Verified Carbon Standard

ACCELERATING THE ADOPTION AND USE OF ELECTRIC VEHICLES

Bridge to Renewables, Inc.

Document Prepared by Carbonomics, LLC

Project Title	*Accelerating the Adoption and Use of Electric Vehicles*
Version	*1*
Date of Issue	*01/02/2023*
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1 PROJECT DETAILS

1.1 Summary Description of the Project

Under this project activity, Bridge to Renewables, Inc. (BTR) will work with electric vehicle manufacturers (EV Original Equipment Manufacturers or EV OEMs) to help accelerate the adoption and optimal use and charging of EVs and, through the collection of accurate and precise data, measure the greenhouse gas (GHG) impact of those EVs' charging relative to an assumed baseline of comparable-model internal combustion engine (ICE) vehicles. Using an existing proprietary technology platform (the BTR Bridge platform), BTR will aggregate EV telematics data from participating EV OEMs to measure miles driven and kilowatt-hours charged and thus GHGs reduced. BTR's technology enables the precise and accurate measurement of the GHG impact because the EV's telematics systems collect data on the location, time, and amount of charging, which BTR then uses to determine the carbon intensity of the relevant grid during each charging event compared to the baseline of a comparable-model ICE vehicle. BTR intends to relay this information back to the EV OEMs and the EVs and thereby inform drivers about the GHG intensity of their charging and encourage them to optimize charging by shifting it to times when the grid is cleanest.

Importantly, BTR's technology allows it to (a) conservatively filter out charging events which occur at EV charging stations that are or could become part of another VM0038 project; and (b) exclude EV charging events which are located in jurisdictions that have existing GHG-reduction programs. For example, BTR will exclude any charging that occurs in California, Washington, or Oregon. This functionality will eliminate the risk of double-counting. This technology also enables charging events to be captured and filtered by charging type – e.g. residential vs public – and across all types of chargers (e.g. L2 and DCFC).

BTR will act as the project proponent for this grouped project and undertake all of the monitoring and data collection required under VM0038. The carbon offsets representing the emissions reductions are generated by the charging data collected by the EV OEMs from the EVs; transfer of the ownership of the offsets is established through contractual terms. During the course of the crediting period, BTR estimates that 2,508,916 tons of CO2 will be reduced or an annual average of 250,892 tCO2. In the absence of this project, fewer EVs would displace the sale and use of ICE vehicles, fewer EV drivers would be informed about the GHG intensity of their charging and, therefore, fewer EV drivers would optimize their charging for GHG reductions.

1.2 Sectoral Scope and Project Type

The Project activity includes EV charging and falls within both Sectoral Scope 2 – Energy distribution, as well as Sectoral Scope 7 – Transport.

1.3 Project Eligibility

The project meets all the criteria set out in the VCS Program Guide, the VCS Standard and the VM0038 methodology approved under the VCS program. The project will help accelerate the adoption and optimal use of EVs and thus involves the displacement of ICE vehicles with EVs.

Section 2.1 of the VCS Standard (v4.2) lays out the scope of the VCS program, including the following:

1) The six Kyoto Protocol GHGs (this project will reduce CO2 as explained in Section 4 of this document)
2) Ozone-depleting substances (not applicable)
3) Project activities supported by a methodology approved under the VCS Program through the methodology approval process (this project will use VM0038 as explained in Section 3 of this document)
4) Project activities supported by a methodology approved under an approved GHG program (not applicable as this is using a Verra methodology)
5) Jurisdictional REDD+ programs and nested REDD+ projects as set out in the VCS Program document Jurisdictional and Nested REDD+ (not applicable)

Section 2.1 of the VCS Standard also outlines a number of excluded project types, such as HFC-23. None of these apply to this particular project activity.

1.4 Project Design

☐ The project includes a single location or installation only

☐ The project includes multiple locations or project activity instances, but is not being developed as a grouped project

☒ The project is a grouped project

Eligibility Criteria

As a grouped project, additional EV OEMs and associated EV charging can be included as new project activity instances as long as these are operating within BTR's program. In addition, new project instances shall meet the following requirements:

1) Meet the applicability conditions set out in VM0038, as outlined in Section 3.2.

2) Use the technologies or measures specified in the project description, specifically the use of BTR's Bridge platform to collect and process information on EV charging events.

3) Apply these technology measures in the same manner as specified in this document.

4) Confirm that the baseline scenario – as specified in VM0038 – is the continuation of conventional, gas-powered vehicles. Compliance with this criterion will also enable the project instance to utilize the same baseline scenario and additionality assessment (positive list) as outlined in Sections 3.4 and 3.5.

5) Be located within the United States and have a start date at the same time or later than the grouped project start date.

6) Be validated at the time of verification against all of the above criteria and be included into the monitoring report with all the necessary information needed to comply with these criteria.

7) Not leave this project and subsequently enroll in another VCS-registered project.

8) Will have evidence of ownership of the project emissions reductions by project proponent.

1.5 Project Proponent

Organization name	Bridge To Renewables, Inc.
Contact person	Russell Dyk
Title	Head of Environmental Products
Address	1 Thomas Circle NW Ste. 700 Washington, DC 20005
Telephone	(917) 708-1364
Email	russ.dyk@btr.energy

1.6 Other Entities Involved in the Project

Organization name	Carbonomics, LLC
Role in the project	Consultant
Contact person	Seth Baruch
Title	President
Address	5077 Blackhawk Drive, Danville, CA 94506
Telephone	202-236-5253
Email	sbaruch@carbonomicsonline.com

1.7 Ownership

For all EV OEMs included within this grouped project, there will be contractual agreements establishing ownership of project Verified Carbon Units (VCUs). An example of such an agreement can be shown to the Validation and Verification Body (VVB) upon project validation. The EV OEMs have terms of service agreements with purchasers of their EVs which provide the EV OEMs the right to use the data collected from the EV telematics for a broad range of purposes including those described in this project.

1.8 Project Start Date

The Project start date is the date when telematics data collection was activated for the initial EV set of the project fleet, in January 2022.

1.9 Project Crediting Period

The project crediting period will run for 10 years from January 1st, 2022 through December 31st, 2031.

1.10 Project Scale and Estimated GHG Emission Reductions or Removals

Project Scale	
Project	X
Large project	

Year	**Estimated GHG emission reductions or removals (tCO_2e)**

2022	382
2023	6,768
2024	22,545
2025	73,431
2026	151,558
2027	260,599
2028	347,203
2029	442,467
2030	547,257
2031	656,708
Total estimated ERs	2,508,916
Total number of crediting years	10
Average annual ERs	250,892

1.11 Description of the Project Activity

By way of background, BTR's mission is to help maximize the environmental benefits of EV adoption. BTR's proprietary Bridge platform enables EV OEMs, charging station networks, and renewable electricity generators to work together to reduce GHG emissions and to participate in Low-Carbon or Clean Fuels programs (CFPs). The Bridge is currently used by a dozen EV OEMs, one of the largest charging station networks in the US, and an array of renewable electricity generators to participate in programs such as California's Low Carbon Fuel Standard.

Under this project activity, BTR will work with EV OEMs to accelerate the adoption and optimal use and charging of EVs and, through the collection of accurate and precise data, measure the GHG impact of those EVs; charging relative to an assumed baseline of comparable-model ICE vehicles.

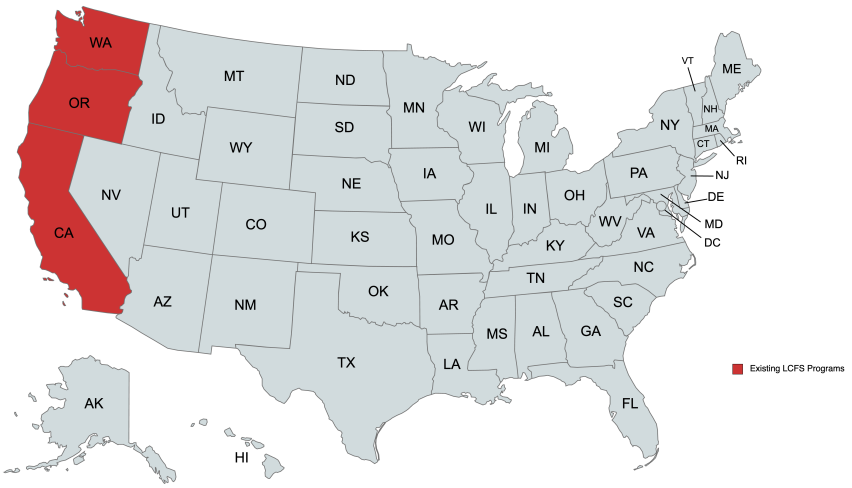
BTR will determine the carbon intensity of the grid during each EV charging event, as well as filter out – through geofencing – any and all charging events located in a geography with a CFP (e.g. California, Washington, Oregon) or that occur at any charging station within the project boundary that is listed on the US Department of Energy's (US DOE) Alternative Fuels Data Center list of EV Chargers. In this way, BTR will ensure that no double counting occurs between

its projects and others that are or may be registered under VM0038 and that the project chargers in its project are closed network L1 or L2 chargers utilized only by the EV owner.

BTR intends to relay the GHG information back to the EV OEMs and, through them, the EVs and thereby inform drivers about the GHG intensity of their charging and encourage them to optimize charging by shifting it to times when the grid is cleanest.

1.12 Project Location

The project boundary for this grouped project will cover the entirety of the United States. However, no charging events in the States of California, Washington, or Oregon will be included as EV charging in those states is assumed to be part of the state CFP. Future programs similar to those may limit eligibility during the crediting period.



1.13 Conditions Prior to Project Initiation

See Section 3.4 (Baseline Scenario)

1.14 Compliance with Laws, Statutes and Other Regulatory Frameworks

The sale and charging of EVs complies will local, state and federal laws as EVs are eligible for sale in all 50 states. Moreover, EV charging systems are not regulated at a federal, state or local level in any of the locations where BTR is claiming VCUs. Thus, this project activity complies with this requirement.

The project proponent will periodically check for updated local and state regulations in order to remain in compliance with all updates to applicable regulations.

1.15 Participation under Other GHG Programs

1.15.1 Projects Registered (or seeking registration) under Other GHG Program(s)

This project has not been registered or is seeking registration under any other GHG program.

1.15.2 Projects Rejected by Other GHG Programs

This project has not been rejected by any other GHG program.

1.16 Other Forms of Credit

1.16.1 Emissions Trading Programs and Other Binding Limits

Does the project reduce GHG emissions from activities that are included in an emissions trading program or any other mechanism that includes GHG allowance trading?

This project does not include EV charging in any states where such charging may be subject to double counting, such as California, Washington, and Oregon. The project is not part of any other emissions trading programs or mechanisms.

☐ Yes ☒ No

1.16.2 Other Forms of Environmental Credit

Has the project sought or received another form of GHG-related credit, including renewable energy certificates?

☐ Yes ☒ No

Supply Chain/Scope 3 Emissions: This project does not require a Scope 3 analysis because the activity does not produce a lower-carbon product for which another party can claim a Scope 3 emission reduction. *Sustainable Development Contributions*

In addition to SDG 13 (Climate Action), this project contributes to the following UN Sustainable Development Goals:

SDG 9. Resilient Infrastructure
Target: 9.4 By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes
Indicator: 9.4.1 CO2 emission per unit of value added (eg: reduction in CO2 emissions per mile traveled)
Monitoring: BTR will have the ability track the Evs within the project boundary, miles travelled, and kWhs dispensed.

SDG 3. Good health and well being
Target 3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.
Indicator 3.9.1 Mortality rate attributed to household and ambient air pollution
Monitoring: Gasoline transport emits large amounts of pollution (Sox, Nox and particulates). For example, the project can track the quantity of PM2.5 and other pollutants not being emitted because of diesel no longer being combusted due to the use of the Evs. This can be done through the use of conversion factors in terms of gallons of gasoline avoided by the Evs, along with amount of pollution emitted per unit of gasoline burned.

1.17 Additional Information Relevant to the Project

Leakage Management

According to VM0038, "Leakage is not considered an issue under this methodology and is therefore set at zero."

Commercially Sensitive Information

Due to commercial confidentiality provisions, the public version of the PD excludes:

1. Commercially sensitive contractual documentation pertaining to the ownership and transfer of the GHG emissions reductions
2. Information about the location of the EV charging included in the project which, due to the residential locations of the charging, could be considered personally identifiable information (e.g. geo-coordinates of homes, etc.)

This information will be made available to the VVB.

Further Information

Not applicable

2 SAFEGUARDS

2.1 No Net Harm

BTR is not aware of any negative environmental or socio-economic impacts associated with this project activity. The project will increase access to and adoption of EVs and the optimization of the associated charging and will help lower the barrier to entry for transportation decarbonization.

2.2 Local Stakeholder Consultation

BTR has engaged several different stakeholder groups in the course of preparing this Project Document, including EV OEMs, EV drivers and potential EV drivers, and entities that support carbon reduction incentives as a means to scale EV adoption.

BTR manages the participation in various CFPs for a dozen major EV OEMs. Over the course of the last twelve months, BTR has engaged in multiple discussions with some of those EV OEMs about participating in a broader set of carbon reduction opportunities, including the precise and accurate measurement of the GHG emissions reductions represented by the adoption of EVs instead of ICE vehicles, and the optimization of EV charging by shifting it to times when the grid is cleaner.

In addition, BTR has designed and tested – including documented online and in person testing with both current EV drivers as well as potential EV drivers – different mediums and methods to effectively communicate information regarding GHG impact to EV drivers and to provide those drivers both behavioural and programmatic means of optimizing EV charging and other driving behaviour to minimize GHG emissions associated with EV charging and use and, therefore, maximize carbon reduction relative to an ICE baseline.

Finally, BTR has engaged with several entities and business networks that support carbon reduction incentives as a means to scale EV adoption, and who have expressed support for this particular application of the methodology and interest in funding such incentives through the purchase of VERs generated by the project.

Additionally, the project listing will undergo a public comment period with Verra. Any comments from local stakeholders received during that period will be addressed and listed in the Public Comments section below.

2.3 Environmental Impact

No environmental impact statement was required for this project activity. Replacement of conventional fossil-fuelled ICE vehicles with EVs improves local air quality and therefore provides a positive impact on human health and the environment.

2.4 Public Comments.

This section will be completed once the 30-day public review period has completed.

3 APPLICATION OF METHODOLOGY

3.1 Title and Reference of Methodology

Methodology for Electric Vehicle Charging Systems, Version 1

3.2 Applicability of Methodology

Provided below are the applicability criteria of VM0038 and this project complies with each:

Applicability Condition	BTR Project
The applicable fleets of projects applying this methodology are limited to all LDV BEVs and PHEVs, and HDV EVs. For LDV projects, these applicable fleets comprise BEVs and PHEVs for L1 and L2 chargers, and BEVs for DCFCs. For HDV projects, these applicable fleets comprise MDV/HDV electric buses and trucks, both BEV and PHEV, eligible to charge at the project's set of EV charging systems.	All EVs under this project will be light-duty PHEVs and BEVs comparable to to conventional fossil fuel baseline ICE vehicles and charging at L1 and L2 "residential" charger locations. MDEV/HDEV and DCFC charging are not included.
Project proponents must demonstrate that the EV models comprising the applicable fleet of the project are comparable to their conventional fossil fuel baseline vehicles using the following means: • Project and baseline vehicles belong to the same vehicle category (e.g., car, motorcycle, bus, truck, LDV, MDV, HDV). • Project and baseline vehicles have comparable passenger/load capacity (comparing the baseline vehicle with the respective project vehicle).	BTR will demonstrate that LDEV models are comparable to baseline ICE vehicles by using vehicle class metrics as presented by the US Environmental Protection Agency (EPA) - eg. compare an EV designated by US EPA as a 2021 Midsize Car to a 2021 ICE Midsize Car, or a 2022 EV Sport Utility Vehicle - 4WD to a 2022 ICE Sport Utility Vehicle - 4WD.
Project and baseline vehicles have comparable passenger/load capacity (comparing the baseline vehicle with the respective project vehicle).	See above

In order to demonstrate that double counting of emission reduction will not occur, the project proponent must maintain an inventory of EV chargers included in the project, including their L1/L2/DCFC classifications and unique identifiers; other measures may include disclosure of credit ownership to EV drivers. Double counting relative to any issued GHG credits from projects that introduce EV fleets will be addressed using the emission reduction discount adjustments in Section 8.4 in VM0038. Where associated infrastructure and/or renewable power (on-site and/or direct transmission) are included in an EV charging system, this must be referenced and described in the charging system's inventory.	All LDEV vehicles included in this project have unique identifiers and all charging events from those vehicles have unique latitudes and longitudes. Using that and other information from the EV telematics, BTR is able to filter out – through geofencing – any and all charging events located in a geography with a CFP (e.g. California, Washington, Oregon) or that occur at any charging station within the project boundary that is listed on the US DOE's Alternative Fuels Data Center list of EV Chargers. In this way, BTR will ensure that no double counting occurs between its projects and others registered under VM0038 and that the project chargers in its project are closed network L1 or L2 chargers utilized only by the EV owner. BTR will conservatively assume that no EV charging systems will have on-site renewables or other associated infrastructure. In reality, very few EV charging systems have renewables and other associated infrastructure, including batteries. This is a conservative approach because an assumption of on-site renewables could overestimate project GHG emissions reductions.
Project documentation must also include the following for each EV charger: *Classification using the performance voltage, AC/DC basis and kw power specifications given for L1, L2 and DCFC 50/100/150/320/500 definitions* *Unique identifiers, including the geo-spatial coordinates and one other unique reference such as*	For this project, each EV will be assigned a unique identifier. Location of the EV will be determined at the time of each charging event and recorded by the telematics system. Actual kWhs dispensed will be recorded by the on-board telematics.

NEMA codes, customer codes, equipment serial numbers, charger ID codes, or AFDC ID codes	
This methodology is applicable to EV charging systems utilizing AI to provide electricity to and from EVs, on-site batteries and renewables under the condition that the AI must include adequate metering systems (e.g., meters/sub-meters and/or associated measurement systems). These metering systems must measure and accurately trace all electricity deliveries and receipts from all such interrelated associated infrastructure sources. This includes electricity sourced from/returned to the grid, dedicated renewable energy generated on-site (including RE sourced from direct transmission lines), on-site storage batteries, and/or the EV's on-board battery.	BTR will conservatively assume that no EV charging systems will have on-site renewables or other associated infrastructure. In reality, very few EV charging systems have renewables and other associated infrastructure, including batteries. This is a conservative approach because an assumption of on-site renewables could overestimate project GHG emissions reductions.
Projects with estimated annual emission reductions of over 60,000 tCO2e (large-scale) are permitted where project proponents can demonstrate that the project is located in a country with credible national data sources for GHG emission calculations.	Projects located in Annex I and II countries, and countries referenced by EIA data sources, are automatically eligible to be of any scale. The US fits into this category and is thus automatically eligible.
Project proponents must demonstrate proof of ownership of emission reductions which may be achieved through the following: • With the charging system owners through contractual agreements, terms of service, utility program participation rules, or other means, and/or • With EV drivers through disclosure of credit ownership (e.g., through dispenser notices, screen displays, terms of service, etc.).	See Section 1.7

3.3 Project Boundary

The project boundary is comprised of the following:

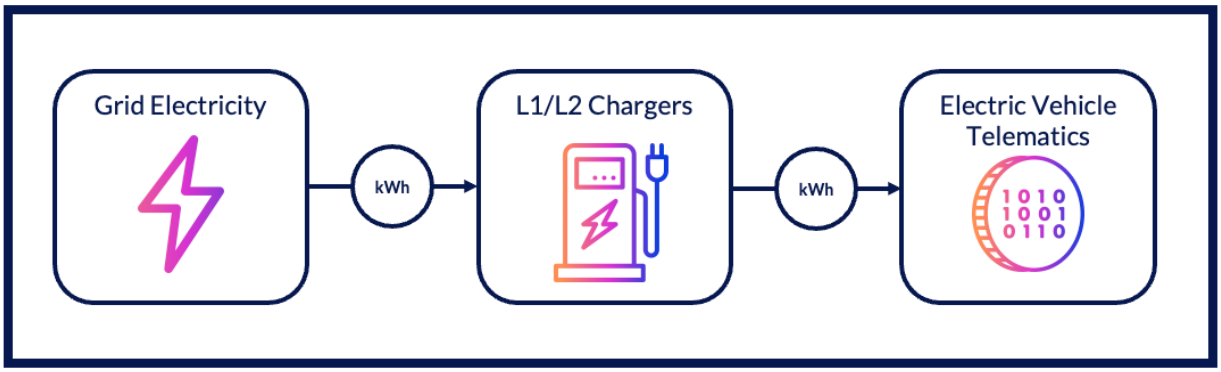
1) The applicable fleets for the project EV chargers;

2) The geographic boundaries where the EV charging systems are located;

3) The EV charging systems of the project activity including their electricity supply sources and associated infrastructure.

Source		Gas	Included?	Justification/Explanation
Baseline	Fossil fuel combustion of vehicles displaced by project activities	CO_2	Yes	Main emission source
		CH_4	No	VM0038 allows exclusion for simplicity
		N_2O	No	VM0038 allows exclusion for simplicity
		Other	No	VM0038 states other GHGs are not applicable
Project	Electricity consumption via grid	CO_2	Yes	Main emission source
		CH_4	No	VM0038 allows exclusion for simplicity
		N_2O	No	VM0038 allows exclusion for simplicity
		Other	No	VM0038 states other GHGs are not applicable
	Renewables via on-site/direct transmission	CO_2	Yes	Main emission source
		CH_4	No	VM0038 allows exclusion for simplicity
		N_2O	No	VM0038 allows exclusion for simplicity
		Other	No	VM0038 states other GHGs are not applicable
	On-site battery storage	CO_2	Yes	Main emission source
		CH_4	No	VM0038 allows exclusion for simplicity
		N_2O	No	VM0038 allows exclusion for simplicity
		Other	No	VM0038 states other GHGs are not applicable
	EV battery storage in vehicle	CO_2	Yes	Main emission source
		CH_4	No	VM0038 allows exclusion for simplicity
		N_2O	No	VM0038 allows exclusion for simplicity
		Other	No	VM0038 states other GHGs are not applicable

Project Charging Diagram



The project boundary includes GHG emissions from grid electricity generation. The project boundary for the project fleet EVs' charging includes the EV itself in addition to the charging infrastructure. The charging data, including kWh, time of charge, and location, are collected from the EV on-board telematics.

3.4 Baseline Scenario

As stated in VM0038, the baseline scenario is the operation of comparable fleets (the comparability of baseline and project applicable fleet vehicles to be demonstrated as per indicators set out in applicability conditions, that would have been used to provide the same transportation service in the absence of the project.

3.5 Additionality

VM0038 uses an activity method for the demonstration of additionality. The boundary for this project is confined to the United States, which is listed as a country eligible for the positive list as cited in VCS Module VMD0049, *Activity Method for Determining Additionality of Electric Vehicle Charging Systems.* Because this project meets all of the applicability conditions under VM0038, the project can be considered additional.

3.6 Methodology Deviations

There are no methodology deviations.

4 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

4.1 Baseline Emissions

Baseline emissions are calculated as follows:

$$BE_y = \sum_{i,f} ED_{iy} * EF_{ify} * 100 * IR_i^{y-1} / (AFEC_{iy} * MPG_{iy})$$

Where:

BE_y = Baseline emissions in year *y* (tCO_2e)
$ED_{i,y}$ = Electricity delivered by project charging systems serving applicable fleet *i* in project year *y* (kwh)
$EF_{j,f,y}$ = Emission factor for the fossil fuel *f* used by comparable fleet vehicles *j* in year *y* (tCO_2e/gallon)
$IR_{i,}$ = Technology improvement rate factor for applicable fleet *i*
$AFEC_{i,y}$ = Weighted average electricity consumption per 100 miles rating for EVs in applicable fleet *i* in project year *y* (kwh/100 miles)
$MPG_{i,y}$ = Weighted average miles per gallon rating for the fossil fuel vehicles comparable to each EV in applicable fleet *i*, in project year y (miles per gallon)

For this project, BTR will not be using defaults for average electricity consumption per 100 miles or for miles per gallon, thus Equations 2 and 3 from VM0038 will be used in this Project Description as indicated below:

$$AFEC_{iy} = \sum_a (EV_{aiy} * EVR_{aiy}) / \sum_a EVR_{aiy}$$

Where:

$AFEC_{i,y}$ = Weighted average electricity consumption per 100 miles rating for EVs in applicable fleet *i* in project year *y* (kwh/100 miles)
$EV_{a,j,y}$ = Electricity consumption per 100 miles rating for model *a* EV in applicable fleet *i* in project year *y* (kwh/100 miles)
$EVR_{a,j,y}$ = Total number of model *a* EV in applicable fleet *i* on the road by project year *y* (cumulative number of EVs)

Miles per gallon for comparable ICE vehicles will be determined by:

$$MPG_{iy} = \sum_a (MGP_{aiy} * EVR_{aiy}) / \sum_a EVR_{aiy}$$

Where:

$MPG_{i,y}$ = Weighted average miles per gallon rating for fossil fuel vehicles comparable to each EV in applicable fleet *i* in project year *y* (miles per gallon)

$MPG_{a,j,y}$ = Mile per gallon rating for the fossil fuel vehicle model deemed comparable to each EV model a from applicable fleet *i* in project year *y* (miles/gallon)

$EVR_{a,i,y}$ = Total number of EV models within applicable fleet *i* on the road by project year y (cumulative number of EVs)

4.2 Project Emissions

Given that BTR will have the ability to track the GHG emissions intensity of all local and regional grids in the US, BTR will use Equation 5 in VM0038, and not Equation 4, to determine project emissions. In addition, this data will not use fuel consumption-based time-of-day calculations, so Equation 6 in VM0038 will not be utilized. Finally, the project will not be using chargers connected to batteries or on-site renewables (or any other associated infrastructure as defined in the methodology), and thus Equations 7-9 will not need to be considered in the project emission calculations. Thus, overall project emissions will be determined by:

$$PE_y = \sum_{ijt} ECTOD_{ijty} * EFkwTOD_{ijty}$$

Where

PE_y = Project emissions in year *y* (tCO_2e)

$ECTOD_{i,j,t,y}$ = Electricity consumed by project chargers sourced from region *j* serving applicable fleet *i* during time of day period *t* in project year *y* (kwh/time period *t*)

$EFkwTOD_{j,,j,t,y}$ = Emission factor for the electricity sourced from region *j* consumed by project chargers serving applicable fleet *i* during time of day period *t* in year *y* (tCO_2e/kwh)

4.3 Leakage

According to VM0038, "Leakage is not considered an issue under this methodology and is therefore set at zero."

4.4 Net GHG Emission Reductions and Removals

$$ER_y = (BE_y - PE_y - LE_y) * D_y$$

Where:

ER_y = Net GHG emissions reductions and removals in year *y* (tCO_2e)

BE_y = Baseline emissions in year *y* (tCO_2e)

PE_y = Project emissions in year *y* (tCO_2e)

LE_y = Leakage in year *y* (tCO_2e)

D_y = Discount factor to be applied in year *y* (%)

In addition:

$$D_y = ERC_y/(ERF_y + ERC_y)$$

Where:

D_y = Discount factor to be applied in year *y* (%)

ERC_y = Sum of GHG credits[20] issued by all projects under this methodology (or others which support the introduction of EV charging systems) across this project's applicable fleet *i* categories within this total project region in project year y-1 (tCO_2e)

ERF_y = Sum of GHG credits issued by all projects under methodologies which support the introduction of EV fleets (e.g., CDM AMS.III.C) located within this project's total region

Upon the writing of this PD, 5,277 VERs have been issued under VM0038 in the US. No other registries have EV projects listed in the US and thus it can be concluded that D=1.

Year	Estimated baseline emissions or removals (tCO_2e)	Estimated project emissions or removals (tCO_2e)	Estimated leakage emissions (tCO_2e)	Estimated net GHG emission reductions or removals (tCO_2e)
2022	629	248	0	382
2023	11,162	4,394	0	6,768
2024	37,182	14,637	0	22,545
2025	121,106	47,675	0	73,431
2026	249,957	98,399	0	151,558
2027	429,794	169,195	0	260,599
2028	572,625	225,422	0	347,203
2029	729,739	287,273	0	442,467
2030	902,564	355,308	0	547,257
2031	1,083,077	426,369	0	656,708

Total	4,137,836	1,628,920	0	**2,508,916**

5 MONITORING

5.1 Data and Parameters Available at Validation

.

Data / Parameter	IR_i
Data unit	Number
Description	Technology improvement factor for applicable fleet i in year y for default value BE calculations
Source of data	CDM AMS-III.C which uses the same discount rate in baseline calculations
Value applied	If baselines are calculated using updated BEy parameters for each project year y, $IR_i = 1$ If default values are used for these BEy parameter calculations, For LDV applicable fleets, $IR_i = 1$ For HDV applicable fleets, $IR_i = 0.9$
Justification of choice of data or description of measurement methods and procedures applied	See VM0038
Purpose of Data	Calculation of baseline emissions
Comments	Provide any additional comments

5.2 Data and Parameters Monitored

Data / Parameter	$EF_{j,f,y}$
Data unit	tCO2e/gallon
Description	Emission factor for the fossil fuel f used by the fossil fuel ICE vehicles deemed comparable to each EV in applicable fleet i in year
Source of data	EPA, see: https://www.epa.gov/sites/production/files/2015-11/documents/emission-factors_nov_2015.pdf

Description of measurement methods and procedures to be applied	N/A – US EPA reference materials used
Frequency of monitoring/recording	Whenever figures are updated
Value applied	L1/L2 (BEV and PHEV average) = 0.0088 tCO2 or 0.0088 tCO2e per gallon
Monitoring equipment	N/A
QA/QC procedures to be applied	During each verification, BTR will check to see if US EPA data has been updated.
Purpose of data	Calculation of baseline emissions
Calculation method	N/A
Comments	

Data / Parameter	EV_{aiy} *(Note that BTR will be calculating $AFEC_{iy}$ using Equation 2 and thus $AFEC_{iy}$ will not be listed as its own monitoring table since EV_{aiy} and EVR_{aiy} will be used to determine $AFEC_{iy}$).*
Data unit	kwh/100 miles
Description	Electricity kwh consumption per 100 miles rating for EV model a within applicable fleet *i* in project year *y*
Source of data	US DOE Fuel Economy program. See: https://www.fueleconomy.gov/feg/evsbs.shtml
Description of measurement methods and procedures to be applied	N/A – US EPA reference materials used
Frequency of monitoring/recording	Whenever figures are updated
Value applied	Will vary
Monitoring equipment	N/A
QA/QC procedures to be applied	During each verification, BTR will check to see if data has been updated.

Purpose of data	Calculation of baseline emissions
Calculation method	N/A.
Comments	

Data / Parameter	EVR_{aiy}
Data unit	Cumulative number of EVs
Description	Total number of EV model *a* within applicable fleet *i* on the road by project year *y*
Source of data	Argonne National Laboratory's monthly email update. See: https://www.fueleconomy.gov/feg/pdfs/guides/FEG2016.pdf
Description of measurement methods and procedures to be applied	N/A – US government reference materials used
Frequency of monitoring/recording	Whenever figures are updated
Value applied	Will vary
Monitoring equipment	N/A
QA/QC procedures to be applied	During each verification, BTR will check to see if data has been updated.
Purpose of data	Calculation of baseline emissions
Calculation method	N/A
Comments	

Data / Parameter	$MPG_{a,i,y}$ *Note that BTR will not use defaults for MPG_{iy} and thus will not include MPG_{iy} as a separate monitoring table.*
Data unit	miles/gallon
Description	Mile per gallon rating for fossil fuel vehicle model(s) deemed comparable to EV model a from applicable fleet i in project year y

Source of data	Use values from credible national government sources such as the US rating found in the 2016 Fuel Economy Guide
Description of measurement methods and procedures to be applied	N/A – US government reference materials used
Frequency of monitoring/recording	Whenever figures are updated
Value applied	Will vary
Monitoring equipment	N/A
QA/QC procedures to be applied	During each verification, BTR will check to see if data has been updated.
Purpose of data	Calculation of baseline emissions
Calculation method	N/A
Comments	

Data / Parameter	$ED_{i,y}$
Data unit	Kwh/year
Description	Quantity of electricity delivered to EV's by project chargers serving applicable fleet i in project year y
Source of data	BTR and OEM via OEM's telematic devices on-board each EV.
Description of measurement methods and procedures to be applied	On-board telematics will be used to determine the number of kWhs delivered to the EV within the project boundary for each charging event. The OEMs will collect this and provide the data to BTR.
Frequency of monitoring/recording	Continuous
Value applied	Will vary
Monitoring equipment	On-board telematic systems provided by the OEMs.
QA/QC procedures to be applied	Outlier data can be flagged if anomalous readings take place, which can be further investigated (eg: if a charging event leads to more kWhs dispensed than the EV's battery can hold. OEM telematics will be able to catch any errors in data processing.

Purpose of data	Calculation of baseline emissions
Calculation method	N/A
Comments	

Data / Parameter	$ECTOD_{i,j,t,y}$
Data unit	Kwh/time period t
Description	Quantity of electricity consumed by project chargers sourced from region j serving applicable fleet i during time of day period t in project year y
Source of data	BTR and OEM via OEM's telematic devices on-board each EV.
Description of measurement methods and procedures to be applied	On-board telematics will be used to determine the number of kWhs delivered to the EV within the project boundary for each charging event. The OEMs will track this and provide the data to BTR.
Frequency of monitoring/recording	Continuous
Value applied	Will vary
Monitoring equipment	On-board telematic systems provided by the OEMs.
QA/QC procedures to be applied	Outlier data can be flagged if anomalous readings take place, which can be further investigated (eg: if a charging event leads to more kWhs dispensed than the EV's battery can hold). BTR's platform will flag any apparent errors in data processing.
Purpose of data	Calculation of project emissions
Calculation method	N/A
Comments	

Data / Parameter	$EFkwTOD_{j,j,t,y}$
Data unit	tCO2e/kwh

Description	Emission factor for the electricity sourced from region j consumed by project chargers serving applicable fleet i during time of day period t in year y
Source of data	US EPA eGrid database or comparable data provider
Description of measurement methods and procedures to be applied	N/A
Frequency of monitoring/recording	Continuous
Value applied	Will Vary
Monitoring equipment	N/A
QA/QC procedures to be applied	N/A
Purpose of data	Calculation of project emissions
Calculation method	N/A
Comments	

Data / Parameter	ERF_y *Note that this parameter and ERC_y are used to calculate D_y, and thus, D_y will not be added as a separate monitoring table*
Data unit	tCO2e
Description	Sum of GHG credits issued by all projects under methodologies which support the introduction of EV fleets (e.g., CDM AMS.III.C) within this project's same total region where the applicable fleet *i* categories are the same for both this EV charging system project and projects introducing EV fleets, in project year y-1
Source of data	VCS (and other voluntary and regulated credit registries if they develop similar EV charging system methodologies), with GHG credits issued from EV charging system projects within this same project's region (e.g. for complementary charging networks).
Description of measurement methods and procedures to be applied	Simple tallies of the total GHG credits issued for projects that introduce EV fleets within this project's region from project year 1 through year y-1 These GHG credits are those issued under EV fleet methodologies such as CDM AMS-III.C whose credit potentially double count with those issued through EV charging system projects where the

	applicable fleet of the EV charging system project include those that were introduced in the EV fleet project.
Frequency of monitoring/recording	Annual
Value applied	Will vary by year. At the time of validation, 5,277 VCUs have been issued under VM0038 in the US. No other registries have EV projects listed in the US and thus it can be concluded that D=1.
Monitoring equipment	N/A
QA/QC procedures to be applied	N/A
Purpose of data	Calculation of emission reductions
Calculation method	*N/A*
Comments	

Data / Parameter	ERC_y *Note that this parameter and ERF_y are used to calculate D_y, and thus, D_y will not be added as a separate monitoring table*
Data unit	tCO2e
Description	Sum of GHG credits issued by all projects under this methodology (or others which support the introduction of EV charging systems) across this project's applicable fleet *i* categories within this total project region in project year y-1
Source of data	VCS (and other voluntary and regulated credit registries if they develop similar EV charging system methodologies), with GHG credits issued from EV charging system projects within this same project's region (e.g. for complementary charging networks).
Description of measurement methods and procedures to be applied	Simple tallies of the total GHG credits issued from EV charging system project year 1 through year y-1 within this project's region These GHG credits include those issued under this VCS charging system methodology (or similar ones developed by other certification groups) whose credits arise within the same region as this project but cover credits issued from complementary charging network systems (e.g. workplace chargers from a complementary project located in the same region as this project's residential chargers).

Frequency of monitoring/recording	Annual
Value applied	Will vary by year. At the time of validation, 5,277 VCUs have been issued under VM0038 in the US. No other registries have EV projects listed in the US and thus it can be concluded that D=1.
Monitoring equipment	N/A
QA/QC procedures to be applied	N/A
Purpose of data	Calculation of emission reductions
Calculation method	*N/A*
Comments	

5.3 Monitoring Plan

All monitoring and measurement will be carried out by BTR, in cooperation with the EV OEMs and with the assistance of Carbonomics, LLC. Data collected as part of the monitoring and verifications will be archived electronically and kept by BTR for at least two years after the end of the last project crediting period.

The data will consist of the following:

- List of EVs sold by the EV OEMs that are part of the grouped project managed by BTR. This list will be continuously updated. For privacy reasons, a unique identifier will be provided by the EV OEM to BTR for each EV that will not include any identifying information such as owner name, address, or the full VIN. An updated list of EVs that come into the project boundary will be provided to the VVB during each verification.
- Charging Events: Charging event data is collected remotely by the EV OEMs from the EVs in the project via EV on board telematics data, which is then provided by the EV OEMs to BTR. Each time an EV included in the project boundary is charged, BTR will first determine if that charging event is located in a state with a CFP (e.g. California, Washington, and Oregon) and if it occurred at any charging station within the project boundary that is listed on the US DOE's Alternative Fuels Data Center list of EV Chargers or is already participating in VM0038. These charging events will be excluded from crediting. BTR will maintain a continuously updated list of chargers from the US DOE, and if there is any doubt or uncertainty, the charging event will be excluded from crediting.

Each *eligible* charging event will be recorded in the BTR database and include the number of kWhs put into the EV.

- Grid Carbon Intensity: For each recorded and eligible charging event, BTR will refer to the EPA's eGrid or comparable data provider which will provide the average kgCO2/kWh of the local/regional grid at the time of the charging event. The database will thus record the project emissions in terms of kWhs * relevant grid emissions factor for that event.
- Baseline data: For each EV in the project boundary, BTR will also record the type of ICE vehicle displaced and, for example, the US EPA rated MPGs for that type of vehicle.
- Charging Data Feedback: The carbon intensity of each charging event by the project EVs will be communicated back to the EV OEM and ultimately to each EVand its driver. BTR and the EV OEMs will also communicate the optimal times for charging EVs with the goal of encouraging a shift in charging to that time, thereby maximizing the emissions reductions associated with charging each EV.

All of this data will be archived and made available to the VVB.

Bridge To Renewables, Inc. (BTR) Overview

BTR's mission is to help maximize the environmental benefits of EV adoption. Founded in 2015 and headquartered in Washington, DC, BTR provides and industry-leading platform – BTR's Bridge – that enables EV OEMs, charging station networks, and renewable electricity generators to work together to reduce GHG emissions and to participate in Low-Carbon or Clean Fuels programs (CFPs).

BTR was an early innovator in establishing the use of embedded vehicle telematics as a source of measurable and verifiable EV charging data used for transportation fuel programs Our Bridge platform collects and processes EV charging and renewable electricity generation data. BTR manages clean fuels program registration, reporting and credit monetization for our clients. BTR serves a dozen EV OEMs, one of the largest charging station networks in the US, and an array of renewable electricity generators to participate in programs such as California's Low Carbon Fuel Standard.

BTR's team is organized into three overlapping functions: a technology function, which is responsible for data collection and handling; a program management function, which is responsible for data filtering, analysis and reporting; and a commercial function which is responsible for client management and credit monetization.

BTR's objectives are to make recurring registration and reporting processes both systematic and transparent. We achieve this through building robust integrations between vehicle telematics data and our Bridge platform to automate its collection, processing, filtering and reporting. As part of the filtering process for residential charging credits under existing Clean Fuels Programs, BTR is required to remove all charging events located within a certain distance from a registered charging station to avoid double-claiming of credits.

BTR incorporates stringent data handling, protection and storage protocols that often are required by both state regulation and state law.