

Guidance for Determining Activity Penetration of Electric Vehicle Charging Systems in New Regions and Updating the VCS Activity Method Module

The following documentation represents the approach taken and guidance followed to assess the inclusion or exclusion of regions in vs 1 of the EV Charging module. Where new regions would like to be added to his module in the future, this paper may inform developers' efforts. This guidance provides one credible approach to support developers' objectives. Other approaches may also be acceptable.

Every five years, the EV Charging Module's Activity Method market penetration rates must be updated. Project developers may also bring forward regions not currently covered on the positive list for inclusion. This memo provides guidance for how these tasks are to be completed, based upon the approach followed when the methodology was first approved and published and draws upon key equations, definitions and references found in *EV Charging Systems Activity Method Additionality Module*

For project developers seeking to include new regions in the positive list, VCS has confirmed that, in parallel with seeking project validation, project developers may present data confirming that the relevant project region' EV market share is below five percent to the same VVB conducting their project validation. A streamlined review of the EV charging module is anticipated enabling the new region to be included in the positive list and the project validated with the same single VVB.

Whether updating the EV Market Share, EV Market Share Proxy and EV HDV Market Share data for regions every five years or seeking to confirm a new region's status relative to these same parameters, the following guidance should be followed:

1) Conducting Regional Tests for Inclusion in the Positive List

Whether updating all existing regions' status under VCS's periodic positive list update requirements or seeking to include new regions, validators will follow the following guidance:

- Analyze the underlying factors (socio-economic etc) in the region to be listed as they relate to additionality and baseline scenarios in order to assess whether there are significant variances in these factors that would likely lead to EV Market Share penetration results of considerable variance within the region.
 - Traditionally, VCS has found low variability in such factors at the country level when establishing Activity Method positive lists. When the EV Charging Methodology was first published, an in-depth case study was conducted in the US, where EV incentives varied by state, to evaluate whether resulting EV Market Shares by state and local CBSA regions were markedly influenced by such incentives. All EV market share results at these US sub-region and local levels were well below five percent and variances were not significant. (See module Appendix A for in-depth case study)
 - This variance analysis is based upon Sections 4.3.9 and 4.6.9 of the VCS Standard:

- The applicability conditions shall establish the scope of validity of the methodology, including the geographic scope. In establishing the scope of validity of the methodology, the methodology shall clearly demonstrate that there is similarity across the sub-areas of the geographic scope in factors such as socio-economic conditions, climatic conditions, energy prices, raw material availability and electricity grid emission factors, as such factors relate to the baseline scenario and additionality. It may be necessary to limit the applicability of the methodology to comply with this requirement.
 - The maximum adoption potential is the total adoption of a project activity that could currently be achieved given current resource availability, technological capability, level of service, implementation potential, total demand, market access and other relevant factors within the methodology's applicable geographically defined market.
- Where variances in such factors or incentives are considered within sub-regions or local regions of a country to be potentially salient, EV Market Share results are to be analyzed respectively for such a sub-regions and/or local regions.
 - Following the approach laid out in Appendix A for the US in-depth case study
 - In the US case analysis, project region eligibility, when chargers are serving LDV's, was considered on a national, sub-regional (state) and local regional (CBSA ¹) basis. For chargers serving US HDV vehicle charging, project region eligibility was considered on a national and sub-regional basis.
 - The smallest regions examined were consistent with the typical range for LDV and HDV EV's. For the US, the smallest regions for LDV's will be the CBSA; for HDV's the state.
 - The size of the minimum region to be assessed, should such variances be considered salient, will take into account the EV ranges typically driven so that this is consistent with the size of region tested. Thus, for the US, the smallest local region for LDV's would be the CBSA, the metro area which is comparable to the typical daily US commuting distances. Zip codes and cities were considered too small given typical LDV driving ranges. Similarly, for HDV EV's, in the US the state will be the minimum level since both e-truck operators and e-bus/transit agencies serve regions spanning multiple cities and CBSA's
 - When such variances are applicable, regions shall be differentiated from the more local to national taking into account the inclusion of smaller regions in a positive list (see below) if there are found to be variances in the underlying factors between such smaller regions of a country (as above).

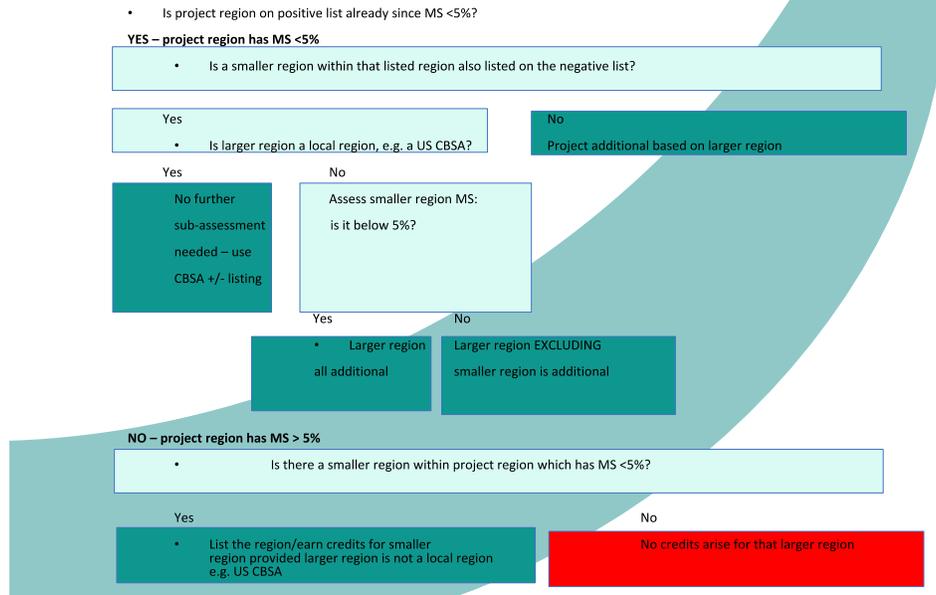
¹ The CBSA metro area is consistent with typical EV driving ranges

- If a sub-regional or local region analysis is conducted, consistent with the questions analyzed in the US case study, the analysis will examine whether significant variances in EV Market Share results might arise where:
 - A larger region's market share was above five percent (and so would not be included in this module's positive list), but smaller regions' EV market share penetration rates were still below five percent and thus such smaller regions would still be included on the positive list. Projects will then earn credits within the smaller region's domain.
 - A smaller region's market share penetration rate was over five percent but the larger region's market share was still below five percent, whereupon the larger region would be listed on the positive list and the smaller region would be cited on the module's negative list. Projects will then earn credits for areas it covers except for those within the smaller region's domain.
- Ineligible regions (national, sub-regional or local), whose EV Market Share exceeds five percent, are to be listed on the Module's "excluded" negative list while noting that smaller regions can still be listed on the positive while a larger region within which they are located is listed on the excluded negative list. Conversely, smaller regions can also be listed on the negative list while larger regions within which they are located are also listed on the positive list.
 - Thus if a region is to be listed on the negative list, reviews may be conducted for related smaller/larger regions to confirm their potential inclusion on the positive list. For example:
 - A smaller region can be listed on the positive list if its penetration rate is below five percent even whilst the national and/or for LDV's, sub-region within which the smaller region is contained are listed on the negative list because their EV market share exceeds five percent
 - The converse also applies:
 - A smaller region can be listed on the negative list if its penetration rate exceeds five percent even whilst the national and/or, for LDV's, sub-region's EV market share penetration does not exceed five percent and is therefore still listed on the positive list
- Project validation will then be made in ways which exclude chargers from negative listed regions while still including chargers for regions which are confirmed on the positive list. Charging systems located in any such ineligible regions (whose market share penetration rate exceeded five percent) would then have been excluded from a project's eligible charging system inventory, without adversely impacting the additionality standing of the project's remaining charging systems.
 - As a result, for example in the US, if nationally it still had an EV market share below five percent and a sub-region state such as California (CA) had been

found to have an EV market share over five percent whilst CBSA regions in California still had EV market share below five percent, the US and the qualifying CA CBSA regions would have then been designated on the positive list and the state of California included on the negative list in the module. In such a case, a new project (when applying such a combined set of positive and negative listed regions) would still have been considered additional for chargers located in the US outside CA and within the CA CBSA regions since these were on the positive list; only chargers located in the other parts of California would have been excluded.

- Thus the additionality standing of an excluded region does not affect the additionality standing of other larger or smaller related regions provided they have an EV market share of below five percent. Any such project charging systems excluded from the positive list test in this way (and thus listed on the negative list because their EV market share was above five percent) would nonetheless have been able to seek inclusion in the project using the Step 3 project testing (see Section 7, *Electric Vehicle Charging Systems, v1.0*).
 - A project must thus confirm that its applicable regions are not already listed in the “negative list”, whose regions have already been confirmed as having exceeded a five percent EV market share penetration
- The following “cascade” was used during the US pilot case study to evaluate project regions’ inclusion based upon their EV Market Share results (recognizing that at some point there may be national, sub-regional and local region EV market share results that could simultaneously be above and below five percent in different regions). The cascade helps determine which project regions are then included as additional given a combination of positive and negative listed results within the project boundary.

Cascade Flow Diagram



- If during a module update, national, sub-regional or local regions pertaining to a project which has already been validated earlier (under a previous positive list) are subsequently included on the negative list, this does not affect the additional standing of the project which was validated using an earlier positive list.
- A region's inclusion in the positive list will be determined based on the EV Market Share results for the project's applicable fleets in a given region as the governing, determinative metric (based upon vehicles on the road).
 - In some regions, information is more readily accessed using the EV market share proxy determined by sales (i.e., EVs sold in a given year as a percentage of total vehicle sales). The EV market share proxy determined by sales is a conservative alternative test for the EV market share penetration test, which is the determinative applicability condition for a region to pass the activity penetration positive list.
 - As a result, for a region's inclusion in the positive list Equation 1 in Appendix A must be satisfied, applying the EV Market Share metric. If Equation 2 is satisfied for a given country or region, using the EV Market Share Proxy metric, Equation 1 will be deemed to have been satisfied for that country or region. Equation 1, EV Market Share, is thus governs and is determinative.
- Assessment of a region's inclusion in the positive list as outlined above will be made separately for all of a project's relevant applicable fleets' (e.g. BEV/PHEV for L1/L2, BEV

for DCFC, e-bus and e-truck for HDV) market share penetration assessments, consistent with this guidance and the procedures given in Appendix A

- For LDV's, validators may choose to only provide EV Market Share Proxy results if these are below five percent since they are deemed as satisfying the EV Market Share requirement given in Equation 1
- For the HDV sector, e-bus and e-truck HDV EV market penetration rates will be calculated separately given, in the US case example, the rather higher penetration rates for e-buses (of 0.03% in the US versus 0.006% of e-trucks).
- The list of geographic regions currently tested as having satisfied the EV market share five percent penetration requirements is found in the positive list, given in EV Charging Systems Activity Method Additionality Module vs 1.0. If a project's region is not already included in this positive list, projects may use the project testing additionality evaluation (step 3 section 7, *Electric Vehicle Charging Systems, v1.0*) or revise the module to include such a new region in the positive list, by applying the procedures found in this Appendix B guidance document.

2) Data Sources Required

To compile such EV Market Share, EV Market Share Proxy and HDV EV Market Share statistics, both for future VCS module updates and to establish a new region's potential admission to the Test 2 positive list, developers will draw upon data which:

- Relies upon credible government, quasi-government or independent national/regional sources
 - e.g. for the US, data from IHS Markit, state DMV data, DoE Factsheets, DoT sources, independent sources such as the FleetCarma and non-profit ICCT reports which themselves use IHS Markit data
 - e.g. for international sources the EIA Global EV Outlook, official government statistics such as Statistics Norway.
 - e.g. for HDV sectors, the IHS Markit MDV/HDV and the APTA databases
- For regions already included in a positive list, where possible, retain consistent sources to those previously used and/or, for new data sources, demonstrates consistency of results for historical periods

3) Data Sources

Data sources used to date for projects serving LDVs, per Appendix A include:

- National level EV Market Share Proxy data has been found in the EIA EV Global Outlook and individual governmental sources for higher penetration rate countries such as Norway².

² <https://www.ssb.no/en/transport-og-reiseliv/statistikker/bilreg/aar/2016-03-30>

- For the US for individual states, EV Market Share data has been found at ZEVFACTS.com³ for both BEV and PHEV fleets, independently, providing the ability to calculate penetration rates for both L1/L2 and DCFC BEV/PHEV and BEV applicable fleets.
- For Canada, FleetCarma which uses the IHS Markit data as primary sources⁴
- For US states, if this data is not available, EV Market Share Proxy by state has been sourced via the Argonne National Lab monthly EV statistic publications (circulated by email).
- For US local regions, CBSA EV Market Share penetration rates have been found via IHS Markit data subscriptions⁵. In future other sources could include DMV data sources (which is typically accessed upon request)
 - In this module edition, IHS Markit subscription was used to determine the CBSA EV Market Share penetration results for the US. See Appendix C, Table Y below.

Data sources used to date for projects serving HDV vehicles, per Appendix A, include:

- IHS Markit subscription results for US e bus and e-truck MDV/HDV's,

APTA database statistics detailing the number of e-buses operated by US transit bus agencies alongside other non-EV buses in their fleet.

³ *This source draws upon the IHS Markit Insight data*

⁴ <http://www.fleetcarma.com/ev-sales-canada-2016-final/> referencing the company which IHS Markit acquired, R. L. Polk & Company

⁵ Permissible and accessed under an organization's private IHS data subscription