thermal destruction as part of the offset project was not collected and destroyed. CO₂e emissions reductions shall be calculated as follows:

Emissions Reductions (tons CO₂e) = (V × M × (1-OX) × C_{ef} × GWP)/2000

where:

(1) — (4) (text unchanged)

(5) GWP = [23] 28 for the CO₂e global warming potential of CH₄.

F. (text unchanged)

[.04 Reduction in Emissions of Sulfur Hexafluoride (SF₆) Project Standards.

A. Qualifications.

(1) Offset projects that prevent emissions of sulfur hexafluoride to the atmosphere from equipment in the electricity transmission and distribution sector through capture and storage, recycling, or destruction, qualify for the award of CO₂ offset allowances if they meet the requirements of this section.

(2) Eligible offset projects shall consist of incremental actions beyond those taken during the baseline year to achieve a reduction in SF₆ emissions relative to the baseline year and may include an expansion of existing actions.

(3) The identified actions to be taken shall be consistent with the guidance provided in International Electrotechnical Commission (CEI/IEC), IEC/TR 62271, High-voltage switchgear and (controlgear—Part 303:) Use and handling of sulfur hexafluoride (SF₆).

(4) SF₆ Entity-Wide Emissions Rate.

(a) Eligible offset projects shall have an SF₆ entity-wide emissions rate for the baseline year that is less than the applicable emissions rate for the appropriate region.

(b) To determine the regional SF₆ emissions rate for the state in which the SF₆ offset project is located, Tables I and II in §A(4)(e) and (f) of this regulation are used.

(c) The entity-wide SF₆ emissions rate shall be calculated as follows:

SF₆ Emissions Rate (percent) = (Total SF₆ Emissions for Reporting Year) / (Total SF₆ Nameplate Capacity at End of Reporting Year)

where:

SF₆ Nameplate Capacity refers to all SF₆ -containing equipment owned or operated by the entity, at full and proper SF₆ charge of the equipment rather than the actual charge of the equipment which may reflect leakage.

(d) In order for the SF₆ offset project to be eligible, the SF₆ entity-wide emissions rate for the baseline year shall be less than the applicable emissions rate for the appropriate region.

(e) Table I. Identification of Regions.

Region A	Region B	Region C	Region D	Region E
Connecticut	Alabama	Colorado	Arkansas	Alaska
Delaware	District of Columbia	Illinois	Iowa	Arizona
Maine	Florida	Indiana	Kansas	California
Massachusetts	Georgia	Michigan	Louisiana	Hawaii
New Jersey	Kentucky	Minnesota	Missouri	Idaho
New York	Maryland	Montana	Nebraska	Nevada
New Hampshire	Mississippi	North Dakota	New Mexico	Oregon
Pennsylvania	North Carolina	Ohio	Oklahoma	Washington
Rhode Island	South Carolina	South Dakota	Texas	
Vermont	Tennessee	Utah		
	Virginia	Wisconsin		
	West Virginia	Wyoming		

(f) Table II. Emissions Rate Performance Standards.

Region	Emission Rate ¹
Region A	9.68%
Region B	5.22%
Region C	9.68%
Region D	5.77%
Region E	3.65%
U.S. (National)	9.68%

¹ Based on weighted average 2004 emissions rates for U. S. EPA SF₆ Partnership utilities in each region. If the weighted average emissions rate in a region is higher than the national weighted average, the default performance standard is the national weighted average emissions rate.

B. An SF₆ offset project is eligible even if the SF₆ entity-wide emissions rate in the baseline year exceeds the applicable rate if the project sponsor demonstrates and the Department determines that at least two of the following factors prevent optimal management of SF₆:

(1) The entity is comprised of older than average installed transmission and distribution equipment in relation to the national average age of equipment;

(2) A majority of the entity's electricity load is served by equipment that is located underground, and poor accessibility of the underground equipment precludes management of SF₆ emissions through regular ongoing maintenance;

(3) The inability to take a substantial portion of equipment out of service because the activity would impair system reliability;

(4) Required equipment purpose or design for a substantial portion of the entity transmission and distribution equipment results in inherently leak-prone equipment.

C. Offset Project Description.

(1) The offset project sponsor shall provide a detailed narrative of the offset project actions to be taken including documentation that the offset project meets all eligibility requirements of this regulation.

(2) The offset project narrative shall include the following information:

(a) Description of the transmission or distribution entity in sufficient detail to specify the service territory served by the entity; and

(b) The owner and operator of the transmission or distribution entity.

D. Emissions Baseline Determination.

(1) If the consistency application is filed after June 30, 2009, baseline SF₆ emissions shall be determined based on annual entity-wide reporting of SF₆ emissions for the calendar year immediately preceding the calendar year in which the consistency application is filed.

(2) The reporting entity shall systematically track and account for all entity-wide uses of SF₆ in order to determine entity-wide emissions of SF₆ including all electric transmission and distribution assets and all SF₆-containing and SF₆-handling equipment owned or operated by the reporting entity.

(3) Emissions shall be determined based on the following mass balance method:

SF₆ Emissions (pounds) = (SF₆ Change in Inventory) + (SF₆ Purchases and Acquisitions) - (SF₆ Sales and Disbursements) - (Change in Total SF₆ Nameplate Capacity of Equipment)

where:

(a) Change in inventory = the difference between the quantity of SF₆ gas in storage at the beginning of the reporting year and the quantity in storage at the end of the reporting year. The change in inventory is negative if the quantity of SF₆ gas in storage increases over the course of the year. Quantity in storage includes all SF₆ gas contained in cylinders, gas carts, and other storage containers but not to SF₆ gas held in SF₆-using operating equipment.

(b) Purchases and Acquisitions of SF₆ = the sum of all the SF₆ gas acquired from other parties during the reporting year, as contained in storage containers or SF₆-using operating equipment.

(c) Sales and disbursements of SF₆ = the sum of all the SF₆ gas sold or otherwise disbursed to other parties during the reporting year, as contained in storage containers and SF₆-using operating equipment.

(d) Change in total SF₆ nameplate capacity of equipment = the net change in the total volume of SF₆-containing operating equipment during the reporting year. The net change in nameplate capacity is equal to new equipment nameplate capacity minus retired equipment nameplate capacity. This quantity is negative if the retired equipment has a total nameplate capacity larger than the total nameplate capacity of the new equipment. "Total nameplate capacity" refers to the full and proper SF₆ charge of the equipment rather than to the actual charge, which may reflect leakage.

(4) Calculation of Equivalent CO₂ Emissions. Equivalent CO₂ emissions are calculated as follows:

Emissions (tons CO₂e) = [(V_{iby} - V_{iey}) + (PA_{psd} + PA_e + PA_{rre}) - (SD_{op} + SD_{rs} + SD_{df} + SD_{sor}) - (CNP_{ne} - CNP_{rse})] × GWP/2000
where (all SF₆ values in pounds):

(a) V_{iby} = SF₆ inventory in cylinders, gas carts, and other storage containers (not SF₆-containing operating equipment) at the beginning of the reporting year;

(b) V_{iey} = SF₆ inventory in cylinders, gas carts, and other storage containers (not SF₆-containing operating equipment) at the end of the reporting year;

(c) PA_{psd} = SF₆ purchased from suppliers or distributors in cylinders;

(d) PA_e = SF₆ provided by equipment manufacturers with or inside SF₆-containing operating equipment;

(e) PA_{rre} = SF₆ returned to the reporting entity after off-site recycling;

(f) SD_{op} = Sales of SF₆ to other parties, including gas left in SF₆-containing operating equipment that is sold;

(g) SD_{rs} = Returns of SF₆ to supplier (producer or distributor);

(h) SD_{df} = SF₆ sent to destruction facilities;

(i) SD_{sor} = SF₆ sent off-site for recycling;

(j) CNP_{ne} = Total SF₆ nameplate capacity of new SF₆-containing operating equipment at proper full charge;

(k) CNP_{rse} = Total SF₆ nameplate capacity of retired or sold SF₆-containing operating equipment at proper full charge; and

(l) GWP = CO₂e global warming potential of SF₆ (22,200).

(5) Calculating Emissions Reductions. Emissions reductions shall represent the annual entity-wide emissions reductions of SF₆ for the reporting entity, relative to emissions in the baseline year. Emissions reductions shall be determined as follows:

Emissions Reduction (tons CO₂e) = (Total Pounds of SF₆ Emissions in Baseline Reporting Year) - (Total Pounds of SF₆ Emissions in Reporting Year) × GWP/2000

where: GWP = CO₂e global warming potential of SF₆ (22,200).

E. Monitoring and Verification Requirements. The annual monitoring and verification report shall include supporting material detailing the calculations and data used to determine SF₆ emissions reductions and the project sponsor shall:

(1) Identify the facilities managed by the entity from which all SF₆ gas is procured and disbursed and maintain an entity-wide log of all SF₆ gas procurements and disbursals, which shall include:

(a) The weight of each cylinder transported before shipment from the facility and the weight of each cylinder after return to the facility;

(b) A specific cylinder log for each cylinder that is used to fill equipment with SF₆ or reclaim SF₆ from equipment, which is retained with the cylinder; and

(c) The location and specific identifying information of the equipment being filled, or from which SF₆ is reclaimed, and the weight of the cylinder before and after this activity;

(2) Provide a current entity-wide inventory, certified by an accredited independent verifier, of all SF₆ -containing operating equipment and all other SF₆ -related items, including cylinders, gas carts, and other storage containers used by the entity; and

(3) Provide a certified monitoring and verification plan as part of the consistency application, including an SF₆ inventory management and auditing protocol and a process for quality assurance and quality control of inventory data.]

[.05] .04 Sequestration of Carbon due to Reforestation, Improved Forest Management, or Avoided Conversion.

A. — D. (text unchanged)

E. Calculating Carbon Sequestered. Net GHG reductions and GHG removal enhancements shall be calculated as required by section 6 of the forest offset protocol. The project's risk reversal rating shall be calculated [as required by Appendix D of the forest offset protocol] *using the Determination of a Forest Project's Reversal Risk Rating assessment worksheet in Appendix D of the forest offset protocol.*

F. Monitoring and Verification Requirements. Monitoring and verification is subject to the following requirements:

(1) (text unchanged)

(2) The consistency application shall include a monitoring and verification plan certified by an independent verifier accredited pursuant to Regulation [.08] .06 of this chapter, which shall consist of a forest carbon inventory program, as required by section 8.1 of the forest offset protocol; and

(3) (text unchanged)

G. (text unchanged)

H. Prior to the award of CO₂ offset allowances pursuant to Regulation [.09] .07 of this chapter, or to any surrender of allowances pursuant to §I of this regulation, any quantity expressed in metric tons, or metric tons of CO₂ equivalent, shall be converted to tons using the conversion factor specified in COMAR 26.09.01.02B(93).

I. (text unchanged)

J. Timing of Forest Offset Projects. The Department may award CO₂ offset allowances under Regulation [.09] .07 of this chapter only for forest offset projects that are initially commenced on or after January 1, 2014.

K. Projects that Have Been Awarded Credits Under a Voluntary Greenhouse Gas Reduction Program.

(1) (text unchanged)

(2) The provisions of Regulation .02C(6) and F(2)(b) may not apply to forest projects that have been awarded credits under a voluntary greenhouse gas reduction program provided that the following conditions are satisfied:

(a) The project satisfies all other general requirements of this chapter, including all specific requirements of this regulation, for all reporting periods for which the project has been awarded credits under a voluntary greenhouse gas program and also intends to be awarded CO₂ offset allowances pursuant to Regulation [.09] .07 of this chapter;

(b) At the time of submittal of the consistency application for the project, the project sponsor submits forest offset data reports and a monitoring and verification report meeting all requirements of §§F and G of this regulation that covers all reporting periods for which the project has been awarded credits under a voluntary greenhouse gas program and also seeks an award of CO₂ offset allowances pursuant to Regulation [.09] .07 of this chapter; and

(c) The voluntary greenhouse gas program has published information on its website to allow the Department to verify the information included in the consistency application, and the consistency application includes information sufficient to allow the Department to make the following determinations:

(i) (text unchanged)

(ii) The project sponsor or voluntary greenhouse gas program has cancelled or retired all credits that were awarded for carbon sequestration that occurred during the time periods for which the project intends to be awarded CO₂ offset allowances pursuant to Regulation [.09] .07 of this chapter, and such credits were cancelled or required for the sole purpose of allowing the project to be awarded CO₂ offset allowances pursuant to Regulation [.09] .07 of this chapter.

[.06 Reduction or Avoidance of CO₂ Emissions from Natural Gas, Oil, or Propane End-Use Combustion Due to End-Use Energy Efficiency.

A. Offset projects that reduce CO₂ emissions by reducing on-site combustion of natural gas, oil, or propane for end-use in an existing or new commercial or residential building by improving the energy efficiency or fuel usage or the energy-efficient delivery of energy services qualify for the award of CO₂ offset allowances. Eligible new buildings are limited to new buildings that are designed to replace an existing building on the offset project site, or new buildings that are zero net energy buildings.

B. Eligible offset projects shall reduce CO₂ emissions through one or more of the following energy conservation measures (ECMs):

- (1) Improvements in the energy efficiency of combustion equipment that provides space heating and hot water, including a reduction in fossil fuel consumption through the use of solar and geothermal energy;
- (2) Improvements in the efficiency of heating distribution systems, including proper sizing and commissioning of heating systems;
- (3) Installation or improvement of energy management systems;
- (4) Improvement in the efficiency of hot water distribution systems and reduction in demand for hot water;
- (5) Measures that improve the thermal performance of the building envelope or reduce building envelope air leakage;
- (6) Measures that improve the passive solar performance of buildings and utilization of active heating systems using renewable energy; and
- (7) Fuel switching to a less carbon-intensive fuel for use in combustion systems, including the use of liquid or gaseous eligible biomass, excluding conversions to electricity.

C. Performance Standards.

- (1) Commercial HVAC systems shall meet the applicable sizing and installation requirements of:
 - (a) ANSI/ASHRAE/IESNA Standard 90.1-2007: Energy Standard for Buildings Except Low-Rise Residential Buildings; and
 - (b) ANSI/ASHRAE Standard 62.1-2007: Ventilation for Acceptable Indoor Air Quality.
- (2) Residential HVAC systems shall meet:
 - (a) The applicable sizing specifications of Air Conditioner Contractors of America (ACCA), Manual J: Residential Load Calculation, Eighth Edition, Version 2.00; and
 - (b) The applicable installation specifications of Air Conditioning Contractors of America (ACCA), ANSI/ACCA 5 QI-2007, HVAC Quality Installation Specification: Residential and Commercial Heating, Ventilating, and Air Conditioning (HVAC) Applications.
- (3) Commercial buildings shall exceed the energy performance requirements of ANSI/ASHRAE/IESNA Standard 90.1-2007: Energy Standard for Buildings Except Low-Rise Residential Buildings, by 30 percent, with the exception of multi-family residential buildings classified as commercial by ANSI/ASHRAE/IESNA Standard 90.1-2007, which shall exceed these energy performance requirements by 20 percent.
- (4) Residential buildings shall exceed the energy performance requirements of the International Code Council, Inc. (ICC), International Energy Conservation Code by 30 percent.

D. Commercial Fuel Burning Equipment. Commercial fuel burning equipment shall meet or exceed the following energy efficiency criteria:

Minimum Commercial Fuel Burning Equipment Energy Efficiency.

Technology	Size (Btu/hr)	Rating Method	Minimum Efficiency
Gas-fired ¹	125,000—300,000	AFUE	88%
	300,000—12,500,000	Thermal Efficiency ²	90%
Oil-fired	>300,000	Thermal Efficiency	88%

¹ Gas-fired boilers shall be installed with controls that allow the boiler to operate in condensing mode and installed with vents designed for positive vent static pressure and vent gas temperature that leads to condensate production in the vent.

² Thermal efficiency is defined as useful energy output (Btu) divided by energy input (Btu), and presented as a percentage. This shall be measured under steady state conditions, at full treated useful thermal output, 140°F supply from, and 120°F return water temperature to, the boiler.

E. Residential Combustion Equipment. Residential combustion equipment, including furnaces, boilers, and water heaters, shall meet or exceed the following energy efficiency criteria:

Minimum Residential Combustion Equipment¹ Energy Efficiency.

Technology	Rating Method	Minimum Efficiency
Gas-fired furnace	AFUE	94%
Oil-fired furnace	AFUE	92%
Gas/oil-fired boiler	AFUE	90%
Gas/oil-fired water heater	Energy Factor	0.62

¹ For furnaces, defined as equipment with a heat input rate of less than 225,000 Btu/hr; for boilers, defined as equipment with a heat input rate of less than 300,000 Btu/hr; for water heaters, defined as equipment subject to 10 CFR 430.

F. Other Conservation Measures.

- (1) All other energy conservation measures implemented as part of an offset project shall meet the prescriptive requirements, as applicable, in New Buildings Institute, Inc., Benchmark, Advanced Buildings Energy Benchmark for High Performance Buildings

(EBHPB), or State building energy codes, as defined in Public Utilities Article, §§7-401(e), Annotated Code of Maryland, whichever result in better energy performance.

(2) Energy conservation measures without specified performance criteria in the referenced EBHPB shall meet the requirements of:

(a) Federal Energy Management Program (FEMP) Product Energy Efficiency Recommendations, issued pursuant to Executive Orders 13123 and 13221; or

(b) Energy Star criteria issued jointly by the U.S. EPA and U.S. Department of Energy, whichever result in better energy performance.

(3) For offset projects initiated on or after January 1, 2009, the project sponsor shall demonstrate to the satisfaction of the Department that the energy conservation measures implemented as part of the offset project have a market penetration rate of less than 5 percent.

G. Offset Project Description. The project sponsor shall provide a detailed narrative of the offset project actions to be taken, including documentation that the offset project meets the applicable eligibility requirements of this regulation. The offset project narrative shall include the following information:

(1) Location and specifications of the building where the offset project actions will occur;

(2) Owner and operator of the building;

(3) The parties implementing the offset project, including lead contractor, subcontractors, and consulting firms;

(4) Specifications of equipment and materials to be installed as part of the offset project; and

(5) Building plans and offset project technical schematics, as applicable.

H. Emissions Baseline Determination.

(1) The emissions baseline shall be determined based on energy usage by fuel type for each energy conservation measure derived using historic fuel use data from the most recent calendar year for which data is available and multiplied by an emissions factor and oxidation factor for each respective fuel in §H(2) of this regulation.

(2) Emissions and Oxidation Factors.

Fuel	Emissions Factor (lbs. CO ₂ /MMBtu)	Oxidation Factor
Natural Gas	116.98	0.995
Propane	139.04	0.995
Distillate Fuel Oil	161.27	0.99
Kerosene	159.41	0.99

(3) The annual baseline energy usage shall be determined as follows:

$$\text{Energy Usage (MMBtu)} = \text{BEU}_{\text{AECM}} \times A$$

where:

(a) BEU_{AECM} = Annual pre-installation baseline energy use by fuel type (MMBtu) attributable to the applications to be targeted by the energy conservation measure. If applicable building codes or equipment standards require that equipment or materials installed as part of the offset project meet certain minimum energy performance requirements, baseline energy usage for the application shall assume that equipment or materials are installed that meet these minimum requirements. For offset projects that replace existing combustion equipment, the assumed minimum energy performance required by applicable building codes or equipment standards shall be that which applies to new equipment that uses the same fuel type as the equipment being replaced. Baseline energy usage shall be determined in accordance with applicable requirements in RESNET 2006 Mortgage Industry National Home Energy Rating Systems Standards, "Chapter Three: National Energy Rating Technical Standards," and "Appendix A: National Home Energy Rating Technical Guidelines, On-Site Inspection Procedures for Minimum Rated Features".

(b) A = Adjustments to account for differing conditions during the pre-installation and post-installation time periods such as weather, building occupancy, and changes in building use or function. Adjustments shall be determined in accordance with the applicable requirements.

(4) Annual baseline emissions shall be determined as follows:

$$\text{Emissions}(\text{lbs. CO}_2) = \sum_{i=1}^n \text{BEU}_i \times \text{EF}_i \times \text{OF}_i$$

where:

(a) BEU_i = Annual baseline energy usage for fuel type i in millions of Btu;

(b) EF_i = Emissions factor pounds of CO₂ per million Btu for fuel type; and

(c) OF_i = Oxidation factor for fuel type i.

(5) Calculating Emissions Reductions.

(a) Emissions reductions shall be determined based upon annual energy savings by fuel type for each energy conservation measure, multiplied by the emissions factor and oxidation factor for the respective fuel type.

(b) Annual energy savings shall be determined as follows:

$$\text{Energy Savings (MMBtu)} = (\text{BEU}_{\text{AECM}} \times A) - (\text{PIEU}_{\text{ECM}} \times A)$$

where:

(i) BEU_{AECM} = Annual pre-installation baseline energy use by fuel type (MMBtu).

(ii) PIEU_{ECM} = Annual post-installation energy use by fuel type (MMBtu) attributable to the energy conservation measure. Post-installation energy usage shall be determined in accordance with the applicable requirements.

(iii) A = Adjustments to account for any differing conditions during the two time periods (pre-installation and post-installation), such as weather, building occupancy, and changes in building use or function. Adjustments shall be determined in accordance with the applicable requirements.

(6) Annual emissions reductions shall be determined as follows:

$$\text{Emissions Reduction (lbs. CO}_2\text{)} = \sum_{i=1}^n ES_i \times EF_i \times OF_i$$

where:

(a) ES_i = Energy savings for fuel type i (MMBtu);

(b) EF_i = Emissions factor (lbs. CO_2 /MMBtu) for fuel type I; and

(c) OF_i = Oxidation factor for fuel type i.

(7) Monitoring and Verification Requirements.

(a) As part of the consistency application, the project sponsor shall provide a monitoring and verification plan certified by an independent accredited verifier. Annual monitoring and verification reports shall be certified by an independent accredited verifier.

(b) The independent verifiers shall conduct a site audit when reviewing the first monitoring and verification report submitted by the project sponsor, except for offset projects that save less than 1,500 million Btu per year. For offset projects that save less than 1,500 million Btu per year, the project sponsor shall provide the independent verifier with equipment specifications and copies of equipment invoices and other relevant offset project-related invoices.

(8) Monitoring and Verification of Energy Usage.

(a) All offset project documentation, including the consistency application and monitoring and verification reports, shall be signed by a professional engineer, identified by license number. Monitoring and verification of energy usage shall be demonstrated through a documented process consistent with the protocols and procedures, as applicable, of this regulation.

(b) For existing commercial buildings, determination of baseline energy usage shall be consistent with the International Performance Measurement & Verification Protocol, Volume I: Concepts and Options for Determining Energy and Water Savings, DOE/IGO-102002-1554, Chapter 3, "Option B: Retrofit Isolation" and "Option D: Calibrated Simulation." If a building project involves only energy conservation measures implemented as part of a CO_2 emissions offset project, a process consistent with International Performance Measurement & Verification Protocol, Volume I: Concepts and Options for Determining Energy and Water Savings, DOE/IGO-102002-1554, Chapter 3, "Option C: Whole Building", may be used, as applicable. Application of the IPMVP general guidance shall be consistent with the applicable detailed specifications in ASHRAE Guideline 14-2002: Measurement of Energy and Demand Savings.

(c) For new commercial buildings, determination of baseline energy usage shall be consistent with the International Performance Measurement & Verification Protocol (IPMVP): Concepts and Practices for Determining Energy Savings in New Construction, Volume III, Part I, Chapter 4, "Option D: Whole Building Calibrated Simulation," EVO 30000-1: 2006. Application of the IPMVP general guidance shall be consistent with the applicable detailed specifications in ASHRAE Guideline 14-2002: Measurement of Energy and Demand Savings.

(d) For existing and new residential buildings, determination of baseline energy usage shall be consistent with the requirements of the RESNET 2006 Mortgage Industry National Home Energy Rating Systems Standards, "Chapter Three: National Energy Rating Technical Standards," and "Appendix A: National Home Energy Rating Technical Guidelines, On-Site Inspection Procedures for Minimum Rated Features".

(9) Isolation of Applicable Energy Conservation Measure.

(a) In calculating both baseline energy usage and energy savings, the project sponsor shall isolate the impact of each eligible energy conservation measure (ECM), either through direct metering or energy simulation modeling.

(b) For offset projects with multiple ECMs, and where individual ECMs can affect the performance of others, the sum of energy savings due to individual ECMs shall be adjusted to account for the interaction of ECMs.

(c) For commercial buildings, this process shall be consistent with the requirements of ASHRAE Guideline 14-2002: Measurement of Energy and Demand Savings, and ANSI/ASHRAE/IESNA Standard 90.1-2007: Energy Standard for Buildings Except Low-Rise Residential Buildings.

(d) For residential buildings, this process shall be consistent with the requirements of RESNET 2006 Mortgage Industry National Home Energy Rating Systems Standards, "Chapter Three: National Energy Rating Technical Standards," and "Appendix A: National Home Energy Rating Technical Guidelines, On-Site Inspection Procedures for Minimum Rated Features".

(e) Reductions in energy usage due to the energy conservation measure shall be based upon actual energy usage data.

(f) Energy simulation modeling shall only be used to determine the relative percentage contribution to total fuel usage for each respective fuel type of the application targeted by the energy conservation measure.

(10) Calculation of Energy Savings. Annual energy savings are determined as follows:

$$\text{Energy Savings (MMBtu)} = (\text{BEU}_{\text{AECM}} \times A) - (\text{PIEU}_{\text{ECM}} \times A)$$

where:

(a) BEU_{AECM} = Annual pre-installation baseline energy use by fuel type (MMBtu) attributable to the application or applications to be targeted by the energy conservation measure or measures, based upon annual fuel usage data for the most recent calendar year for which data is available. For new buildings, baseline energy use for a reference building equivalent in basic configuration, orientation, and location to the building in which the eligible energy conservation measure or measures is implemented shall be determined according to ASHRAE Guideline 14-2002: Measurement of Energy and Demand Savings and ANSI/ASHRAE/IESNA Standard 90.1-2007, Section 11 and Appendix G. Where energy simulation modeling is used to evaluate an existing building, modeling shall be conducted in accordance with ASHRAE Guideline 14-2002: Measurement of Energy and Demand Savings, and ANSI/ASHRAE/IESNA Standard 90.1-2007, Section 11 and Appendix G. For existing and new residential buildings, energy simulation modeling shall be conducted in accordance with the requirements of RESNET 2006 Mortgage Industry National Home Energy Rating Systems Standards, "Chapter Three: National Energy Rating Technical Standards," and "Appendix A: National Home Energy Rating Technical Guidelines, On-Site Inspection Procedures for Minimum Rated Features".

(b) PIEU_{ECM} = Annual post-installation energy use by fuel type (MMBtu) attributable to the energy conservation measure, to be verified based on annual energy usage after installation of the energy conservation measure or measures, consistent with the requirements of ASHRAE Guideline 14-2002: Measurement of Energy and Demand Savings. Where energy simulation modeling is used to evaluate a new or existing building, modeling shall be conducted in accordance with ASHRAE Guideline 14-2002: Measurement of Energy and Demand Savings, and ANSI/ASHRAE/IESNA Standard 90.1-2007, Section 11 and Appendix G. For existing and new residential buildings, energy simulation modeling shall be consistent with the requirements of RESNET 2006 Mortgage Industry National Home Energy Rating Systems Standards, "Chapter Three: National Energy Rating Technical Standards," and "Appendix A: National Home Energy Rating Technical Guidelines, On-Site Inspection Procedures for Minimum Rated Features".

(c) A = Adjustments to account for any differing conditions during the two time periods (pre-installation and post-installation), such as weather (weather normalized energy usage based on heating and cooling degree days), building occupancy, and changes in building use or function. For commercial buildings, adjustments shall be consistent with the specifications of ASHRAE Guideline 14-2002: Measurement of Energy and Demand Savings, and ANSI/ASHRAE/IESNA Standard 90.1-2007, Section 11 and Appendix G. For residential buildings, adjustments shall be consistent with the specifications of RESNET 2006 Mortgage Industry National Home Energy Rating Systems Standards, "Chapter Three: National Energy Rating Technical Standards," and "Appendix A: National Home Energy Rating Technical Guidelines, On-Site Inspection Procedures for Minimum Rated Features".

(11) Provision for Sampling of Multiple Similar Offset Projects in Residential Buildings. Offset projects that implement similar measures in multiple residential buildings may employ representative sampling of buildings to determine aggregate baseline energy usage and energy savings. Sampling protocols shall employ sound statistical methods such that there is 95 percent confidence that the reported value is within 10 percent of the true mean. Any sampling plan shall be certified by an independent accredited verifier.]

[.07].05 Avoided Methane Emissions from Agricultural Manure Management Operations.

A. — F. (text unchanged)

G. Emissions Baseline Determination.

(1) (text unchanged)

(2) Baseline CH_4 emissions shall be calculated as follows:

$$[\text{CO}_2\text{e (tons)}] Eb = (V_m \times M) / 2000 \times \text{GWP}$$

where:

(a) $[\text{CO}_2\text{e}] Eb$ = Potential CO_2e emissions due to calculated CH_4 production under site-specific anaerobic storage and weather conditions (tons);

(b) V_m = Volume of CH_4 , in cubic feet, produced each month from [degradation] *decomposition* of volatile solids in a baseline uncontrolled anaerobic storage scenario under site-specific storage and weather conditions for the facility at which the manure or organic food waste is generated;

(c) (text unchanged)

(d) $\text{GWP} = [23] 28$ for the global warming potential of CH_4 .

(3) The estimated amount of volatile solids [degraded] *decomposed* each month under the uncontrolled anaerobic storage baseline scenario shall be calculated as follows:

$$\text{VS}_{\text{deg}} = \text{VS}_{\text{avail}} \times f$$

where:

(a) (text unchanged)

(b) VS_{avail} = Volatile solids available for [degradation] *decomposition* in manure or organic food waste storage each month as determined from the equation:

$$VS_{avail} = VS_p + 1/2 VS_{in} - VS_{out}$$

where:

(i) (text unchanged)

(ii) VS_{in} = Volatile solids added to manure or organic food waste storage during the course of the month, in kilograms; the factor of 1/2 is multiplied by this number to represent the average mass of volatile solids available for [degradation] *decomposition* for the entire duration of the month;

(iii) (text unchanged)

(c) (text unchanged)

(4) The volume of CH_4 produced, in cubic feet, from [degradation] *decomposition* of volatile solids shall be calculated as follows:

$$V_m = [(VS_{deg} \times B_o)] (VS_{dec} \times B_o) \times 35.3147$$

where:

(a) (text unchanged)

(b) $[VS_{deg}] VS_{dec}$ = volatile solids [degraded] *decomposed*.

(c) B_o = Manure or organic food waste type-specific maximum methane generation constant [$m^3 CH_4/kg$ VS degraded] ($m^3 CH_4/kg$ VS *decomposed*). For dairy cow manure, $B_o = 0.24 m^3 CH_4/kg$ VS [degraded] *decomposed*. The methane generation constant for other types of manure shall be those cited at U.S. EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks [, 1990—2007, EPA 430-R-09-004, Annex 3.10, A-170: "Waste Characteristics Data"] : 1990-2010, Annex 3, Table A-180, April 15, 2012, unless the project sponsor proposes an alternate methane generation constant *and the alternate is approved by the Department*. If the project sponsor proposes to use a methane generation constant other than the ones found in the above-cited reference, the project sponsor shall provide justification and documentation to the Department.

H. Calculating Emissions Reductions.

(1) Emissions reductions shall be [determined based on the potential emissions in tons of CO_2e of the CH_4 that would have been produced in the absence of the offset project under a baseline scenario that represents uncontrolled anaerobic storage conditions and releasing directly to the atmosphere.] *calculated as follows:*

$$ERt = EB - Ep$$

where:

(a) ERt = CO_2e emissions reductions due to project activities;

(b) EB = Potential CO_2e emissions due to calculated CH_4 production under site-specific anaerobic storage and weather conditions (tons); and

(c) Ep = CO_2e emissions due to project activities additional to baseline (tons), including, but not limited to manure transportation, flaring, venting, and effluent management.

(2) Emissions reductions may not exceed the potential emissions of the anaerobic digester, as represented by the annual volume of CH_4 produced by the anaerobic digester. [If the project is a regional-type digester,] CO_2 emissions due to transportation of manure and organic food waste from the site where the manure and organic food waste was generated to the anaerobic digester shall be subtracted from the calculated emissions reduction.

(3) — (5) (text unchanged)

I. Monitoring and Verification Requirements.

(1) — (5) (text unchanged)

[(6) The project sponsor shall verify biogas CH_4 composition quarterly through gas sampling and third-party laboratory analysis using applicable U.S. EPA test methods described in §I(7) of this regulation.]

[(7)] (6) Input Monitoring Requirements.

Input Parameter	Measurement Unit	Frequency of Sampling	Sampling Method(s)
Influent flow (mass) into the digester	Kilograms (kg) per month (wet weight)	Monthly total into the digester	(a) Average herd population and American Society of Agricultural and Biological Engineers ASABE D384.2, Manure Production and Characteristics; (b) Digester influent pump flow; (c) Recorded weight
Influent total solids concentration (TS)	Percent (of sample)	Monthly, depending upon recorded variations	USGS, Methods for the Determination of Inorganic Substances in Water and Fluvial Sediments, Techniques of Water-Resources Investigations of the United States Geological Survey, Book 5, Chapter A1, Method Number I-3750, "Solids, residue on evaporation at 105 degrees C,

Influent volatile solids (VS) content of manure	Percent (of TS)	Monthly, depending upon recorded variations	total, gravimetric" U.S. EPA, Methods for the Chemical Analysis of Water and Wastes (MCAWW) (EPA/600/4-79/020), Method Number 160.4, "Volatile Residue by Muffle Furnace"
Average monthly ambient temperature	Temperature °C	Monthly (based on farm averages)	Closest National Weather Service-certified weather station

[.08].06 — [.09].07 (text unchanged).

Title 26 DEPARTMENT OF THE ENVIRONMENT

Subtitle 09 MARYLAND CO₂ BUDGET TRADING PROGRAM

Chapter 04 Auctions

Authority: Environment Article, §§1-101, 1-404, 2-103, and 2-1002(g), Annotated Code of Maryland

.01 — .05 (text unchanged).

.06 Auction of CO₂ Allowances.

A. (text unchanged)

B. General Requirements.

(1) The Department shall include the following information in the auction notice for each auction:

(a) — (b) (text unchanged)

(c) The minimum reserve price for the auction; [and]

(d) The CCR trigger price for the auction [.] ;

(e) The maximum number of CO₂ allowances that may be withheld from sale at the auction if the condition of §B(4)(a) of this regulation is met; and

(f) The ECR trigger price for the auction.

(2) — (3) (text unchanged)

(4) *The Department or its agent shall follow these rules for the withholding of CO₂ ECR allowances from an auction:*

(a) CO₂ ECR allowances shall only be withheld from an auction if the demand for allowances would result in an auction clearing price that is less than the ECR trigger price prior to the withholding from the auction of any ECR allowances;

(b) If the condition in §B(4)(a) of this regulation is met at an auction, then the maximum number of CO₂ ECR allowances that may be withheld from that auction will be equal to the quantity described in COMAR 26.09.02.03D(1) minus the total quantity of CO₂ ECR allowances that have been withheld from any prior auction in that calendar year; and

(c) Any CO₂ ECR allowances withheld from an auction will be transferred into the Emission containment reserve account.

.07 — .14 (text unchanged)