SUMMARY OF PUBLIC CONSULTATION

VM0008 Weatherization of Single Family and Multi-Family Buildings, v1.2

A draft of the proposed minor revision to *VM0008 Weatherization of Single Family and Multi-Family Buildings, v1.1*, was open for public consultation between December 12, 2024 and January 13, 2025. This document includes a list of all comments received and the developer's response.

GENERAL FEEDBACK

General Feedback

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1	Climate Neutral Business Network (CNBN)	Climate Neutral Business Network (CNBN) has assisted clients in conducting and providing input to shape the Minor Revision of VM0008 vs 1.2. The revision enables heat pump technologies (air source, geothermal and heat pump water heaters) to seek VCU issuance on a deemed savings basis, using VM0008's Category C approach, provided the deemed savings calculations are made on a credible conservative basis. The revisions arose as a result of input from many entities over the last five years including leading real estate development companies, utilities, energy efficiency non-profits, energy infrastructure and service companies,	No revisions needed to the methodology.

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		residential integrated network developers, heat pump equipment installers, state government agencies, industry associations, academics, financial institutions and beyond. CNBN is grateful for their reviews and insights into how to most credibly shape and detail these revisions. CNBN is deeply indebted to the leadership provided by Chris Gray of EcoSmart Solution who has spearheaded and funded all this Minor Revision work. These stakeholders' support for this revision is demonstrated by their investment of time and expertise to both help craft the foundations for this methodology revision and review methodology drafts. Representative input to this public comment process from these stakeholders includes the following: We appreciate Verra's increased focus on innovative HP/HPWH technologies' energy efficiency crediting in residential settings which opens up more voluntary carbon market opportunities for geothermal installations whose market penetration levels are extremely small due to substantial market barriers. We appreciate the inclusion of HP HPWH technologies on a more streamlined accessible basis for residential settings and would look forward to VCS at a future date expanding this to further commercial settings.	

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		Streamlining access to crediting for highly decentralized HP/HPWH technologies on a deemed savings basis is essential if the voluntary carbon market is to accelerate market penetration levels for these mission critical technologies. These technologies in residential settings are not typically sub-metered nor are their retrofit baselines. This VM0008 revision therefore represents a vital innovation to expand access for these technologies whose micro-scale renders them ill-suited to VM0008's conventional audit approach.	
2	Anonymous 1	The Performance Method requires acquisition of statistical data suitable for setting the average performance, and the data collection can be difficult depending on the data situation. To facilitate the introduction of heat pumps (HP) and heat pump water heaters (HPWH) and other appliances that consume less energy, we propose to expand the options of additionality certification methods and revise them to allow to describe additionality by the Project Method and Activity Method.	The project method additionality test is hard to apply to such decentralized projects with very small scale instances: this is why VM0008 originally applied the performance curve method to energy efficiency retrofits that are so small scale. An activity method would need to be specified -- but the 5% market share penetration approach wouldn't be feasible since in most markets, HPs have more than a 5% market share. The performance curve is effectively a more advanced market share penetration method, setting the market penetration level at 20% but also requiring that the technology be in the highest efficiency ranking to be eligible. We have found data resources suitable for the performance curve analysis in the US. Note: A different approach for additionality may be proposed by submitting a Methodology Idea Note per the Methodology Development and Review Process.
3	Anonymous 1	For category C, performance Method certifies that the replacement equipment' energy consumption is in the bottom 20%.	The methodology requires modelling at the site level in order to establish the retrofit baseline. So one cannot establish the baseline at a country level (aka 80% market share for boilers to set baseline to boilers for the project).

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		In the following case, can additionality be proven as follows? 【Case】 #1 Scope: boilers and heat pumps in CountryX (set baseline to boilers in the project) #2 Share: 80% for boilers and 20% for HP/HPWH (based on statistics of CountryX) #3 Energy consumption: Consumption of the lowest type boilers=200 (from catalogs). Consumption of the highest type of HP/HPWH=200 (from catalogs) 【Proof】 Regarding energy consumption, boilers > HP/HPWH. HP/HPWH's energy consumption is in the bottom 20%. Equipment A is a HP/HPWH (lower level of consumption than other HP/HPWH.) Therefore, equipment A's consumption is in the bottom 20% and it is additional.	Relative to additionality applying the performance curve, the relative market shares and performance efficiencies of all heating/hot water systems in the market need to be tabulated and rank ordered or established on a normal distribution performance curve.
4	Anonymous 1	As for the formula for category C（cf. 8.4, p39), the emission factors before and after implementation are the same. Regarding the installation of HP/HPWH, it is necessary to adopt a calculation formula that can be calculated even if the energy source differs before and after the replacement, so that the replacement from a combustion boiler to a	Because the current formula is summed over fuel types f, it already incorporates energy sources that differ before and after replacement. The intention in the multiplication of EFfCO2 over fuel types f was that it should be applied according to each fuel type f as applicable to each of the components inside the brackets (pre and post replacement). For clarity's sake, we have now defined EFfCO2 as two terms (pre and post) and revised the

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		HP/HPWH can be handled. According to the revised draft, the Deemed Savings Approach assumes that the energy loss before and after the implementation of the project may be different, and our approach to the calculation formula is in the same direction as the revised draft. Emission reduction(t-CO2/year)={pre-implementation energy demand(Btu/hr)*Annual operating hours pre-implementation(hrs/year)*pre-implementation Energy emission factor (t-CO2/Btu) - {post-implementation energy demand(Btu/hr)*Annual operating hours post-implementation(hrs/year)*post-implementation Energy emission factor (t-CO2/Btu)} *Equipment malfunction correction factor - amount of leakage in year y(t-CO2) Additionally, it is assumed that standard value or post-implementation value should be applicable for annual operating hours after implementation so that quantification will be possible even if it is impossible to collect the data of pre-implementation operating hours.	equation accordingly to avoid any confusions. The methodology already includes a note, now made even clearer, to confirm that ElecCO2 applies as the emission factor if the energy source f is electricity, where this is applicable pre or post project activity intervention. (Note: When baseline and project appliances use electricity as their energy source f, Ef,dem,pre,k and Ef,dem,post,k can be supplied in kWh, whereupon EFf,pre/post,CO2 must then be substituted by ElecCO2, (applied appropriately pre and/or post) using the grid emission factor per Equation (7).). The modelling establishes the annual operating hours of the installed equipment (pre and post) based upon its capacity, performance and the hours of operations needed to deliver comparable energy services as those delivered in the baseline consistent with the building's load requirements. That is the pre/post hours of operation are derived from the modeling.
5	Anonymous 1	We believe that not only replacements but also the new installation of HP/HPWH should be included in Category C to promote the use of products with a lower environmental impact in regions where heating is essential.	The scope of VM0008 is focused upon retrofit installations. There are no provisions for baseline scenario development under any category (ABCD) in VM0008 which is what new construction (NC) would require. There are other methodologies which can accommodate energy efficiency

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			projects in new construction (which is what I think is being referenced here by "new installation of HP/HPWH") - including CDM methodologies that use the project method for additionality which Anonymous 1 sought to include in comment 2. Such significant expansion in VM0008's scope should be considered if necessary in a subsequent revision since this would be a major revision to VM0008 impacting all categories. At such a point, further provisions could be developed for establishing a market-based baseline for NC. However, this is not within the scope of this minor revision.
6	Anonymous 2	We think there should be a geographic limitation for the selection of the control and sample groups to ensure comparability. For example, these groups should be limited to a certain area (e.g. within 200 km).	The control and sample groups are applicable to Category A and B. This revision focuses upon the inclusion of HP/HPWH in Category C. Any project seeking to apply control and sample groups will need to justify their selection for the sample and control groups to the VVB and Verra program review team. There are already provisions for this sampling in VM0008 for comparability for example through the "same building stock" requirement. Geographic proximity is already incorporated into the definition of "Same Building Stock" which stipulates that dwellings be "1) in the same state, province, or region". So the control and sample groups are already limited to these certain areas and subject to VVB review regarding their compliance with the same building stock provisions. Undue constraints (e.g. to 200km) would risk reducing the quality of the control and sample groups.
7	Anonymous 2	Has there been any consideration given to the reliability of modeling for heat pumps, particularly in colder regions? In areas with extreme winter temperatures, the coefficient of performance for heat pumps may decrease significantly, potentially limiting cost savings when heating demand is	The Applicability Condition already makes it a requirement that the HP/HPWH modeling take weather variances into account including any extreme winter temperatures. More specific language has been added to make it clear that the modeling's weather adjustments must modify the HP/HPWH system performance levels taking into account the weather conditions for the area at the county level. Specifically

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		highest. Would an audit-based approach provide a more robust assessment in such cases?	these revisions state: When conducting modelling for heat pump / heat pump water heater (HP/HPWH) as appliances (e.g., in Category C), tools such as EnergyPlus, Home Energy Rating System (HERS), utility-grade deemed savings models, utility-grade monitored savings model, or geothermal heat pump OEM models (e.g., Wright Suite) and other industry specific models may be used for establishing HP/HPWH baseline and project energy consumption values provided. a) The model includes weather-normalized adjustments spanning at least a 10-year basis, drawing upon the Typical Meteorological Year (TMY) data at the project location's county level when establishing the modelled baseline emissions and to ensure system performance is calibrated each project year y, the modelling must draw upon local, applicable weather data for project year y when calibrating the modelled project emissions each year. Relative to the coefficient of performance for HPs in colder regions, performance curves, such as those supplied by the DoE which provide default values for the coefficient of performance for HP and HPWH across different climate zones, are applied during the modelling. The Applicability Condition has been revised to make this requirement clear and appropriate references included. When combined with the weather based adjustments in the modelling as described above, a credible crediting basis is established.