

REVIEW OF VM0008

Methodology Element Title	Methodology for Weatherization of Single Family and Multi-Family Buildings	
Version	1.0	
Methodology Element Category	Methodology	x
	Methodology Revision	
	Module	
	Tool	
Sectoral Scope(s)	3. Energy demand	

Report Title	Review of VM0008
Assessment Criteria	VCS Standard, v3.3; Methodology Approval Process, v3.4
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Prepared By	Sam Hoffer, Program Officer, VCS
Contact	shoffer@v-c-s.org

Summary:
<p>The VCS Association released a comprehensive set of requirements for standardized methods on 1 February 2012. As VM0008 utilizes a performance method as part of its approach to additionality, this review was performed to determine whether VM0008 complied with the new requirements.</p> <p>This review revealed that VM0008 required several clarifications/minor edits in order to become compliant with the VCS requirements for standardized methods. As such, the methodology was updated following the streamlined procedures described in section 8.3.2 of the <i>Methodology Approval Process, v3.4</i>.</p>

1 ASSESSMENT FINDINGS

The findings below are categorized by methodological component. Each non-conformity or required clarification identifies the VCS rule against which the finding was made, the methodology’s approach to the rule and, where practicable, a potential solution to the finding.

1.1 General Requirements

(1) Section 4.1.9 of the *VCS Standard* requires methodologies to specify which type of method (i.e. standardized or project method) is used to determine additionality. VM0008 does not specify this and is therefore required to do so. As VM0008 is required to use the latest version of the *VCS Methodology Template* as part of this update, however, this finding will be closed by virtue of using the abovementioned template.

Developer Response: The methodology is reformatted using the latest version of the *VCS Methodology Template*. The methodology clarifies that, in order to determine additionality, the performance method is applied to categories A, B, and C and that the project method is applied to category D.

VCSA Response: The developer response adequately addresses the finding. No further action is required.

(2) Section 4.1.12 of the *VCS Standard* requires methodologies to “include sufficient information and evidence to allow the reader to reach the same assessment conclusion on the appropriateness and rigor of the standardized method reached by the two validation/verification bodies in the methodology approval process, noting that the confidentiality of proprietary data may be protected as set out in Section 4.5.6(5). To aid the readability and clarity of methodologies, such information and evidence may be included in appendices to methodology documents rather than in the body of the documents themselves.” VM0008 contains little language with regard to the above requirement, and is therefore required to draft language with respect to same.

Developer Response: The following language will be included in the methodology Section 7.

The level of the performance benchmark established using the performance method is based on the rigorous requirement that with 90% certainty, dwellings deemed additional under the methodology would not have reached the improvement in energy efficiency on their own. This is evidenced by performance data of dwellings from the Same Building Stock as defined in the methodology. The methodology formulates a universally applicable approach. The actual value of the performance benchmark (i.e., the 90th percentile of percentage improvement in energy efficiency over the 3 most recent years) then has to be calculated for the specific project area where the methodology is applied. Hence, the same rigour applies wherever the methodology is used. Example case data from the US shows that only a tiny fraction of houses have undergone weatherization in recent years and that on average, energy use is still on the rise, making

substantial energy efficiency improvements not a likely occurrence on their own.

The choice of 90% as confidence level for the performance method aligns with or exceeds similar requirements set forth in guidance pertaining to the CDM:

- *The Marrakech Accords of the UNFCCC foresee three optional approaches to additionality of CDM projects of which one consists in the formulation of a benchmark. Article 48 (c) defines the benchmark as “The average emissions of similar project activities undertaken in the previous five years in similar social, economic, environmental and technological circumstances, and whose performance is among the top 20 per cent of their category”. The proposed top 10 percent in VM0008 is a more conservative approach.*
- *VM0008 provides for significant rigour in applying the performance method, far exceeding previous cases of methodologies that were not accepted. For example, a new CDM methodology, 302 “CDM methodology for cement and clinker production facilities based on benchmarking”, was proposed using the top 20 percent performing installations as a performance benchmark for additionality. This methodology has not been accepted by the CDM EB (at time of writing), on several grounds. We chose to be far more stringent in VM0008.*

VCSA Response: The developer response adequately addresses the finding. No further action is required.

(3) Section 4.1.13 of the *VCS Standard* requires methodologies using a performance method to be prepared using the latest version of the *VCS Methodology Template*. Therefore, as part of this update, VM0008 is required to use the latest version of the *VCS Methodology Template*.

Developer Response: The methodology is reformatted using the latest version of the VCS Methodology Template.

VCSA Response: The developer response adequately addresses the finding. No further action is required.

(4) Section 4.1.16 of the *VCS Standard* requires methodologies using a performance method to define the performance benchmark metric “in terms of tonnes of CO₂e per unit of output...or input”, or a proxy metric may be used. VM0008 defines the performance benchmark for Category A and B projects appropriately as a proxy metric. However, the performance benchmark for Category C projects is not defined in terms of an acceptable metric, but may be appropriately defined as kWh/appliance.

Developer Response: The performance benchmark metric for Category C has been redefined as kWh/appliance.

VCSA Response: The developer response adequately addresses the finding. No further action is required.

(5) Section 4.1.17(1) of the *VCS Standard* requires methodologies to provide “a description and analysis of the current distribution of performance within the sector as such performance relates to the applicability of the methodology or each performance benchmark.” VM0008 contains no such dialogue and is therefore required to draft language with respect to same.

Developer Response:

The following language will be added to Section 7 of the methodology:

There is an abundance of data showing that energy use in existing U.S. buildings is inefficient and increasing over time, and that there are significant barriers to increased penetration of energy efficiency measures. Studies show that the trends in energy use and efficiency are largely similar across the world, although there are some programs (e.g., the United Kingdom Green Deal under the Energy Act of 2011) which target economy-wide energy efficiency program implementation on a large scale.

It is important to note that the level of the performance benchmark is dictated by the performance in a particular geographic area as defined by the Same Building Stock. Therefore, even though there may be programs in different geographic areas that promote residential energy efficiency measures, projects in those locations would still need to exceed the locally applicable performance benchmark.

By extension, in geographic locations where programs exist to promote energy efficiency measures, the performance benchmark can be expected to represent a level of savings that is more stringent than in locations where no such programs exist. The performance method is designed to ensure that the level of the performance benchmark automatically becomes more stringent in geographic locations with increasing levels of residential energy efficiency activities.

The following status quo description for residential buildings in the US serves solely to provide examples of relevant data for the establishment of a Same Building Stock and its particular performance benchmark. The following example case information does not limit the applicability of the performance method to the US. Each performance benchmark must be calculated relative to

each Same Building Stock and its particular geographical boundary.

Relative to the US, studies show:

- In 2005, the U.S. housing stock was found to be comprised of dwellings classified by household type as follows: single family (71.7%), multi-family (22.0%) and mobile homes (6.2%). (DOE Building Energy Data Book 2010, Table 2.2.2)
- In 2005, the following average energy intensities were found in each building stock: single family, 106.6 million Btu per household; multi-family, 64.1 million Btu per household; mobile homes, 70.4 million Btu per household. (DOE Building Energy Data Book 2010, Table 2.1.11)
- In 2008, the breakdown in energy use in U.S. residential buildings was approximately: Natural Gas, 35%; Petroleum, 6%, Coal, 35%, Renewables, 8%; and Nuclear, 14%. Projected values are not expected to vary by more than +/- 5% from 2008 to 2035. (DOE Building Energy Data Book 2010, Table 2.1.2)
- There are “significant and persistent barriers” to implementing energy efficiency measures in the U.S. including structural, behavioral, and availability barriers. (McKinsey 2009)
- Rates of U.S. residential energy efficiency program penetration range broadly from 16% to 0.5% or less (American Council for an Energy Efficiency Economy, 2011). On average, less than 5% of homes in the U.S. have undergone an energy-efficiency retrofit. (Gigaton Throwdown 2009)
- Residential sector energy use is projected to increase at 0.4% per year under a business-as-usual scenario between 2008 and 2020. (McKinsey 2009)
- A typical residence uses up to 40% more energy than it needs to operate economically. (Gigaton Throwdown 2009)
- Worldwide residential energy use increased 19% between 1990 and 2005. (International Energy Agency 2008)
- Only weatherization measures that systematically address the thermal envelope or significantly improve the efficiency of end-use appliances are likely to enable a project to exceed a performance benchmark;
 - Evaluations of physical weatherization measures in residential dwellings demonstrate savings of around 20-30%. See, for example: Oak Ridge National Laboratories, ORNL/CON-493, 2005; and Cadmus Group, Efficiency Maine Trust Home Energy Savings Program Final Evaluation Report, 2011.
 - By comparison, evaluations of behavior change programs (e.g., providing information to encourage occupants to turn off unneeded lighting and equipment) demonstrate levels of energy savings ranging from levels not statistically different than 0 to energy savings levels of up to about 3%. See, for example: Navigant, Evaluation Report: OPOWER SMUD Pilot Year 2, 2011; and Energy Center of Wisconsin, Focus on Power-PowerCost Monitor Study, 2010.

VCSA Response: The developer response adequately addresses the finding. No further action is required.

(6) Section 4.1.17(2) of the VCS Standard requires methodologies using a performance method to “discuss and evaluate the tradeoff between false negatives and false positives.” VM0008 contains no such dialogue and is therefore required to draft language with respect to same.

Developer Response:

The following language will be added to Section 7 of the methodology:

The level of the performance benchmark was determined after careful consideration of the tradeoff between false negatives and false positives.

False negatives, in the context of the methodology, are dwellings that have been excluded by the performance method (found not to be additional) even though the efficiency upgrades to these dwellings would not have occurred in the absence of the Project. False positives are dwellings that are included in the project even though their efficiency upgrades would have happened anyway. The latter can be considered free-riders.

In elaborating the performance method, the team originally intended to develop a performance benchmark value for efficiency that dwellings would have to attain in order to be considered additional, in the form kWh / m2 or a comparable metric. This metric however was shown to create a risk of producing an unacceptable number of false negatives. During stakeholder consultations, Joel Eisenberg, Weatherization Evaluation Consultant for the U.S. Department of Energy acting as Program Manager at Oak Ridge National Laboratory, pointed out that weatherization efforts directed at low income houses typically target the most energy inefficient houses. While the impact of weatherization is large, both in terms of energy savings compared to the baseline and in social impact, these dwellings are unlikely to meet a high energy efficiency standard even after weatherization. To avoid unnecessary and inappropriate disqualification of low income dwellings, the decision was made to elaborate the performance method based on a percentage change rather than an absolute performance level.

In setting the performance benchmark, the 90th percentile was deemed a sufficiently rigorous requirement for exclusion of free-riders. If the performance benchmark were to be established using a higher level, e.g. 95% or even 99%, there would be a significant risk that the level of energy efficiency enhancement to be exceeded by dwellings in the Project would be determined by singular and random occurrences rather than a systematic trend in the population. For instance, there are households which undertake energy efficiency improvements based on personal environmental consciousness, or because residents are particularly handy and can do the work themselves, or because houses are so drafty that air sealing is necessary to improve living comfort. Special cases with high energy efficiency gains are not and should not be considered the norm. To consider these the norm would lead to the perverse result of disqualifying many weatherization projects.

In choosing a benchmark value of 90% that is more rigorous than comparable CDM guidance yet does not allow for rare occurrences to set the performance benchmark, and by focusing on percentage changes in efficiency enhancements rather than absolute levels of efficiency, VM0008 seeks to minimize and optimally balance the tradeoff between false positives and false negatives.

VCSA Response: The developer response adequately addresses the finding. No further action is required.

1.2 Applicability Conditions

<p>(7) Section 4.3.2 of the <i>VCS Standard</i> requires methodologies using a performance method to develop applicability conditions that “cause to be excluded from the methodology, to the extent possible, those classes of project activities that it can be reasonably assumed will be implemented without the intervention created by the carbon market” and “the methodology shall demonstrate how the applicability conditions achieve such objective with respect to free-riders”. VM0008 contains no such dialogue and is therefore required to draft language with respect to same.</p>
<p>Developer Response: The following applicability condition will be added to Section 4.1 of the methodology:</p> <p><i>The Dwelling must meet or exceed the performance benchmark as calculated for the Same Building Stock. As evidenced by data, dwellings exceeding this performance benchmark would, with 90% certainty, not have happened without the intervention created by the Project.</i></p>
<p>VCSA Response: The developer response adequately addresses the finding. No further action is required.</p>

<p>(8) Section 4.3.5 of the <i>VCS Standard</i> requires methodologies using a performance method to develop applicability conditions that “establish the scope of validity of the methodology...including the geographic scope.” VM0008 does not specify the scope of the performance benchmark, and is therefore required to clarify such.</p>
<p>Developer Response: We propose adding the following applicability condition to Section 4: Applicability Conditions in the methodology, as sub-bullet 4.5:</p> <p><i>The methodology may be applied in any geographic region, provided appropriate data exist to establish the level of the performance benchmark for the Same Building Stock of a Project's geographic region.</i></p> <p>In addition, we propose adding the following clarification to Section 7 of the methodology:</p> <p><i>When using a performance benchmark for Category A, Category B, or Category C activities, project proponents shall calculate the performance benchmark for each Same Building Stock identified in the project description. While the methodology does not set out a geographic limitation on project location, this requirement restricts each performance benchmark to a specific geographic area defined in a project description, e.g., a state, province or region.</i></p> <p>Discussion: The project proponent will be responsible for setting the performance benchmark for each Same Building Stock. A Same Building Stock is defined in part by geographic boundaries. By extension, the project proponent will be responsible for establishing the geographic scope of the performance benchmark.</p>
<p>VCSA Response: The developer response adequately addresses the finding. No further action is required.</p>

<p>(9) Section 4.3.6 of the <i>VCS Standard</i> requires the applicability of methodologies using a performance method to be “limited to the geographic area for which data are available.” VM0008 does not set any geographic parameters on the methodology, and is therefore required to clarify such.</p>
<p>Developer Response: See the response to clarification (8), above.</p>
<p>VCSA Response: The developer response adequately addresses the finding. No further action is required.</p>

1.3 Project Boundary

No findings.

1.4 Procedure for Determining the Baseline Scenario

(10) Section 4.5.6 of the *VCS Standard* requires methodologies using a performance method to utilize appropriate data sources for developing their performance benchmarks. VM0008's performance benchmark is not based on any particular data source, although the project proponent will be required to utilize data sources in order to establish the 90th percentile of performance. VM0008 is therefore required to clarify that project proponents must meet Section 4.5.6 when selecting their data source for establishing the 90th percentile of performance.

Developer Response: We propose the following language be added to Section 7.3, "Data Selection and Use".

In developing a performance benchmark, project proponents must select and use data sources that meet the following requirements of Section 4.5.6 of the VCS Standard Version 3.3 as modified for the methodology:

- 1) Data collected directly from primary sources shall comply with relevant and appropriate standards, where available, for data collection and analysis, and be audited at an appropriate frequency by an appropriately qualified, independent organization.*
- 2) Data collected from secondary sources shall be available from a recognized, credible source and must be reviewed for publication by an appropriately qualified, independent organization or appropriate peer review group, or be published by a government agency.*
- 3) Where sampling is applied in data collection, the project proponent shall demonstrate that sampling results provide an unbiased and reliable estimate of the true mean value (i.e., the sampling does not systematically underestimate or overestimate the true mean value). Project proponents may choose to demonstrate the appropriateness of sampling results based on a qualitative description of data sources and methods, where appropriate.*
- 4) Data shall be publicly available, where appropriate (not confidential). Proprietary data (e.g., data pertaining to individual facilities) may be aggregated, and therefore not made individually publicly available, as there are demonstrable confidentiality considerations. However, sufficient data shall be publicly available to provide transparency and credibility to the dataset.*
- 5) All data shall be made available, under appropriate confidentiality agreements as necessary, to the VCSA and each of the validation/verification bodies assessing the proposed performance benchmark, to allow them to reproduce the determination of the performance benchmark. Data shall be presented in a manner that enables them to independently assess the presented data.*
- 6) All reasonable efforts shall be undertaken to collect sufficient data and the use of expert judgment as a substitute for data shall only be permitted where it can be demonstrated that there is a paucity of data. Expert judgment may be applied in interpreting data. Where expert judgment is used, good practice methods for eliciting expert judgment shall be used (e.g., IPCC 2006 Guidelines for National GHG Inventories).*
- 7) Where data must be maintained in a central repository on an on-going basis (e.g., in a database that holds sector data for use by project proponents in establishing specific performance benchmarks for their projects), there shall be clear and robust custody arrangements for the data and defined roles and responsibilities with respect to the central repository.*

MaineHousing justifies the following modifications to 4.5.6:

- Deletion of bullet “3”: the methodology clearly defines the temporal range of performance benchmark data collection
- Modification of bullet “4”: to remove reference to “methodology developer,” as language in methodology applies only to the project proponent; to clarify that project proponent may choose to demonstrate the appropriateness of sampling results using qualitative descriptions
- Modification of bullet “5”: to clarify that dwelling-specific data need not be disclosed if confidential
- Modification of bullet “6”: to remove the word “methodology,” as language in the methodology applies only to the project proponent
- Deletion of bullet “7”: the methodology specifies that a performance benchmark must be developed relative to the appropriate Same Building Stock and geographic scope of project activities

VCSA Response: The developer response adequately addresses the finding. No further action is required.

(11) Section 4.5.7 of the *VCS Standard* requires methodologies using a performance method to document its dataset within the methodology documentation or in a separate repository. VM0008 is not based on any particular dataset, although the project proponent will be required to document the data used to establish the 90th percentile of performance. VM0008 is therefore required to clarify that project proponents must meet with Section 4.5.7 by either documenting the dataset used to establish the 90th percentile of performance in the project description or in a separate repository (such that a VVB could confirm the dataset’s conformance with the requirements of Section 4.5.6 of the *VCS Standard*).

Developer Response: We propose the following language be added to Section 7.3, “Data Maintenance”.

Project proponents must maintain data used to establish any performance benchmark in a manner that meets the following requirements of Section 4.5.7 of the VCS Standard version 3.3 as modified for the methodology:

The dataset may be documented and contained within the project description, or may be maintained in a separate repository that is referenced by the project description. Datasets documented and contained within the project description are static datasets, where all project activities use the level of the relevant performance benchmark that is specified in the project

description. The following applies with respect to datasets maintained in a separate repository:

- 1) The dataset may be static or dynamic (ie, may or may not be periodically updated).*
- 2) The project description shall establish criteria and procedures for the use of the dataset and for establishing a specific performance benchmark for each Same Building Stock*
- 3) The project description may specify that projects use the level of the performance benchmark metric available at project validation for the duration of their project crediting periods, or may specify that projects use an updated level of the performance benchmark at each verification event. The frequency that data is updated within the dataset shall be determined by the project proponent.*
- 4) It shall be demonstrated that procedures are in place to maintain the dataset in accordance with the applicable requirements set out in Section 7.3, "Data Selection and Use".*

VCSA Response: The developer response adequately addresses the finding. No further action is required.

1.5 Procedure for Demonstrating Additionality

No findings.

1.6 Baseline Emissions

No findings.

1.7 Project Emissions

No findings.

1.8 Leakage

No findings.

1.9 Quantification of Net GHG Emission Reductions and/or Removals

No findings.

1.10 Monitoring

No findings.

1.11 Data and Parameters

No findings.

1.12 Use of Tools/Modules

No findings.

2 ASSESSMENT CONCLUSION

The developer has provided sufficient responses to close all findings.